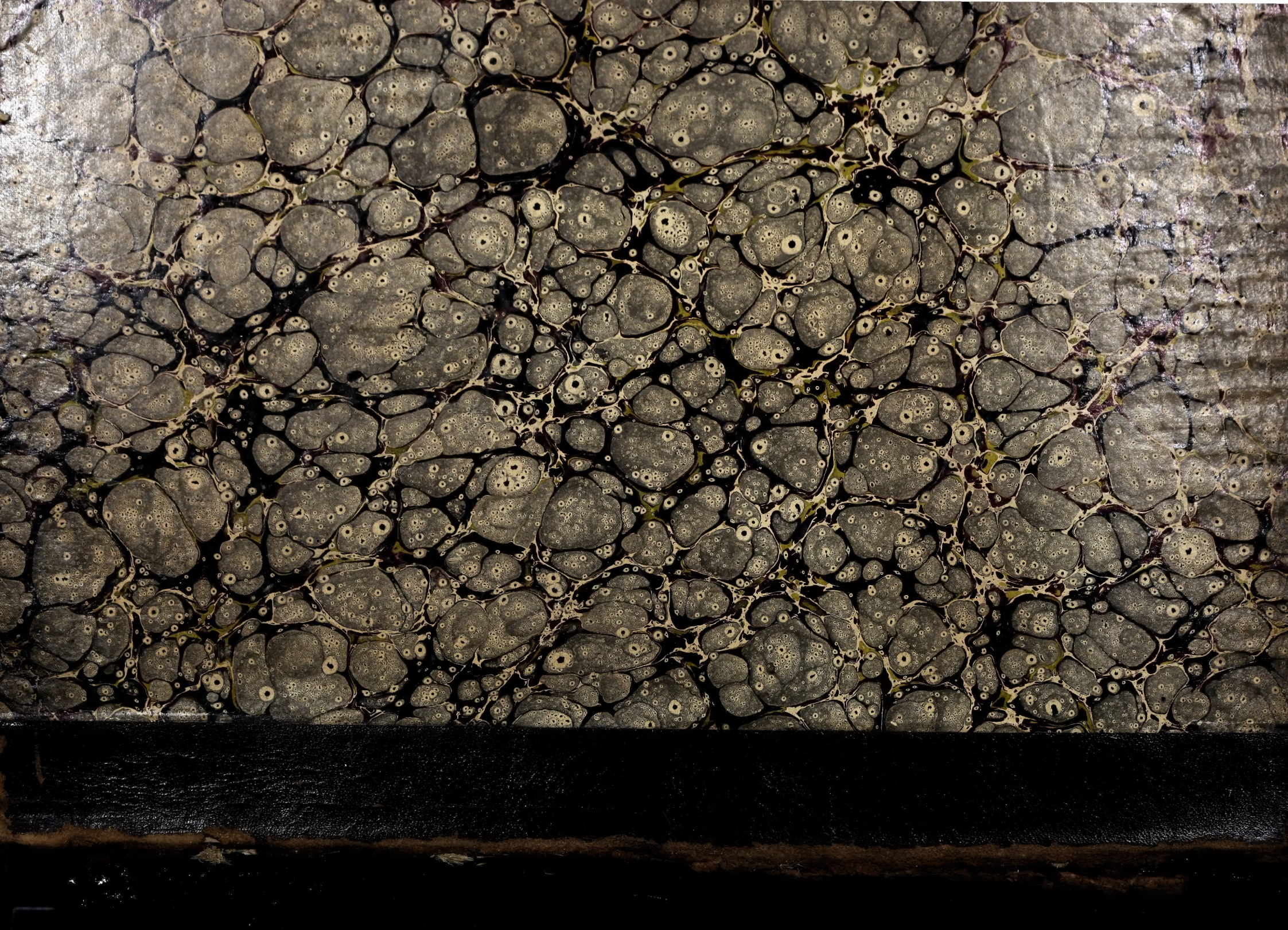


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TELESCOPIC EFFECT WITH ORDINARY LENSES.

In the belief that the subject will prove of interest to more than one, we here reprint some queries contained in a letter received from Mr. H. F. Manteau, of East-street, Indianapolis, U. S. A. He asks :—

"1. What is the *exact* equivalent focus of a photographic lens in millimetres that will give a picture with its proper perspective values which is just *within* producing a telescopic effect?

"2. When a photographic lens of the 'symmetrical type' gives a distance of exactly 200 millimetres from the ground glass to the centre of the diaphragm when objects at an infinite distance are precisely in focus, what is the equivalent focus of that lens?

"3. Of a like lens of 400 millimetres' focus?

"4. If I have constructed to order two symmetrical lenses, each of 400 millimetres' focus, one of 12·5 millimetres' clear aperture, and one of 50 millimetres' clear aperture, and use each of them with diaphragm No. 512—other than a greater light power in that of 50 millimetres' diameter—what will be its superiority, and will that one of the lesser diameter be in any way better?

"5. If two photographic lenses have each a focus of 400 millimetres, one with an angular aperture of 25 degrees and the other 100 degrees, what will be their respective qualities?

"This is a subject of most serious and earnest inquiry with myself, preceding the placing of special orders with the most skilful opticians; consequently I will feel very much indebted to you for thorough instruction."

If Mr. Manteau will permit us, we shall prefer to employ the English inch instead of the French millimetre as our standard of measurement, inasmuch as it is more familiar to the majority of readers. Besides, it is quite easy to convert one into the other.

It is not possible to say definitely what focus of lens will produce an image exactly bordering upon producing a telescopic effect. This depends upon the vision of the individual who examines the image produced by photography. The range of distinct minimum vision—that is, the distance at which he will hold a photograph from the eye when examining it—differs with the ocular powers of each observer. Some with eyes normal for distance will find the distance of ten inches between the eye and the object to best fulfil the conditions for the comfortable examination of such object; while others, more especially as their years advance, find fourteen, seventeen, or twenty inches requisite. With short-sighted people the distance is reduced ten inches. This forms an all-important factor in the determination of the question as to the production of a picture having telescopic effect.

But assuming average vision—neither long nor short—we are able to say, from experiments made for the purpose, that a lens of fifteen inches' focus will make a photograph which, when viewed at an average distance from the eye, shall subtend an angle similar to that of nature. This is demonstrable by taking a negative with a lens of the focus mentioned, and making from it a thin transparency by *superposition*. Now, standing so as to face the subject, and on the spot occupied by the camera when the negative was taken, interpose the transparency between the eye and the scene. The distance between the eye and the transparency, when the latter is found to coincide with the subjects in the scene, will be that at which the details of the picture can be observed with comfort, and which we would call an average distance. By employing a lens of longer focus, it will be evident that the "telescopic effect" alluded to will be produced.

The second and third of the above series of queries seemingly answer themselves; but we remark that the real focus of a symmetrical combination must be measured from the nodal, or Gauss point, which is practically situated midway between the lenses; and, as the diaphragm is also placed there, the distance between the ground glass and the diaphragm may be assumed as the focus of the lens. This Gauss point may, by the separation of the lens, be brought much nearer to the front element than the back one, and *vice versâ;* but experienced opticians find that the best average results are produced by their lenses of this class when the separation is such as to cause the nodal points to meet at equidistance between the components of the objective.

With regard to the remaining queries—of two well-made lenses of equal foci, but the clear aperture of one exceeding that of the other in the ratio of four to one (=50 millimetres to 12·5 millimetres), we should unhesitatingly prefer that with the larger angular aperture, as, when occasion required, it would work sixteen times quicker than the other. It would then be a racehorse as compared with the other. But, if both are diaphragmed down to the same aperture, they would give similar pictures and work with equal rapidity, subject to a theoretical difference of one probably having thicker lenses than the other, which with the fine colourless glass now employed by the best opticians would prove a theory *quite* undiscoverable in practice. In the last-mentioned case, if the respective apertures are squared, the resultant figures will, when compared, show at a glance how much quicker (or slower) one lens will be as contrasted with the other. It goes without saying that the greater is the angular aperture of a lens the less power of penetration, or depth of definition, it possesses.

ELECTRO PHOTOGRAVURE.

Intaglio photographic engraving appears, just now, to be receiving more attention on the part of amateurs than, perhaps, all the other mechanical processes put together, and it must be

admitted that the subject is a most seductive one, when once it is taken up by the experimentalist. The method most generally in favour seems to be the etching one—that usually termed the Klic, or Talbot Klic, process. The process is an excellent one, and, as most of our readers know, consists in first forming an etching ground with bitumen, or resin, on a copper plate, and on that producing a negative by the carbon process. The plate is then etched through the image with a solution of perchloride of iron, the varying thickness of the gelatine forming the picture regulating the depth of the etching according to the different tones of the picture.

The system, as just remarked, is the one that amateurs seem to be devoting their attention almost exclusively to, and quite neglecting another method that is capable of yielding results which are equally as good, some say better. We allude to what is commonly known as the depositing method, in which the copper plate is formed by the electro deposition of the metal on a gelatine relief. At one time electrotyping was a very favourite pastime, with those of scientific tastes, for reproducing medals, casts, leaves, and the like. Then complete outfits for the work were as common in scientific instrument stores as complete sets of photographic apparatus now are. Indeed, it may be said that photography, as a scientific amusement, has superseded electrotyping. Seeing all this, it is a little surprising that the two processes combined have not been more taken up by amateur photographic engravers, for obtaining intaglio plates. In proof of the value of this system, it may be mentioned that, till recently, all the finest photogravures made in France were produced by the electrotype method, and a very large proportion of the best of them still are.

One of the chief essentials in a photogravure plate, by whatever process it is made, is the grain. In the so-called Klic process this is obtained by the etching ground, in the electro process it is obtained by granularity imparted to the surface of the gelatine relief. There are different ways by which this can be done. They may be classed as chemical and mechanical. The former is obtained by a modification in the gelatine which is to form the image, or by modifying it afterwards. The grain obtained in either way is a species of reticulation similar to that seen in a collotype print, and known familiarly as the collotype grain. This grain possesses advantages over some others, inasmuch as it is a discriminating one. It is coarser and more open in the shadows than it is in the more delicate tints, while it is very fine or almost absent in the high lights. It is, however, not a very good ink-holding grain.

The mechanical grain more closely resembles that seen in an etched plate; but, as a rule, it is of a more discriminating character. It is coarser in the deepest shadows than it is in the middle tints, which is a decided advantage. To obtain a suitable chemical grain with certainty requires considerable experience, therefore we would suggest that the experimentalist who takes up the electro method should confine his attention at first to the mechanical one.

One of the late Mr. W. B. Woodbury's methods, and it is said to be that which is so successfully worked by a well-known French house, is to make a "carbon" tissue containing a quantity of gritty matter, such as emery or pumice powder. Then, when the image is developed, not only has it relief, but also the necessary granular surface composed of the gritty particles. From this grained relief, after drying, an impression in soft metal is taken by pressure or by electrotyping. This process, however, is scarcely likely to find much favour with amateur workers, inasmuch as it involves making the tissue for oneself. The process that will adapt itself best to the amateur's requirements is what is known as the Waterhouse process, and that is simplicity itself.

A carbon print, in ordinary tissue, from a *negative*, is developed on a polished copper plate, just in the same manner as one is from a transparency in the etching process, except that there is no etching ground on the plate. When the plate has drained well, it is dusted over with a gritty matter, such as powdered glass, emery, or sand. This adheres to the soft gelatine image in proportion to its thickness. In the lights where there is no gelatine there will be no adhesion, and in the more delicate portions very little; and so on, in proportion, to the deepest shadows, where the gelatine is thickest. As the film dries and contracts, the particles seem to be drawn deeper into the gelatine, and so produce a sharper and still more decided grain. When the film is dry, the gritty particles are removed by gently brushing or washing them away. To enable this to be accomplished, the powder is, in the first instance, treated with stearine or beeswax. In place of using glass or sand as the grain-forming medium, Mr. E. W. Foxlee substituted powdered resin, and, instead of removing it by mechanical means, he dissolves it away with a solvent of the particular resins employed. By this modification, it is said, a sharper and crisper grain was secured.

It should have been mentioned that, after the image was developed, the plate should be immersed for a short time in a weak solution of bichromate of potash before the gritty matter, whatever it may be, is applied. Also, before it is removed, it should be exposed to light to render the film more completely insoluble, so that it is the better able to withstand the sulphate-of-copper solution while being electrotyped. When the relief is finished, it only remains to blacklead it, and make an electrotype from it in the ordinary way. This, when thick enough, forms the printing plate.

Space will not here permit of dealing with the electrotyping part of the subject, but we will, however, say that, in blackleading the relief, only the best kind of plumbago should be employed, so as to obtain a uniform deposit of copper as quickly as possible.

THE WET-COLLODION PROCESS.

IV.—The Silver Bath.

This has always formed the *bête noir* of the operator in collodion, and yet it need not be so. A clever photographer who puts himself to the trouble of acquiring a knowledge of its principles of action is rarely troubled by its getting out of order, or at any loss to correct it if it does.

The formation of the silver bath is one of the simplest feats known in chemistry. It suffices to dissolve nitrate of silver in distilled water in the proportion of from thirty to forty grains of the salt to each ounce of water. If a lightly iodised collodion is employed, then will a thirty-grain bath prove amply sufficient; but for such a bromo-iodised collodion as that for which we gave a formula in last chapter we would advise a thirty-five grain bath, the reason being that, the greater the quantity of bromide in the collodion, the stronger should the bath be. As soon as the nitrate of silver has dissolved, the bath is ready for use, subject to one thing.

When in solution, silver nitrate has the property of dissolving silver iodide to a small extent; and it is desirable, previously to commencing work, that this tendency be overcome by satu-

rating it with the iodide. We have known some of the most whimsical schemes conceivable proposed for effecting this simple end; but the readiest, and one which cannot possibly fail, is this:—

Procure a glass vertical dipping bath with a glass dipper, and fill it four-fifths full with the silver solution; now collodionise a levelled plate of glass by pouring a small pool of collodion in the centre, and, gently tilting it to make it flow evenly from corner to corner, drain the surplus back into the bottle, place it on the dipper, and lower it into the bath. It immediately acquires a yellow opalescence, which is at its maximum after the plate has been in the silver bath for about two minutes. At this stage it could be placed in the dark slide and impressed with an image in the camera, but this is not our intention just at present. By allowing the plate to remain in the solution for a few hours, but not less than half an hour at any rate, the bath, which first formed the iodide, is found to have redissolved much of it, and the plate, so recently opalescent, is now nearly clear again, probably in patches, from the nitrate bath having eaten up its own offspring. It only does this once; hence, after this has taken place, the preparation of the nitrate bath is completed.

Another method of iodising the bath consists in dissolving the silver in about one half the water decided upon, and to this adding a few drops of a strong solution of iodide of potassium. This will immediately cause a formation of iodide of silver that, by shaking, will be redissolved by the strong nitrate solution. The remainder of the water is then added, by which the surplus iodide will be precipitated, for the weaker the silver solution the less iodide is it capable of holding in solution. After having been filtered, the bath is ready for use.

The bath is usually considered to be in the best condition for working when, on being tested with litmus paper, it is found to have a slightly acid reaction. If the litmus remains unchanged, which will be the case if the silver solution is alkaline or neutral, nitric acid diluted with distilled water must be cautiously added until the litmus paper becomes reddened.

To coat a plate with collodion hold it level, either by finger and thumb at one corner if it be a small one, or on a pneumatic holder if large. The collodion must be poured on the centre and made to flow to each corner. This can be done with readiness and certainty if the operator remains quite cool and avoids getting flurried. It is best done when the collodion is in a moderately wide-mouthed bottle with a turnover lip; a wide mouth also facilitates the draining back from the plate of the surplus collodion. The film sets rapidly, and when, by touching with the point of the finger, this is found to be the case, the plate is placed upon the dipper and immersed in the silver bath by a steady, unbroken downward motion. If a halt be made when immersing it, this will show in the finished negative as a line across the plate. After remaining in the bath for about two minutes, the plate should be lifted up to see if there are any greasy-looking markings on the surface of the collodion. If so, reimmerse it and give a few movements sideways. This will effect the removal of these ether marks, and ensure the equal union of the silver bath with the non-sensitive surface.

A flat porcelain or glass dish will answer as well as a vertical bath for sensitising the plate. In this case the plate must be raised for examination by a hook made of silver wire or vulcanite. Avoid the use of the fingers, gutta percha, or a hook made of base metal for this purpose, for the first will ensure their being badly stained, the second may introduce organic matter in the bath, and the third will cause a precipitation of silver. Baths of gutta percha were much used at one time, but we strongly urge the avoidance of this, for, sooner or later, it will exercise a deleterious influence upon the silver solution, and cause the plates to fog, even although it has been previously rinsed out with nitric acid, and even coated with varnish afterwards. Gutta-percha baths are greatly to blame for many difficulties encountered by amateurs in practising wet collodion.

After draining the plate for a few seconds, it is ready for exposure in the camera. It is somewhat difficult to convey an idea of its sensitiveness. Although much less sensitive than gelatine dry plates, it is sufficiently so for obtaining full exposures by a drop shutter on a bright summer day, if the lens is not stopped down.

THE PROPER USE OF METOL.

An article in our Almanac, by Mr. F. C. Beach, of New York, on the subject of the metol developer strikes the key-note to the elucidation of the mystery of its successful use. So far as its properties are concerned, it has been recognised by many capable operators as the nearest approach yet to pyro as an "all-round" developer, some going so far as to claim for it actual superiority. But it has its peculiarities, or, at any rate, it possesses properties which at times make it appear to behave in an erratic manner, although, as we shall endeavour to show, possibly, when we understand it better, these apparent irregularities will disappear.

Undoubtedly, the instructions issued by the manufacturers for its use, and the formulæ they give, are open to a good deal of criticism, and require considerable amendment before we can hope to get the most out of metol, and it is with a view of pointing out the direction which the modifications should take that we pen the present article. For this purpose we need here only direct attention to the general rule laid down, that to secure softness the proportion of the reducing agents is to be increased, while to obtain the reverse condition, contrast or hardness, we are to increase the alkali.

Now, with pyro, the accepted rule has long been the very opposite to this, and practically the same may be said of both hydroquinone and eikonogen. To secure density we have to increase the proportion of pyro or other reducing agent which softens, and detail accrues from an increase of alkali. This, of course, can only be accepted as a general rule, because the proportion of restrainer used and other circumstances will naturally affect individual cases. However, the same general rule ought to prevail with metol as with the other substances named, or, if it does not, we should know the reason why.

In his Almanac article, Mr. Beach touches on one part of the reason of the difference between the behaviour of metol when used according to the published formulæ and that of pyro and other agents; and, in a leading article in our own columns on August 4, last year, we pointed out somewhat similarly that sulphite of soda is of at least as much importance as an active agent in development, in conjunction with metol, as is the alkali used. With amidol it is not only as important, but more so—absolutely essential.

In the article referred to on "The Function of Sulphite of Soda in Development," it is shown that, whereas with pyro its chief uses are as a preservative of the solution, and a preventive of stains in the negative, in conjunction with the other

substances named, its services are not required for those purposes, although it remains an equally or even more essential constituent of the developer. It was shown that, taking metol as the reducing agent, sulphite proved a more energetic accelerator than ammonia; in other words, that metol and sulphite, without alkali, proved a better developer than metol and alkali without sulphite. With amidol the function of sulphite is even more important still, for, while in its presence, this developer acts most energetically in an acid condition; in its absence, alkali is almost useless.

The accuracy of these observations is fully borne out by the experiments of Mr. Beach, who emphasises the importance of simultaneously increasing the proportions of alkali and of sulphite. Now, applying these remarks to the published formulæ of the manufacturers of metol, what do we find? That in modifying the developer by the addition of more alkali—which with pyro would render it more energetic—we are actually reducing its strength all round by making it weaker in reducing power (metol), and weaker also in its principal accelerator (sulphite), although the comparatively feeble accelerator (alkali) may be slightly increased.

The fact that the whole of the sulphite used in the published formulæ is in combination with the metol seems to be, with this developer, altogether wrong in principle, and to account satisfactorily for the difference in its behaviour already referred to; for, in adding more alkali, instead of strengthening, we are really weakening it. If, however, an equal proportion of sulphite to that used with the metol were dissolved with the alkali, any addition of the latter to the developing solution already in use would leave it still in the same condition of strength as regards sulphite, and therefore in a position to profit independently by any accelerating action of the alkali on the one hand, or softening action from the reduction of the metol on the other. Probably, in fact, a plain, concentrated solution of sulphite of soda would prove a better accelerator than alkali alone.

But there is another direction in which the combination of alkali and sulphite affects the use of metol, and that is in the attainment of density. There have been loud complaints on this point, and we have ourselves on more than one occasion been inclined to attribute the fault to variations in the character or preparation of the metol itself. We have had reason quite recently, however, to lay the blame on to deterioration of the sample of sulphite of soda in use, a rather old one. A sample of undoubted integrity not being at the time available, a solution was made by passing sulphurous acid gas through a solution of sodium hydrate until it barely exhibited an alkaline reaction. The operation was roughly conducted, so that we were compelled afterwards to rely on tentative methods rather than on calculation.

Two portions of this solution were measured out, and in one metol was dissolved in the proportions given in the formulæ issued by the makers, and in the other sodium carbonate, also in the published proportions, while a third solution of sodium carbonate alone of the same strength was also made. Bromide of potassium was added in the same proportion or quantity to each of the two last solutions. These then represented metol and carbonate of soda in conjunction with fresh unoxidised sulphite and carbonate of soda alone.

Test plates similarly exposed were developed with the ordinary solutions previously in use, and with the new metol and plain carbonate of soda in combination. Result, the latter plate showed very much more strength and a longer range of gradation; but the result obtained with a similar exposure and the combination of carbonate and sulphite was still better, and, on repeating the trials several times, the exposures being made under a graduated screen, it was found that a better result was attained, both as regards density and gradation, with less than half the exposure when the alkali and sulphite were used in combination — or in other words, as Mr. Beach recommends, when the strength of the sulphite is kept up along with the increase of alkali.

The alteration in formulæ and working is but slight, but we are convinced that the gain in working will be found far more than worth the trouble, and will place metol on a firmer basis than it has previously occupied. Finally, we would suggest that those who have been complaining of want of density should examine their sulphite before condemning metol.

Silver and Gold in Solution.—The well-known purple of Cassius, an insoluble gold compound, or at least a somewhat similar salt, has been obtained in solution by Herr E. A. Schneider. He treats an alloy of gold, silver, and tin with concentrated nitric acid, and treats the resulting black powder with ammonia, thus obtaining a solution. By subjecting this to dialysis he gets rid of the ammonia and the gold purple remains in solution. Herr Schneider draws attention to chloride of silver which, with perchloride of iron solution, can be obtained in a soluble form. Whether any photographic value can be attached to these experiments remains to be seen.

Light-grasping Power of Large Objectives.—A paper was read by Mr. Dennis Taylor before the Royal Astronomical Society which has a tendency to upset a great many old notions upon the light-gathering power of the object-glass. Hitherto it has been accepted almost as an axiom that this power increases as the square of the aperture, but Mr. Taylor's investigations show this to be quite erroneous. With a given large aperture, the light-grasping power can be increased considerably by making the focal length greater. Indeed, he states that a smaller telescope of relatively larger focal length may actually excel in light-grasping power a telescope of larger aperture and shorter focal length.

Waste Light producing a Photographic Effect.—Mr. Taylor, referred to above, believes the increasing size of stars, with increasing exposure, may be explained as being the result of photographing the halo of wasted light which surrounds the real image. If further research corroborate this view, it is evident that more complete approach to achromatism may, or should, yet be reached. We may at this stage remark that a well-known contributor to these pages has expressed to us his opinion that a considerable proportion of the halation that, under certain conditions, is seen on any plate or film, is due to the only partial correction of some of the rays, the residual uncorrected cones of light, though very weak of themselves, serving to impress the plate when they fringe a brilliant object on a dark background.

The Photographic Club.—The *Annual Report of the Photographic Club for* 1893 has been published. It contains many interesting and instructive discussions on technical subjects that have taken place at the Club during the past year, and in which several well informed and esteemed photographic authorities have given their practical experiences and ideas. The Club meets every Wednesday evening, at eight o'clock, at Anderton's Hotel, Fleet-street, where it has most comfortable quarters, an admirable library, dark room, and other conveniences. One is always sure of spending a pleasant and profitable evening at the Club; and photographers—both professional and amateur—who desire such advantages, could not do better than apply for membership. The Club is now in the fourteenth year of its existence, and we heartily wish it continued prosperity and usefulness.

Shearing Stress upon Silver Salts.—Our readers will remember the discussion that took place upon the effect of shearing stress and the developable result obtained by its action. As to the actual cause of the molecular alteration which resulted in the mark where the pressure was applied being brought out by a pyro developer, no sufficient explanation was given. In the *American Journal of Science*, Mr. Carey Lea describes some experiments upon the decomposition of silver and other salts by the mere effect of shearing stress, which seems to throw an entirely new light upon the matter. The results he obtained are entirely novel and, as he shows in his paper, contrary to the theoretical views held by chemists in general. He quotes from one distinguished authority to show the prevailing belief on the subject. Briefly, he is able to convert mechanical force into chemical, and he conclusively shows that his results are not obtained in consequence of the heat engendered by the mechanical stress applied. First he decomposed his salts by actual pressure of high power; but eventually he found that the same result could be obtained by the simple process of triturating with a pestle and mortar. The shearing stress thus obtained by hand when the pestle was pressed hard during the rubbing was equal in effect to an immense force of simple direct pressure. As to the results, he found that, when silver chloride was sharply ground in a perfectly clean mortar for some time, both pestle and mortar became covered with a deep purple varnish of silver photochloride, thus indicating a partial reduction to subchloride. A small quantity only—a few grains—should be used, or the particles will roll over each other and defeat the stress action. Chloride of gold and sodium, corrosive sublimate, calomel, platinic chloride, silver tartrate, carbonate, citrate, oxalate, and other salts were easily blackened by this treatment without the intervention of any other chemical. He further shows how, after simply impregnating paper with these and other salts in solution and then thoroughly drying, visible results will be obtained by strong scraping pressure with the rounded end of a glass rod. There will then be no difficulty in seeing how any shearing action on the surface of a dry plate should render it liable to decomposition, and, once decomposed in the manner suggested, developing will follow. We apprehend these discoveries will have important application to many photographic problems.

PHOTO-MECHANICAL NOTES.

Photo-mechanical work seems to possess an intense fascination for photographers, both amateur and professional, just now. Ten years ago the number of firms engaged in this work could be reckoned on the fingers of one's hands; to-day they run at least into hundreds. As a fact, I know of a private list which has been compiled, comprising over five hundred addresses of persons who are either working or dabbling in some way in "process," and this must be far short of the actual number. A further indication of the amount of this sort of work that is being done may be gathered when I mention that the leading firm in the photo-zincograph business employs about sixty hands, who are almost continuously working overtime. The firm in question has, moreover, just made extensive additions to their premises, which will lead to an increase in the number of their workpeople. Several other firms employ not far short of this staff, and some are also extending their studios.

It may seem paradoxical, after indicating such an apparently prosperous state of things, to advise photographers to look very carefully into things before they take a leap into the "process" business. There may be "money in it," but there is keen competition in this, as in every other line. New firms are starting up almost every week, and one robs another of work by cutting prices. The cost of production, unless very carefully managed, runs the turnover very close. Workmen command high wages, plant and materials are expensive for the most part, and there is some amount of uncertainty about the work, leading to waste of time and material.

The year that has just ended has seen a marvellous advance in "half-tone" photo-zinco work, which is the best paying line of all the photo-mechanical processes so long as the existing prices of the best firms can be maintained. The progress in this process is chiefly due to the high standard of perfection to which the manufacture of screens has been brought. Those of Max Levy still stand unrivalled, though many attempts have been made, both in this country and abroad, to imitate them. As much as 500*l.* was spent by one enthusiastic experimenter living not one hundred miles from London in trying to equal the American productions, but the only "show" for his money the gentleman in question can point to is a very elaborate automatic machine for ruling the plates, but which has not turned out any screens that can be compared to the original thing.

It is generally believed that cross-lined American screens consist of two single-lined plates cemented together, but this is a mistaken idea. Levy rules both ways on one plate, and the other plate, which is sealed to it, is merely a cover glass for protection. Wolfe, in his collodion copies, which are produced by contact printing, makes a double exposure of a single-lined original to secure the cross lines on one plate, and he likewise seals the screen to a plain cover glass. It may be mentioned, by the way, that xylol is the best solvent of Canada balsam for such hermetical sealing. Most of the experimenters in screen-making by the engraving method encounter a difficulty in filling in the lines with the opaque substance. Stiff printing ink usually comes in most handy for the purpose, but it is difficult to get sufficient in to form a rich black line, and, moreover, the solvent of the Canada balsam dissolves the ink. Levy's filling is not soluble in either benzole, turps, or xylol, and neither strong acids nor caustic alkalies have any effect on it, but it is slightly acted upon by methylated alcohol. Hence it may be concluded that it is some form of lacquer, but how this is filled in so neatly is a problem, though I am inclined to think it is done by smearing the whole surface of the plate, and, when dry, grinding down by some glass-polishing method, until the parts which are intended to remain transparent are clear. It seems to be forgotten, however, by experimenters in screen-making that Levy holds a patent in this country for his productions.

For one's own use the making of screens is a game "not worth the candle." Far more will be spent in experimenting than a decent screen ready for use will cost. As to the merits of the two leading makes, Levy's and Wolfe's, there is much difference of opinion amongst practical workers. It is claimed that the Wolfe screen, being a collodion copy, and therefore not absolutely opaque in its lines, tends to soften the picture, and helps the necessary diffusion of dots which form the image on the half tone negative. Theoretically, this may seem very plausible, but in practice I do not think there is anything to beat the Levy screen. The latter has perfectly opaque lines with perfectly clear glass spaces, and consequently must give cleaner work, which will be more readily etched, and if in exposure the screen is placed the correct distance from the sensitive plate, the necessary diffusion of the dots is readily attained, without any greater exposure than is required by the Wolfe screen.

The phrase "diffusion of the dots" which I have made use of in the preceding paragraph may not convey any meaning to the lay mind, but it is perfectly well understood by the operator in half-tone work. To understand it better I will ask my readers to take a piece of perforated zinc, the coarser the better, and project a shadow of it upon a sheet of white paper. It will be noted that, when quite close to the paper, the shadow gives the perforations as sharp white dots, but as the zinc is moved further away the white dots become more and more blurred until they completely reverse themselves and appear as black dots with white intersections. It is obvious that the light passing through the screen acts on the sensitive plate in similar way, and, as it is necessary that there should be this diffusion to get the best effect, the bit of perforated zinc teaches a very useful lesson.

Wm. Gamble.

THE LUMIERE-VALENTA-LIPPMANN COLOUR PHOTOGRAPHS.

[Photographic Society of Great Britain.]

The photographs of coloured objects made by the original Lippmann process showed certain grave defects, such as colours which were metallic, changeable, and unnatural, and in some cases not even confined to the coloured objects themselves, but spread over objects that were uncoloured in the originals. The whites were also rendered more like black than the darkest shadows. Nevertheless, Alphonse Berget and other French writers, ignoring all these facts, asserted that they were successful reproductions of the objects photographed, and conclusive proofs of the truth of Lippmann's theory. The facts having become known, the statement, made last year, that by a modification of the process M. L. Lumière had produced results free from all of these defects, was, I believe, generally discredited. Thanks to Mr. Warnerke, who secured the loan of some of the Lumière photo-

graphs for exhibition at the Photographic Congress, we now know that some really pleasing colour photographs have actually been produced, and that, under certain conditions of illumination, they render the whites and blacks correctly. But there is one thing which we do not know, and which we must find out, before we are in a position to estimate the possible value of the process, and to know how much of Lumière's success is due to the attempt to carry out Lippmann's theory, and how much to accident.

Are the Results due to Reversal?

We do not know whether the "whites" in these photographs are due to the reflection of light from interference laminæ within the film, in accordance with Lippmann's theory, or whether they are nothing more than the normal reflection from the surface of the glass and gelatine film. Lippmann's theory, as I understand it, calls for a different series of laminæ within the film for every wave-length of light, amounting, where white light acts, to over 30,000 laminæ within a space no thicker than a single wave-length of red light. Although open to conviction, I have not been able to believe in the possibility of producing such a deposit by development in a gelatine-bromide film, and some time before I saw the Lumière photographs I expressed the belief that, if the lantern projections showed "whites," these whites were neither more nor less than the normal reflection from the surface of the gelatine-coated glass. This belief was confirmed by an examination of the Lumière photographs, and I believe I have collected sufficient evidence in its support to justify me in raising the question in such a manner as will be likely to lead to an investigation that will establish the facts.

According to Lippmann's theory, the photographic images should be negative, the greatest number of laminæ and the greatest opacity in the high lights, and no deposit at all in the deepest shadows. Lippmann's own photographs of objects showed the greatest opacity in the high lights, but only as a matt deposit, which by reflection at the critical angle appeared black. The Lumière photographs, on the other hand, have the appearance, by ordinary reflection, not of negatives, but of positives; the high lights look like clear glass, and the deepest shadows show a dense matt deposit, which has the same appearance by reflection at the critical angle as the "high lights" in the Lippmann photographs. The greatest amount of light reflected from these photographs at the critical angle not only comes from the part which looks like clear glass, but, according to such estimate as I have been able to make, even this amount, which makes the whites of the picture, is only equal to the reflection from a black glass, or the surface of the gelatine film itself. The shadows appear black, not because there is no deposit there, but because the glass is obscured by a deposit so thick and matt that it scatters the light striking upon it, instead of reflecting it all in one direction.

The facts which I have stated raise the question whether the rendering of whites and blacks in the Lumière photographs is not due to the long exposure producing a reversal of the image, so that there is a clear film in the high lights where white light has acted, and the densest deposit where only the scattered light in the camera has acted.

The Lumiere Results inconsistent with Lippmann's Theory.

If this question is answered in the affirmative, it appears to me to follow that the action which renders the light and shade is of a distinctly different character from that which produces the colours, that the simultaneous production of light, and shade, and colour depends upon so regulating the conditions that these two distinct kinds of action proceed together in the same sensitive film and with the same rapidity, and that the Lumière process is, therefore, essentially a composite one, which is neither indicated by, nor consistent with, Lippmann's theory, and must be regarded as to a large degree an accidental discovery.

Other questions present themselves. If the whites are not, and cannot be, produced in accordance with Lippmann's theory, what proof have we that the colours themselves are due to such a series of laminæ as the theory calls for? Cannot every colour shown in the Lumière photographs be reproduced by means of a single interference film of varying thickness, backed up or broken by a granular deposit of varying density, and have we anything more than this in the Lumière photographs? Has not the attempt to prove one theory given us results which we require a greatly modified theory to explain?

Valenta's Results.

It is impossible to prove anything by such observations as I have made. We must at least know how the Lumière photographs are mounted. It has been asserted that they are mounted under a shallow prism, and Herr Valenta recently assured me that he believed they were mounted under such a prism, which was cemented to the photograph with Canada balsam. I have since assured myself, by experiments with Lippmann spectra, which Herr Valenta made and presented to me, that the colours are certainly more brilliant and more nearly correct when covered in this way and also backed with Brunswick black, so that the only light reflected to the eye comes from the interference film or laminæ of the photograph. It is evident that they ought to be mounted in this way, in order to avoid degradation of the colours by admixture of the white light of ordinary surface reflections. If the Lumière photographs are mounted in this way, then the whites of the pictures must be due to reflection from something within the film, and my theory is a wrong one; but I doubt very much if they are mounted in this way. I think that, instead of being covered by a prism, they may be covered by a piece of ordinary crystal plate glass, mounted at an angle with the face of the photograph, in order that the reflection of light from the cover shall be at a different angle from the reflection from the photograph itself.

If the pictures are mounted as I suppose, then the normal surface reflection from the gelatine-coated glass should be sufficient to make the whites seen in the Lumière projections, provided that the image has been reversed by the long exposure, in the manner which I have indicated, and that the colours themselves are not disproportionately bright. In the Lippmann photographs which I have seen, and in the Valenta spectra, the normal surface reflection from the glass would not appear white in comparison with the colours, because the colours themselves are too brilliant; but given a shorter exposure, producing an interference film that reflects less colour, and we may have something like the results seen in the Lumière photographs.

The Lumière photographs are known to have been obtained with sensitive films made according to a formula only slightly modified from one previously published by Herr Valenta. It is, therefore, interesting to see in the photographic spectra, presented to me by Herr Valenta exactly such a reversal of the image as I thought I saw evidence of in the Lumière photographs, although not so complete, probably because the action was everywhere by coloured rays instead of white light, and the sensitive film thicker than on the Lumière plates, which were coated with a whirler.

Such of Valenta's spectrum photographs as have been made with correct exposure, on plates sensitised with cyanine, imitate very well indeed all the spectrum colours, when they are backed with Brunswick black, and cemented to a shallow prism. Not so the photographs made on plates differently prepared. One example imitated all of the colours of the spectrum in a space which had only been acted upon by the rays ranging from yellow to blue-green. This photograph, I was informed, was made on a chloro-bromide plate, sensitised with eosine. Although the result was said to be "abnormal"—both Herr Valenta and Dr. Eder took particular pains to impress that fact upon my mind—it affords sufficient proof that such photographs may show most brilliant colouring, which is nowhere like the colouring of the objects photographed. This example was also interesting as showing a far more complete reversal of the image than either of the two which I possess.

The Colours not Pure.

The example I have just described, by proving that red may be produced in such a photograph by the action of yellow rays, and blue and violet by green rays, seems to me to prove also that the colours are not in any case produced by series of laminæ within the film, separated by the wave-lengths of the light acting, but only by something practically equivalent to a single interference film, the thickness and consequent colour of which depends upon favourable conditions largely, but not altogether, upon the colour of the light acting. A spectroscopical examination of one of Valenta's spectrum photographs, when backed with Brunswick black, and cemented to a shallow prism, to do away with surface reflections, also appears to support this view, by showing that none of the colours are pure; most of them are made up of a considerable part of the spectrum, crossed by dark bands, such as appear in the spectrum of ordinary thin film interference colours. The fact that the colours of a soap bubble, due to a single interference film, may be projected even more brilliantly, with the same arrangement, than the Lumière photographs, also supports this view.

The red of one of Valenta's spectrum photographs proves by spectroscopical examination to be a mixture of nearly all kinds of spectrum rays except a band in the green. The orange-yellow is a mixture of the deep red, orange, yellow-green, and green-blue rays. The greenish yellow is a mixture of the deepest red, the yellow, and the green-blue rays. The green is a mixture of the deepest red, the

orange, green and green-blue rays. The greenish blue is a mixture of the orange-red, yellow, bluish-green, and blue rays. The blue is a mixture of orange-red, greenish yellow, blue-green, and blue. The violet is a mixture of deepest red, orange-yellow, green, blue, and violet. The second example is considerably better than the first, and in both examples the colours appear approximately correct even in the spectroscope when the test is made with a comparatively weak light. I suspect that the colours may be feebler but purer (as in the Lumière photographs?) when the sensitive film is spread with a whirler, and is consequently both thinner and evener than in these examples; and I question whether substantial accuracy in the reproduction of mixed colours, if possible, is not dependent upon the employment of a sensitive film scarcely thicker than a single wavelength of red light.

Any process which does not actually reproduce, but only approximately imitates, pure spectrum colours, cannot, of course, give physically accurate reproductions of mixed colours; and, if the ordinary light and shade of the photograph is not due to reflection from the same kind of photographic deposit that renders the colours, the problem is evidently a complicated and puzzling one.

The Projection System Employed at the Society of Arts.

In order to give an ocular demonstration of the fact that the reflection from a clear gelatine film on glass would be sufficient to make the "whites" of the Lumière projections, I should require an electric arc light and apparatus like that used for projecting the Lumière photographs at the Photographic Congress. This could not be provided without a great deal of trouble, and I must be content with a simple calculation. Nearly all of the light of the lantern which is available for ordinary lantern-slide projection was concentrated upon the Lumière photographs, and as much of this as they would reflect passed to the screen through an objective having a larger clear aperture than the extreme area of the photographs. The amount of light that reached the screen was only sufficient to make a really brilliant picture of about two feet in diameter. If the same amount of light had been reflected by a silvered mirror through an ordinary lantern slide, it would certainly have been sufficient to make a brilliant projection of at least fifteen feet in diameter, or over fifty times the area. One surface of a gelatine-coated glass will reflect into the objective nearly one-twentieth of the light incident at the same angle, and, therefore, more than is required to make such whites as were shown.

One gentleman with whom I have discussed this subject, and who has had considerable experience with electric light projection, estimated that the Lumière projections were as brilliant as if the whites in the photograph had consisted of ordinary white paper. I do not think his estimate was very far wrong, but he did not know, and could not readily believe, that under the conditions that existed in the projection of the Lumière photographs a piece of black polished glass, one of the blackest objects known, would appear as white (on the screen) as a piece of dead white paper, one of the whitest objects known.

Altogether, my observations lead me to believe that the results shown in the Lumière photographs are not obtained in strict accordance with Lippmann's theory; that the process is essentially a composite one, the production of light and shade being due to action of a distinctly different character from that producing colours; that the results are at present more or less accidental; that successful working conditions cannot be calculated on the basis of present theory and known facts, but must be arrived at, if at all, by purely empirical experiment, unless we can find a new and truer theory to guide us.

The most important question which I raise can be answered by an explanation of the way in which the Lumière photographs are mounted, and it seems rather odd that information of this character has so far been withheld.

F. E. Ives.

CARBON PRINTING.

This process seems to be coming to the front again a little more of late, and I am surprised to see it stated by good photographers that they find a difficulty in getting vigorous prints from good negatives, and have to abandon its use from dissatisfaction at results.

I have been using the Autotype carbon process by "double-transfer" for the past five years, and find it so satisfactory that I have abandoned all other printing methods, and I regret that I did not take it up earlier, and so spared myself the trouble of producing so many perishable prints by the various silver processes.

I consider it established that no other printing process can *excel* carbon in the delicate gradation and range of tones produced from any good negative, and that it is well adapted to render the true effect shown by all classes of negatives, whether they be soft and delicate or strong and plucky in their contrasts, and that it is an error to suppose that to obtain successful results it is *necessary* to have negatives of a vigorous character, and brilliant contrast of light and shade.

One of the technical characteristics of the carbon tissue image is that where brilliant high-lights come in *close contact* with strong shadows, there is a tendency for the *soft* gelatine image to break up under development, and tear the lights and shades away from each other, and so spoil the print, and I find the best effects are obtainable when the gradations of tone are more gradual, and that moderately soft negatives, full of half tone, yield the finest results and are the easiest to manage.

In any printing process the negatives of finest *quality* will always yield the finest prints, and carbon is no exception to the rule, but I believe that no other process so well serves the printer in obtaining satisfactory prints from all classes of negatives, from thin and soft to bold and vigorous. It is entirely a question of *accuracy of exposure* of the tissue under the negative, and then of development in water of a suitable degree of temperature.

If my experience may be of any service to other workers, I would like to say that there appear to be three chief factors in the successful working of carbon prints—viz., Condition of tissue, Exposure in printing, and Development—and, if these are properly attended to, it ought to be perfectly easy to produce good prints.

Condition of tissue.—My experience is chiefly confined to that made by the Autotype Company, of Ealing Dene. I have tried tissues made by other firms, but they have not suited me so well, from proving much slower in speed of printing. The Autotype tissue is made in a variety of shades of colour, but only three tints are obtainable as *regular daily or weekly commercial article of supply*, and are known as "engraving black," "standard brown," and "sepia" (so called, but not a true sepia in tone, being a "hotter" tint closely imitating "vandyke brown" in shade).

These tissues are obtainable freshly made and ready sensitised twice a week, and to the amateur printer it is a most important and exceedingly convenient matter to be able to obtain tissue, cut into flat pieces of any size, ready to go at once into the printiug frame, and have them delivered at one's residence in almost perfect condition for use. I say almost perfect as it will print well when received, but it appears to be about at its best working quality in one to three days afterwards.

If I am correctly informed, the Autotype Company's tissue is not sensitised by immersion in a solution of bichromate, but the salt is added to the coloured emulsion before it is spread upon the paper support, and, therefore, may differ in printing effect from tissue stored in the sheet and sensitised by immersion as wanted for use; but it is a great advantage in dull weather, such as we are now having, to obtain tissue which is fully three times as rapid as that of other makers. It means great saving of time, or the comfortable production of three times as many prints in a given period of available leisure to the amateur, who must snatch a precious hour from the middle of the day, to get his tissue exposed, set aside, and developed in the evening, which is my only available method of working.

With this bi-weekly supply of tissue, it is easy to calculate how much to order at once, and how to use it up, as it should be procured only in such quantity that it can be worked off in a week's time from delivery, then it is at its best in point of speed and quality.

"Stale" tissue is a nuisance to work, in spite of the Editor's dictum that it tends to produce greater vigour if worked in that condition with hotter water. Theoretically it may be so, but practically it brings with it a variety of inconveniences, of which one of the chief is *insolubility* of the *edges* and *refusal to strip* from the "support" without tearing up the film.

If it is seen that insolubility of edge is commencing, the sooner that batch of tissue is used up the better. The use of hotter water to complete solution of stale tissue may be necessary, but is dangerous, and is likely to result in a crop of very minute blisters, similar to those experienced sometimes by printers on albumenised silver paper, and such prints are rarely presentable, and not worth the trouble of developing and finishing off. Therefore, the first factor towards success is *freshly made tissue, used up between the ages of three and eight days.*

Exposure.—The *most important* factor is accuracy of exposure in the printing frame. There being no visible image the sole guide is the actinometer, but it is infallible if strictly watched and attended to. The first print of any negative must be entirely guesswork, though experience may give a very accurate guess, and a first print

will often prove a success and an encouragement to the printer; but a print once made, and the actinometer "tint" carefully noted down, each succeeding print ought to become a certainty. Carelessness in exposure will not do; much greater care must be used than in any other printing process; if strict accuracy is observed all will go well; but over-exposure is the one difficult and disagreeable thing to deal with in carbon printing. A properly exposed piece of tissue "strips" pleasantly, dissolves off readily, and the high-lights come up purely white and brilliant with very moderate soaking and washing off in hot water. Any degree of over-exposure requires three or four times the soaking and washing, hotter water, and very probably reticulation of the film, and blisters. Therefore, when you have once timed the exposure correctly for any negative mark the actinometer tint needed on the back (rebate edge) of the glass plate with a writing diamond, and it will always be there as a guide in any future printing from it. Printing is best done in shaded diffused light, well open to the sky overhead; the time required with autotype tissue is usually about one-third that for making a print on albumenised paper, particularly if the light is dull and overcast, and fifteen to twenty minutes I find a fair average time required. This rate of speed will be appreciated by those whose time is precious during daylight, and who have no assistants to take the duty off their hands.

Development.—It is a fatal error to use very hot water to save time; the half tones and high lights are likely to suffer. It may be necessary occasionally to contend with degress of over-exposure, but, if exposure is correctly attended to, a temperature of water from 95° to 100° Fahr. is better than either lower or higher. In case of suspected under-exposure, cooler water may save a print, but I do not find that there is so much latitude in development as has been stated by some exponents of the process, and under-exposed prints are defective ones, and over-exposed ones the same, only "more so," and in both cases should be destroyed. One or two other points are worth naming. It is recommended to put a "safe edge" on the *negative* by running a strip of black varnish or black paper round the back edges of the glass to cover the rebate space of clear glass. This is a disagreeable process, and disfigures the negative, and may be avoided in the following way:—I use a printing frame somewhat larger than the negative, say, for a whole plate, use a 10 × 8 frame. Put a sheet of clean glass in the bed of frame first, then take a card of the same size, and cut out of it a space into which the negative will just fit. It acts as a "cell" to keep the negative in its place. On the *back* of this "cell" gum some strips of black paper, just wide enough to cover the rebate marks on the negative without infringing on the view. These strips act in exactly the same way as a varnished "safe edge," and can be used for every negative of the same size, is always ready for use, is much cleaner and pleasanter to deal with, and will serve for hundreds of negatives.

Surface of Prints.—There is an increasing taste amongst photographers for prints with a "matt" surface, and it is a feature of carbon printing that a "face" of any desired brilliancy, or of matt quality, can be readily obtained, according to the material used as a "temporary support" for development. The simplest form of print is that by "single transfer" from a "reversed" or "stripped" negative, when the natural semi-glaze of the gelatine is left as the surface of print. The highest possible "enamelled" surface is got by using collodionised plate glass as support by double transfer, and I think is highly objectionable. But, if a *perfect matt surface* is desired, the tissue should be developed on "smoothed opal" glass, when the result will rival, or excel, that of finest platinotype printing, and the glass plate is a very firm and pleasant support to work upon. Celluloid sheets are supplied by the Autotype Company, but, though light and convenient to handle, there is a risk of becoming scratched in use, and every atom of defect of such a surface is accurately reproduced in the finished print.

If these remarks may tend to assist any would-be carbon worker in getting better results, I shall be gratified. GEORGE BANKART.

THE PHOTOGRAPHIC REPRODUCTION OF PAINTINGS.

THERE are few photographers who, at some time or other, have not been requested to copy an oil painting, and, I may add, few that, setting aside the solatium in the shape of £ *s.d.*, have not wished that oil painting had never been painted.

I allude especially to those photographers who run a general business, portraits chiefly, with odd jobs of different classes occasionally thrown in. Nothing in the whole round of photographic work is more tantalising than having to copy a large old oil painting, between times, so to say, in an ordinary portrait studio, for, of all processes more than others, that of copying oil paintings requires a special form of studio and special lighting to get the best results with a minimum of worry. The maximum of trouble is involved when working, as indicated, in the usual portrait glass room. To make even a presentable copy of a difficult subject necessitates a general upset of the place; blinds that answered very well for portraits are no good, or worse than useless; furniture, fittings, screens, and reflectors are all in the way, and must be cleared out; in fact, there is a cussedness about the whole job that is excessively irritating, that is, if one tries conscientiously to get as good a result as possible. But much of this work is performed in a very indifferent manner, owing chiefly to the outside difficulties that surround it—comprised in the complete modification of studio arrangements and light. The time occupied in getting the painting suitably fixed and protected from improper light—on a day with intermittent gleams of sunshine—is a thing to be remembered, and, unless the size of the picture is small, and therefore fairly manageable, it is somewhat doubtful if we get the best result with all our trouble.

Let us now see what we can do in the matter. A day is appointed when ordinary business is expected to be slack, and, with a great deal of manœuvring a large old painting on a heavy stretcher is brought into the studio. As a preliminary canter, one corner is sent through the roof. After this *contretemps*, the painting is safely set against the studio wall, nearly touching the glass with the two top corners; it is then found that the canvas requires tightening; the picture is moved, the necessary strain given by driving in the keys with a hammer. It is now fixed in position, and the following trouble presents itself. A 12 × 10 plate, the largest we work, will not be large enough, so it must be taken on two plates and joined. The first thing is to get the camera the proper distance from the picture; then stretch a cord tightly across the room to a nail on each side, perfectly parallel with the base of the picture, as a guide for the camera; then raise the lens *exactly central with one half* of the picture, which may be temporarily divided by a piece of white tape stretched from the top edge, to be, of course, removed before exposure.

Now comes the most difficult part—so curtaining the room that there shall be no improper reflection from any part of the half of the picture about to be operated on. It is almost always necessary to hang up a dark curtain straight across the room over the camera in order to cut off any direct front light. Place the eyes as near as possible in the position of the lens, and carefully examine the picture for reflections. If there are any, and it is almost certain there will be, cut off the light that produces them. Finally, look on the camera screen and see that the whole thing is properly square and true with the frame of the ground glass. A small plate as a trial for exposure had better be taken first for economy's sake, then any alteration may be made on the larger plate if it has been found too much or too little. If it is an important job, it is best to take two plates of each half-picture. One half being taken, move the camera level with the centre of the other half, examine for reflections, and give the same exposure, or, I should better say, get the same exposure, as the light may have varied. In each half an inch or more of the *central* portion should be reproduced on each plate for the more easy joining up afterwards. A great advantage is sometimes gained by sponging the surface of the painting with old ale, glycerine and water, or diluted albumen; but this must be done with the *greatest circumspection*, and it must only be *just moistened*, not slopped on. It will remain moist during the copying, when it must afterwards be carefully removed by sponge and clean water, and dried with a soft cloth. This application makes the surface more even, and removes any sunk-in appearance.

In the foregoing we have supposed a case in which the lighting is not altogether under the control of the operator. When it is, it should be nearly as possible the same as that in which the picture was painted, and on no account should the picture be turned up to copy it, as under no conceivable circumstances would a picture be painted lighted from below, which would be the effect of turning a painting upside down. An alternative plan of copying a painting too large for the studio is by taking it off the stretcher and tacking each end to sufficiently long rollars, round which the canvas can be rolled. These can be fixed upright by any convenient device, and kept taut by laths nailed at each end of the rollers after sufficient of the canvas has been unrolled for copying, or this arrangement can be suspended from the roof. Much depends on the form of the glass room. If this plan is adopted, the camera remains unmoved during both exposures, and the lighting once right requires no further attention. It goes without saying that the suspended picture must be made to remain perfectly quiescent by cords or laths fastened to

the floor; it requires a certain amount of care and trouble, but, at any rate, provides a method of dealing with pictures that could not possibly be done on their original stretchers in the space at disposal.

Orthochromatic plates are invariably the best for picture-copying, and it is astonishing the excellent results that may be had from unpromising subjects by their use and the judicious selection of screens. At the same time they are far from being universally used, despite their advantages, in many studios. If ordinary plates are worked, it will be found an advantage to carefully cover the orange-yellows on the painting with a slight wash of *Naples* yellow water colour, and the blues with a thin wash of gamboge, which can be easily removed after the picture is photographed. Many of the excellent copies of pictures we see are from duplicates in monochrome; in fact, before the advent of orthochromatism, it was the usual plan adopted with any important modern picture intended for engraving, but less important works had to be carefully doctored by the photographer prior to copying. In the foregoing remarks we have alluded to large works. With *small* pictures the difficulty of properly lighting is infinitely less. They can be fixed on a head-rest and moved anywhere in the studio for a suitable light with a minimum of trouble. The same rules, however, apply as to reflection (as with the larger work), and to the relative positions of lens and picture.

With regard to exposure, it should always *be full*. Any under-exposed oil painting copy is bound to be a failure. Properly exposed, a normal developer will work well; and, if the subject is a trying one, consisting of much yellow and brown, a little extra pyro is an advantage, in fact, a stronger developer altogether may be used. Water-colour drawings are less troublesome than oil paintings to copy. There is less difficulty in avoiding reflections, but they cannot be doctored or manipulated in any way on the surface without danger of damaging them. The only way of treating them, orthochromatic plates not being available, is to place them behind thin glass, and put some thin washes of transparent colours on the glass, and a thin film of Naples yellow over the yellow and orange. A great improvement may be effected if this is properly managed.

EDWARD DUNMORE.

MESSRS. HURTER & DRIFFIELD'S PHOTO-CHEMICAL INVESTIGATIONS.

[Central Photographic Club.]

THE principal object of these investigations is thus stated by the authors in their original paper: "Our researches, which have covered a period of over ten years, were made with a view to rendering the production of perfect negatives as far as possible a matter of certainty." To this end it was necessary to ascertain the laws which govern the reduction of silver in a sensitive film, which has been exposed to light and afterwards developed. A great difficulty is, however, found at the outset, and is due to this fact, that, whilst there are two causes at work, light and development, there is but one effect, reduction of silver. For instance, it is quite easy to obtain the same amount of reduction in a film in different ways—a short exposure to a given source of light with long development, or a longer exposure with shorter time of development, or even the developer alone may slowly cause a reduction without any light action.

No single determination of the reduced silver can, therefore, be of any value, being a joint effect, but, if a series of different known exposures is made and developed together, the effect of development thus being constant throughout the series, the quantities of silver found must in some way indicate the action of light.

As the use of the reduced silver in varying quantities in a negative is to obstruct light in varying quantities also, when used for the production of a positive, the measurement of the proportion of light which passes is of importance, and when ascertained will also give the proportion which is absorbed, and thus becomes a measure of the amount of silver present.

The eye alone is quite unable to make any accurate estimate, being easily deceived by strong contrasts, and also unable to detect small ones. This deceptive power of contrast may be shown in various ways; for instance, taking a plate which has been exposed to light, and developed so as to obtain a dense fog all over, then by cutting away a portion of the film, so as to leave a small spot surrounded by bare glass, it will be found that the spot appears much darker than the general ground.

The Measurement of Silver Reduced by Light and Development.

The instrument devised for the purpose of measurement is the well-known Bunsen photometer, specially arranged to suit the peculiar requirements. Two powerful lamps are placed outside, one at each end, of a box, having small apertures in the ends, through which light is admitted and received upon opposite sides of a small piece of paper. The paper, upon which is a very small grease spot, is placed in a second small box, made to slide from end to end between the apertures in the outer box. If the light from the lamps is made equal, this spot will almost disappear when the paper is at equal distances from each lamp, whereas, in any other position, where the light is not equal, the grease spot will appear dark on the side most lighted, and light upon the other. Again, any difference in the light which enters through the apertures may be measured by the distance from the central point to which the paper has to be moved to restore the balance.

Two small mirrors are placed in the slide, which carries the paper so that both sides may be seen at once from the front of the instrument. If, when the light is equal at both ends and the paper in the central position, a plate, with some reduced silver upon it, is placed over one of the apertures, the distance moved to restore the balance is shown upon a suitable scale by means of an index carried by the slide.

This scale may be made to read the values in three different ways—(1), as transparency; (2), opacity; (3), density. The transparency and opacity relate to the transmission and retention of light by the reduced silver in the film; but the third, density is a measure of the amount of silver present, and is the most convenient form in which the values can be taken. Much objection has been made to the use of the term density in this sense, because it has been so commonly used by photographers to mean opacity; it is, however, its true meaning, and represents the physical cause, the opacity being the optical results, and there was no alternative but to use it in its correct dictionary meaning.

The relation between the three is thus shown:—

When density = 1, opacity is 10, transparency $\frac{1}{10}$.

When density = 2, opacity is 100, transparency $\frac{1}{100}$.

The scale will read from 0 to 1·7, and when the value of greater densities is required a stop reducing the light by a known amount is placed at the opposite end, and the value is added to the scale reading.

Standard Light and Exposure.

A further difficulty is here found, inasmuch as there is no known standard of light. Every hour of the day the light varies constantly, to say nothing of the conditions of the atmosphere. To take any artificial light *appears* to have the objection that ninety-nine out of one hundred plates are exposed by daylight; still, it has proved to be the most convenient, careful experiment being made to obtain the photographic (not visual) relationship to daylight, the chemically active rays alone being thus regarded.

The choice made was the standard candle as used by the gas companies, but a limitation to ensure accuracy was also added, it being found that when the candle is burning at a certain height of flame the light given off is very constant. In making a series of exposures, the standard candle is placed at the distance of one metre from the plate, and the exposures are given in seconds; the unit of measurement is, therefore, the candle-metre second (light of one candle at distance of 1 m. for 1 sec.).

For reasons fully explained in the original paper, it is found desirable always to make each succeeding exposure twice the length of the one before, thus, 1, 2, 4, 8, 16 sec., &c. This form of series is by no means an uncommon one in science. For instance, many present are doubtless well acquainted with it in music. Starting with any note, one octave higher the vibrations per second are doubled, at two octaves they are four times as many, at three eight times, and so on.

These exposures are quickly made by means of a rotating disc in front of the plate, having apertures through which the light passes. The largest is 180°, the second 90°, and so throughout. Thus the first allows half the light from the candle to be used, the second a quarter, the third one-eighth, &c., &c. There is a great advantage in making all the exposures at one time, for, should there be any slight variation in the light during exposure, the whole series is affected equally. In order to shorten the time of exposure, the candle may be brought to a position nearer the plate, say, 8·8 in., where it is equal to twenty candles at one metre. If we now expose a plate for thirty-two seconds, the light received by the disc will be 620 cms. (20 by 32), and as the largest aperture, 180°, allows half the light to pass, the highest light received by the plate will be 320 cms., followed by 160, 80, 40, &c.

Care is taken that a portion of the plate is not exposed at all, because any chemical fog must be deducted to find the true action of light. As it is also required to find what difference will be obtained by varying the time of development, a plate is taken of sufficient size, so that, after exposure, it may be cut into several pieces, and developed for different lengths of time.

In order to obtain a comparison between various plates, it is desirable to use a developer of constant composition, and always at the same temperature. The most suitable for experimental work is ferrous oxalate, as it does not reduce silver without light action, as is the case with the alkaline developers. A convenient temperature is 65° Fahr.

After fixing and drying, the measurements of the densities are obtained, the amount of fog upon the unexposed part being deducted from each, which thus gives a series of numbers expressing the combined influence of known exposures and fixed time of development.

The table (diagram 1) gives the densities resulting from exposures varying from $\frac{5}{8}$ to 80 cms., upon portions of a plate developed for two

and three minutes, and a column is added to show the difference between each successive step.

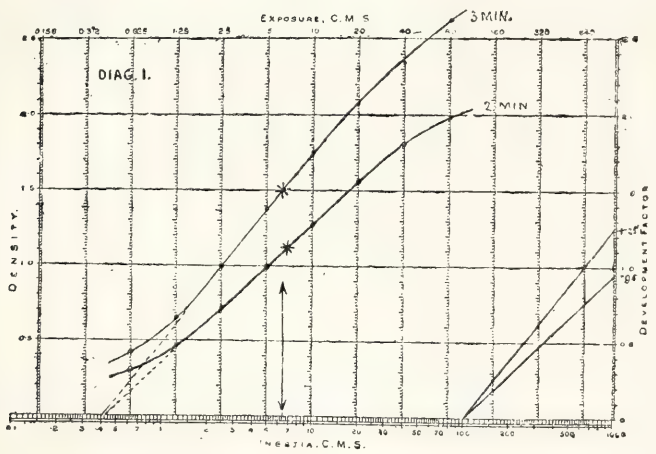
TABLE I.

DEVELOPMENT.

Exposure.	Two Minute		Three Minute	
cms.	Densities.	Differences.	Densities.	Differences.
·625	·31	·15	·42	·23
1·25	·46	·26	·65	·35
2·5	·72	·27	1·00	·38
5·	·99	·28	1·38	·36
10·	1·27	·28	1·74	·33
20·	1·55	·25	2·07	·27
40·	1·80	·18	2·34	·26
80·	1·98		2·60	

It will be well to notice here that, just as before mentioned, doubling the vibrations increased a musical note by equal steps or octaves, so here, also, doubling the exposure increases the silver by equal steps between certain exposures $1\frac{1}{4}$ to 20 cms.

Something more is still needed to separate the influence of light from development, and this is done by systematically recording the results in the following manner:—A paper is ruled with perpendicular lines at



equal distances to represent the successive time exposures, also with horizontal lines to represent the silver densities as measured by the photometer. If, now, the densities are marked off upon the lines of corresponding exposures, a series is obtained, which, when all joined together by a line, form a curve of peculiar shape, and which is called the characteristic of the plate.

The two curves have thus been plotted from the densities given in the table. The first point to notice is, that the general appearance of the curves is not altered by the time of development, though their position is quite different. Each curve has a portion which is practically straight, at each end of which there is a decided curvature. These three portions of the curve represent the periods of under, correct, and over-exposure.

The important point in the correct period being the regular increase of silver with doubled exposure, the longer, therefore, the straight portion the better the plate, as it is found to render greater contrasts correctly. If a plate is very thinly coated with sensitive emulsion, there will be no straight portion, the under and over-exposure curves running together, consequently no truthful resort could possibly be obtained.

The Speed of Plates and Influence of Development.

If the curve is now considered as a whole, it will be found that both the speed value of the plate and the influence of time of development can be separated. The central portion of each curve, marked * on diagram, is found in both, over about the same part of the exposure scale, 6 cms., the practical outcome of which is that, with a subject having great contrasts, taxing the capabilities of the plate to the utmost, the exposure required to obtain the best possible results must be such that the mean light from the subject shall be equal when it reaches the plate to 6 cms. The deepest shadows and the highest lights will then be as correctly represented as the latitude of the plate will allow.

If a slower plate was tried, this mean position of the curve would be found further to the right; if faster, to the left; and thus relative speeds are found. For practical purposes it is best to obtain the speed of the plate from the point where the straight portion of the curve, if produced, cuts the exposure scale, and which there indicates about the smallest amount of light required to commence the correct period of exposure. In this case the lines meet at about ·42 cms., so that the same speed result is obtained with both the 2 min. and 3 min. development.

The only influence of time of development has been to alter the contrasts proportionately throughout, as shown by the table of differences (the 2 min. ·27, and the 3 min. ·36, at each step), by which the resulting negative is made suitable for different printing processes. The 2 min. development is said to have a development factor of ·95 and the 3 min. 1·25 sec. These values are found by drawing lines from 100 cms. on the scale parallel with the straight portions of the curves, and noting the reading upon the density scale at the 1000 cms. line. When the development factor is exactly 1, the negative is an exact inverse representation of the original. When less than 1, the contrasts are less; and when over, greater than the original.

Camera Exposures compared with the Characteristic Curve.

Using the same plate for both a camera and candle series of exposures, where equal reduction of silver is found by the photometer, the active chemical rays, both from the subject and the candle, must be equal. By marking the densities found at any point in the negative, such as grass, walls, sky, &c., upon the corresponding densities of the characteristic, the part of the curve used is shown, and it is thus found that negatives are only satisfactory when, as before stated, the straight portion of the curve is used.

Having thus found how to measure the light given by any portion of the subject, it is still necessary to find the value of the light given to the subject generally in order that this correct portion of the curve shall be used at all times.

The Measurement of Diffused Daylight.

Some years since, when examining the spectrum of nitric-dioxide, Dr. Hurter noticed that light was absorbed without any chemical decomposition; consequently, as heat must result, he argued that, if measured, it should indicate the value of the light. Ultimately, after various trials, a delicate instrument was made, showing the difference in temperature between a red and a white glass bulb when both were exposed to light together. This actinometer was made self-recording, and kept in a north light for over twelve months. On clear, bright days a regular curve was formed, and it was not long before it was discovered that this showed a definite relationship to the height of the sun above the horizon. Thus it was seen that the maximum possible light at any hour of the day throughout the year was a definite amount, which could be calculated beforehand. On cloudy days the fluctuation was, of course, great, still the relationship was often visible, and the variations followed definite rules.

Another instrument, the actinograph, was now devised, and combines all the results previously described. It consists of four scales, two of which are fixed and two movable, and which relate respectively to the light, the speed of the plate, the lens, and the exposure. The light scale, which is wrapped round a revolving roller, consists of a number of curves indicating the mean value of light at each hour of the day throughout the year. In contact with this is a slide bearing the lens and exposure scales, and fixed in a particular position at the bottom in the speed scale.

The fluctuation of light from the mean, indicated by the light scale, has necessarily to be left for estimation at the time, but presents no difficulty once it is fully recognised that the mean light is when the sun just casts a shadow. The variations in exposures required are indicated by five points on a short scale, marked respectively "Very bright," "Bright," "Mean," "Dull," "Very dull."

The method of using the instrument is extremely simple. Let us suppose we are about to take an ordinary landscape at ten a.m., December 15; stop, *f*-64; speed of plate, 48; dull. We first set the speed index to 48 on the speed scale. The date, December 15, is brought to the lens scale, and *f*-64 placed against the curve ten a.m. An exposure of nineteen seconds is shown against the point marked "Dull."

This will secure the best portion of the characteristic curve of the plate being used, and a negative produced which yields a true representation with minimum density. The exposure being correct, the purpose for which the negative is intended must determine the extent to which development shall be carried. A simple table of factors is also given, by which the proper exposure for varied subjects is compared with that required for ordinary landscapes. There are many ways of proving the accuracy of the methods described. One only must suffice.

It is required to produce two negatives from totally different plates, which shall be as closely identical as possible. First obtaining the speed of each of the plates to be used, they are to be found to be 95 and 33, or closely 3 to 1. It is also found that, whilst twelve minutes in the developer is required to obtain a development factor of 1·25 with the fast plate, the slow one attains the same in between five and six minutes.

The exposures having been given as found by the actinograph, and the development continued twelve and five and a half minutes respectively, the two negatives should prove to be alike.

Upon measuring the densities of various parts, an exact correspondence is found in the half-tones, and a very slight deviation at the two extremes, due to slight variation in the thickness of coating and character of the emulsions.

Positives.

Other laws specially relating to the production of positives from negatives have been recently given by Mr. Driffield (THE BRITISH JOURNAL OF PHOTOGRAPHY, p. 606, 1893); still, there is one other point of considerable interest relating to positives which is shown by the characteristic curve. If a series of exposures are made as before, and then the film is stripped from the glass and remounted, one half upon glass and the other upon paper, the portion of the curve used in prints upon paper is readily found. Instead of the straight part of the characteristic being used, only the lower curve can be of service, the blackest part on paper being about the beginning of the correct period in a negative. Consequently, it is impossible to obtain as perfect results upon paper as when glass is used as a transparency, in which case the straight portion of the curve can be made use of exactly as is done in making a negative.

In conclusion, to make a brief summary of these laborious researches still briefer, the main features may be thus stated. When an extended series of exposures is made, each succeeding one being double the one before, the silver reduced by development increases uniformly during a certain short portion of such series. This uniform period can be used to compare one plate with another, and obtain the relative sensitiveness. The nearest approach to truth in any photograph can only be obtained when this uniform period is used. Whilst truthfulness of representation can only be obtained with one definite degree of development, combined with correct exposure, effective contrast or artistic effect is controlled by the extent to which development is carried. Long-continued development may improve an under-exposed negative, but will never fully compensate for the lack of exposure. The mean value of light reaching the earth can be calculated for any time or place, whilst the difference from the mean varies within definite limits. The sensitiveness of the plate and the value of the light being known, correct exposure may be calculated with certainty. The system devised by Messrs. Hurter & Driffield provides means by which the best possible practical results may be obtained and verified by measurement, also original research is greatly facilitated, and can be carried out with scientific precision.

J. STERRY.

PRACTICAL REMARKS ON THE WORKING OF GELATINO-CHLORIDE PRINTING PAPER.

SOME workers urge the necessity of washing the prints before placing them in the toning bath, the reason being that, when the prints are toned direct from the frames, damage to the bath is likely to ensue; with the employment, however, of several small-sized toning dishes, to a very great extent this objection is overcome. Prints from thin negatives, in my opinion, work better without being washed previous to toning, whilst, one of the small baths being set aside specially for the unwashed prints, those with strong contrasts can be treated after washing in the other baths.

With the toning operations concluded, the first stage may be said to be reached, and it is at this point that the difference in treatment between gelatino-chloride and albumen papers begins to be apparent. In many districts where the water supply is not by any means of the highest class, some attention to the final washing of prints is very necessary, and in the winter or other rainy seasons this should be especially attended to.

Let any one, even those who pride themselves on the purity of their water supply, just try the following experiment:—Into a large washhand basin place a good quantity of the water usually employed for washing (I mean by soaking in several changes of water for hours), into this (say about a gallon in quantity) dissolve a teaspoonful of alum, and let the water in the basin stand for about six hours, and then from the precipitate thrown down form an opinion as to the purity of the water they soak their prints in. A good plan is to provide a quantity of this water, syphoned off from the precipitate, as the final soaking bath for the prints, for the utmost care is required when about to place the prints on their glazing supports that no fluff or other impurities be allowed on the face of the pictures.

One of the greatest stumbling-blocks to the employment of these excellent papers has undoubtedly been the failure to get them to leave the glass after being squeegeed on. Once the proper method of doing the work is known, it is simplicity itself, and no failures need ever occur in this respect. Glass has by many workers been discarded simply on account of the refusal of the print to leave the surface, and vulcanite, ferrotype plates, and *papier-mâché* slabs employed instead, but it is only ignorance of the proper method of working that leads workers to employ any of the latter as the glazing support, for glass unquestionably is the best of all materials to use when a high gloss is desired.

The great secret of success lies *in drying the print first*, and then, when going to glaze them, soak for fifteen minutes in a bath of purified water, after the manner described above. I have never known a print to adhere to the glass that was first made thoroughly dry and damped just previously to being laid down on the glasses. This is an infallible cure for the trouble referred to, but it must not be thought a slovenly style of preparing the glasses, for the reception of the prints can follow its adoption. The utmost care and cleanliness must be followed at every stage. These are, first, drying the prints, cleaning the glasses and waxing them, squeegeeing the print down, and backing them. I shall refer to each stage in their order.

After the prints are well washed, they are taken one by one and tacked at the corners on to flat laths. The laths are then hung up in a warm room, or, better still, in a current of warm air, free from dust, till they are quite dry. They will then appear curly, and make a crackling noise when being removed from the drying sticks. While the prints are drying, attention should be given to the preparation of the glasses. Patent plate glass is unquestionably the only really good support to employ, and, in cases where such are being used regularly from day to day, they are first washed in warm water, then polished with whiting, using first a damp and then a dry cloth, until not a particle of dirt adheres to them. They are then rubbed with a waxing solution made up as follows:—Dissolve one ounce of white wax in sixteen ounces of benzine. Form a pad of soft cloth or old linen, and apply a small quantity of the solution to it. With this rub the entire surface of the glass. If it shows streaks or lumps that refuse to rub off with the final polishing cloth, the wax is not properly melted in the solution or the cloth is not suitable, it yielding fluffs, which take up the wax with little lumps or threads. The best material to employ for waxing, in my opinion, is an old linen handkerchief, formed into a pad, polishing off with another one that is kept scrupulously clean and dry. A properly waxed glass ought to show no signs of streaks or lumps, and, when polished, should have a dark glazed surface. A quantity of these can be prepared and stored away for use at any time. They can be packed face to face without deteriorating in any way. With a good stock of such the operation of squeegeeing is reduced to one of simplicity. A word of caution here is necessary, however. A very common practice with some is to begin to clean and polish the glass just when the prints are lying in their final washing water, very often immediately over the basin containing them. The result of this is apparent when the prints are taken from the glasses; they invariably show slug and dust markings carried on to the face of the prints when withdrawing them from the water in the act of squeegeeing them on to the glasses.

Dust is the great enemy to success, and must be carefully guarded against at this stage.

If the final washing water, on being examined, shows any deposit of dust or fluff on its surface, the prints will be certain to suffer, and show signs of the same when taken from the glass. A good plan, therefore, is to cover over the washing dishes with large sheets of glass, and to avoid dust in every shape.

After the prints are quite dry, and a good stock of enamelling glasses are at hand ready to have the prints laid down on them, the prints are placed for at least fifteen minutes in a large bath of purified water. The squeegeeing is then gone on with. I have often laughed heartily when seeing the operation performed by novices. The first thing they do is to obtain a tool just about the worst possible for the job. I refer to that fool of a thing called a roller squeegee.

The proper article to employ is the original old-fashioned piece of thick rubber let into a suitable handle, or, failing such, a piece of sheet rubber having clean edges.

T. N. ARMSTRONG.

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

ANNUAL EXHIBITION.

THE affairs of this popular Association continue to prosper. Under the presidency of Mr. W. J. B. Halley, not only has there, during the present season, been a more than ordinary addition to the roll of membership (an increase of about one hundred members having quite recently been added), but under his reign very many new and interesting features have been introduced into the Society's transactions, among which may be noted the introduction of a novel and interesting competition for lantern sets and lecturettes. This idea emanated with Mr. Halley and Mr. Elder, and, judging from the interest which the members are taking in the matter, a very interesting series of competitions will before long be on the *tapis*. The time for sending in the lecturettes expires in March next, and the members are looking forward with considerable interest to the pleasant nights in store for them, when the judging of the various lectures will take place. We understand the time for delivery by the various authors must not exceed thirty minutes, and the number of slides in

llustration of the lecture are not to be less than twenty, or more than hirty in number.

We understand the membership of the Association is now well on for 350.

The present Exhibition is, both in respect of quality and number of exhibits, far and away ahead of anything the members have yet shown or brought together.

As in previous years, the Council have seen fit to hold the Exhibition in the Association's rooms; but, if in future years the same rate of progress be maintained, the Society will have outgrown existing accommodation.

A noteworthy feature of this year's Exhibition is the alteration in the mode of judging the awards. In former years the Council called in the services of professional photographers and artists to select the prize pictures, but on the present occasion it has been arranged to arrive at this result by means of a ballot on the part of the members, and we are informed by one of the office-bearers that this arrangement has worked satisfactorily.

The entire space of the Association's walls is this year required to hang the exhibits, and the Hanging Committee seem to have executed their task with considerable ability.

Entering the large hall, the first thing to strike a visitor is the almost entire absence of albumen prints; scarcely one is to be seen in the Exhibition.

In the Large Landscape Class, Mr. Macdonald, of Brodick, gets the silver medal for a set of exceedingly fine views in Arran. These are not new productions, however.

In the Small Class, Mr. Ewing secures the silver, and Mr. Oliver the bronze, medal.

Perhaps the best and most interesting Class in the Exhibition is that of Hand-camera Work. The silver medal goes to Mr. T. Taylor, and the bronze to Mr. Victor Alexander. The latter shows a set of very fine yachting studies on the Clyde, whilst Mr. Taylor has selected some charming views near Scarborough. Mr. Snell Anderson shows some very fine work also in this Class, but the members do not seem to have appreciated this exhibit; perhaps, had the awards been alloted by professional judges, these would have been medalled.

The following are the awards:—

Class I. (Landscape. Above Half-plate).—Silver medal, *In Glencloy, Arran. The Brook. A Water Gate* ("I sparkle out among the fens to bicker down a valley"), Alexander Macdonald. Bronze medal, *Waterfoot, Carradale. "When Arran's Peaks are Grey"* (Platinotype). *A Peaceful Haven* (Carbon), John W. Eadie.

Class II. (Landscape. Half-plate and under).—Silver medal, *On the Cart, near Crookston. Autumn. Doune Castle, from Bridge of Menteith*, J. M. Ewing. Bronze medal, *View at Killin. Loch Katrine. On the Road, Loch Katrine*, J. C. Oliver.

Class III. (Portraits, Groups, and Figure Studies).—Silver medal, *Miss Graham. Group, Glasgow Art Club. Miss Tatham*, Stewart Smith. Bronze medal, *Criticism* (Carbon). *Mending Nets and Spinning Yarns. Confidences* (Carbon), John W. Eadie.

Class V. (Enlargements).—Silver medal, *Steamer "Lucy Ashton," near Hunter's Quay. "Spades and Pails." Yacht "Calluna,"* Professor Finlay, M.D. Aberdeen. Bronze medal, *Glasgow University. Barvick Glen, Crieff. On the Clyde*, Arch. Watson.

Class VI. (Hand Camera).—Silver medal, *Views in and about Scarborough*, Thomas Taylor. Bronze medal, *Yachting on the Clyde*, Victor L. Alexander.

Class VII. (Lantern Slides).—Silver medal, Lantern Slides, A. Lindsay Miller. Bronze medal, Lantern Slides, A. Watson.

Class VIII. (Stereoscopic and Window Transparencies). Bronze medal, *Nature's Mirror. Following his Plough. George Square. Hoar Frost. "When Milk comes Frozen Home in Pail." "Infants of the Spring,"* W. Snell Anderson.

Our Editorial Table.

The Microscope and How to Use It.

By T. Charters White, M.R.C.S., &c.

This handbook, published by R. Sutton & Co., 11, Ludgate-hill, is designed with the aim of affording the youngest beginner such directions for preparing objects of interest that he may grasp their details and work out his studies with the most satisfactory results. This work, therefore, may be regarded as a manual of elementary microscopic manipulation for those possessing a microscope and desiring to prepare and mount their own specimens. In this, the second edition, the author has added to what appeared in the first one, by giving a chapter on the staining of bacteria, amplifying those on section cutting and on the microscope itself. The work is illustrated by several nicely executed photographs, enlargements, of course, of microscopic subjects, together with woodcuts, one of which must prove useful to the photographer, as it shows at a glance the easy method of producing photo-micrographs adopted by Mr. White. Solio paper of the smoothest possible texture has been adopted on which to print the specimens interspersed throughout the book, which we strongly recommend as one that imparts much valuable information in a pleasant manner.

News and Notes.

West London Photographic Society.—January 9, Mr. J. A. Hodges, *A Demonstration in Enlarging.*

Mr. R. T. Watson, Anlaby-road, Hull, has had his studio broken into, and a 3A Dallmeyer lens stolen. Its number is 13,071.

Photographic Club.—January 8, at seven o'clock, Annual Children's Entertainment. 10, Mr. John Howson will demonstrate *Matt P.O.P.*

Photographic Society of Great Britain.—January 9, Ordinary Meeting. *Equine Photography*, by Captain M. H. Hayes. A demonstration of the "air brush," by Mr. C. L. Burdick, of Chicago.

Croydon Microscopical and Natural History Club (Photographic Section).—January 5, *Mezzotype*, by Mr. Chas. F. Robinson. 12, Trial Night. Members' Slides. 19, Lantern Evening. Members' Slides. 26, *Rapid Toning Methods*, by Mr. W. D. Welford.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—January 9, Lantern Meeting. January 23, Ordinary Meeting. Mr. J. Hedley Robinson will read a paper on *Stereoscopic Photography*, which will be illustrated by Exhibition of Stereoscopic Apparatus, Negatives, and Slides. Members who have anything of interest in this branch of photography to show are invited to contribute.

Central Photographic Club.—This (Friday) evening, January 5, Mr. C. L. Burdick of Chicago, will give a demonstration of the use of his improved "air brush" in working up photographic drawings, &c., at the Club-room, Coleman's Hotel (late Ashley's), Henrietta-street, Covent Garden. Professionals and others interested are cordially invited to attend. On the following Friday, Mr. F. P. Cembrano, jun., will deliver his lantern lecture on *Granada and the Alhambra.*

Davos Photographic Society.—This Society is one which, unlike many others, is active only during the winter months. The reason of this is not far to seek, Davos being a climatic health resort, where the season lasts from the beginning of October till the end of March. During the summer the numerous hotels and *pensions* are almost empty. The Society was first started during the season 1886–7, and has been continued every year since, with the exception of 1892–3, when nothing was done. It has been customary each season to issue a series of portfolios, and to hold meetings of the members at stated intervals, when photographic matters were discussed or papers read. The portfolios were circulated from time to time among the members who were expected to send in photographs of certain subjects, a prize being awarded to the member who received the largest number of votes. This season a new departure has been made, as, in addition to the portfolios, a weekly meeting is held in the studio attached to the Hôtel Buol. Mr. A. L. Henderson, who has been elected an honorary member of the Society, very kindly offered his services to members, and is always ready at these meetings, or indeed at any time, to give advice on photographic matters generally. We need not add that members have gladly availed themselves of this opportunity to acquire a better knowledge of photography. Already two meetings have been held; at the last a practical lesson was given in reducing, and in a new toning process for celloidin paper.

Durham City Camera Club.—The second Exhibition of Photographs will be held in the Shakespeare Hall, North-road, Durham, on Tuesday, February 6, 1894. The following are the classes:—Section A (for amateur members only). Class 1, General. Three direct prints from 5×4 negatives and under, mounted on one mount. Class 2, General. Three direct prints from half-plate negatives and above, mounted on one mount. Class 3, Portraiture or Group. Three direct prints mounted on one mount (studio work debarred). Class 4, Hand-camera Work (*bonâ fide*). Six direct prints on one mount. Class 5, One Enlargement. A print from original negative to be attached to face of exhibit. Class 6, Four Lantern Slides. Bronze medals and certificates will be awarded in these Classes at the discretion of the Judges. Special prizes:—1. A bronze medal, kindly given by Councillor T. Coates, will be awarded for the best exhibit in Classes 1 to 5 inclusive, for members who have never obtained any photographic award. 2. A bronze medal, kindly given by G. H. Procter, Esq., J.P., will be awarded for the best print exhibited by members. Section B (open to all). Class 7, Direct Print, any size, any subject, any process. In this class, silver and bronze medals, presented by Chancellor T. Milvain, Q.C., will be at the disposal of the Judges. Class 8, Six Lantern Slides. In this Class silver and bronze medals, presented by the Mayor of Durham (Councillor R. Charlton), will be at the disposal of the Judges. The Hon. Secretary is Mr. R. Hauxwell, The Avenue, Durham.

Photographers' Benevolent Association.—Committee Meeting, December 20, 1893, Mr. Mackie in the chair. This was a special meeting called at the request of the Treasurer and President to consider the state of the funds and the possibility of increasing the income, which this year has been considerably below the amount granted. Before going into the finance question three applications were considered:—First from an applicant who had assistance granted to the extent of 2*l.* in October last. Since then he had been living by odd work, and at present was penniless. He had received a good engagement, which he would enter after the holidays. Further loan of 3*l.* was granted. Second, a professional photographer, who had been twelve

months in business for himself and fallen into debt, applied for a loan of 5*l.* to enable him to tide over the bad season. The loan was granted, subject to the Secretary's inquiries proving satisfactory. Third was from an operator out of work, to whom a temporary loan of 10*s.* was granted three weeks ago. The Secretary had meanwhile made further inquiries, the replies to which were perfectly satisfactory. Though the applicant seemed to have no immediate prospect of a situation, relief to the extent of about a 1*s.* a day was granted for a few weeks. Donations were acknowledged from L. C. Brooks, 1*l.* 1*s.*; Birmingham Photographic Society, 1*l.* 1*s.*; R. S. P., 10*s.*; Hazell, Watson, & Viney, 1*l.* 1*s.*; Photography Prize Competition, 4*s.*; An Amateur, 2*s.*; Anonymous, 1*s.*; Charles Job, 10*s.*; C. E. Abbott, 1*s.*; Ernest Spencer, 7*s.* The following were accepted as subscribers:—F. M. Thomson, 2*s.* 6*d.*; the Albion Albumenising Company, 1*l.* 1*s.* Mr. John Spiller, the Honorary Treasurer, then raised the question of finances. He said that the state of the funds was so different from what it had been in any former year that he felt the present year ought not to expire without some special effort to retrieve the position of the Association. Although the income this year had been slightly larger than the regular income, the demand upon the funds had been enormously increased, and the result was that up to the present almost twice as much had been granted as received, and the experience was that after Christmas the income generally dropped to almost nothing, while for some months the demands were likely to remain steady. He read a letter from the President deprecating large grants and strongly advising that the Committee should endeavour to decrease the out-go. The subject was discussed at some length, and the members seemed generally of an opinion that, so long as thoroughly rigid inquiries were made in each case, they could not refuse relief until the Association was absolutely without money. It was decided that the members, both individually and collectively, should make all possible efforts to increase the income, but that to refuse assistance until the surplus which had accumulated during many years was entirely exhausted would be against the wishes of those who subscribed to help the needy.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 8	Camera Club	Charing Cross-road, W.C.
,, 8	Lantern Society	20, Hanover-square.
,, 8	Norfolk and Norwich	Bell Hotel, Norwich.
,, 8	North Middlesex	Jubilee House, Hornsey-road, N.
,, 8	Putney	Boys' Gymnasium, Charlwood-road.
,, 8	Richmond	Greyhound Hotel, Richmond.
,, 9	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 9	Derby (Annual)	Smith's Restaurant, Victoria-st.
,, 9	Great Britain	50, Great Russell-st. Bloomsbury.
,, 9	Hackney	206, Mare-street, Hackney.
,, 9	Manchester Amateur	Manchester Athenæum.
,, 9	Newcastle-on-Tyne & N. Counties	Central Exchange Art Gallery.
,, 9	Paisley	9, Gauze-street, Paisley.
,, 9	Stockton	Mason's Court, High-street.
,, 10	Ipswich and Suffolk	Fine Art Gallery, Ipswich.
,, 10	Leytonstone	Assembly Rooms, High-road.
,, 10	Munster	School of Art, Nelson-place, Cork.
,, 10	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 10	Southport	The Studio, 15, Cambridge-arcade.
,, 10	Stockport	Mechanics' Institute, Stockport.
,, 11	Birkenhead Photo. Asso.	Y.M.C.A., Grange-rd., Birkenhead.
,, 11	Camera Club	Charing Cross-road, W.C.
,, 11	Cheltenham	The College Pharmacy, Bath-road.
,, 11	Glossop Dale	Norfolk-square, Glossop.
,, 11	Hull	71, Prospect-street, Hull.
,, 11	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 11	London and Provincial	Champion Hotel, 15, Aldersgate-st
,, 11	Manchester Photo. Society	36, George-street, Manchester.
,, 11	Oldham	The Lyceum, Union-street, Oldham.
,, 12	Bristol and West of England	20, Berkeley-square, Bristol.
,, 12	Cardiff	Castle Arcade, Cardiff.
,, 12	Central Photographic Club	Coleman's Hotel, Henrietta-st., W.C
,, 12	Croydon Microscopical	Public Hall, George-street, Croydon.
,, 12	Halifax Camera Club	Club Rooms, 12A, Crossley-street.
,, 12	Holborn	100, High Holborn, London, W.C.
,, 12	Ireland	35, Dawson-street, Dublin.
,, 12	Maidstone	"The Palace," Maidstone.
,, 12	West London	School of Arts and Crafts.
,, 13	Hull	71, Prospect-street, Hull.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 28,—Mr. Thomas Bedding in the chair.

Mr. E. D. Bartlett was elected a member.

Mr. LIDDLE (Messrs. Guiterman & Co.), who was to have delivered a paper on *Celluloid and its Imitators*, sent a communication to the effect that, on account of impending litigation, he was obliged to postpone the subject.

Mr. S. HERBERT FRY passed round a dark slide by Chadwick, Manchester, to take either two films or one glass plate.

MATT P.O.P

Mr. J. HOWSON demonstrated Matt P.O.P. After a few preliminary remarks, he said the printing should be carried to about the same stage as with the glossy paper. In mounting the matt prints no special precaution was necessary, while they were certainly more easy to mount than the glossy. If any of the mountant got on the surface of the prints, it could easily be removed with a damp sponge. The washing should be about the same as with the glossy paper, and might with advantage be done with the faces of the prints downwards, in case any impurity should be present in the water and adhere to the surfaces. In toning, sulphocyanide had been found to give the best results. It was easiest to work, the most certain, and gave a greater range of tones than any other bath. It was better to use it freshly prepared, and not to renew the bath from time to time, as it was difficult to keep in proper condition. Adding gold to old toning baths had a tendency to give double tones, or pinkiness in the half-tones. Neither of the latter defects, however, was met with in the matt paper. Having drawn attention to the absence of all gloss from the prints, Mr. Howson pointed out that, though the minimum quantity of gelatine was used, the image was entirely on the surface, so that the whole of the gradation of the negative was rendered, and the fullest possible range was obtained. Proceeding with the washing and toning of several prints, he drew attention to the fact that the prints toned rapidly with a new bath. The tones the prints had when they left the bath were those they would have when dried, as, though they lost a little in the fixing, they regained it in the drying. For warm tones, the prints should be withdrawn from the bath early; for sepias, the gold was doubled, and the prints toned for a short time. The washing after toning was most important, as the paper was then perhaps slightly acid. The paper did not blister. The alum bath was desirable where a large number of prints were dealt with or the weather was hot, a short immersion only being requisite.

Mr. Howson toned both matt and glossy prints. A number of specimen prints were on view, having tones varying from black to sepia.

In reply to a question, Mr. HOWSON said the paper did not stretch so much as albumen paper, as it had a closer fibre. The paper was coated in webs thirty-four inches wide, and this, again, cut into sheets seventeen inches wide.

Mr. J. S. TEAPE had found no difficulty in getting set tones with the paper. It was the most easily worked paper he had ever used, and he did not find that any special care was necessary with it. He had used the borax bath, and preferred it to others.

Mr. W. E. DEBENHAM alluded to the desire of some photographers for matt surfaces, on the ground that they were artistic, and said that glossy paper had been called vulgar. Gelatine paper, which was supposed to have deposed albumen paper, had a still greater gloss. Hitherto matt surfaces gave the shadows with less gradation than had been obtained with glossy papers. The shadows dried up more or less alike with matt papers, as a rule. The sound common sense of the public had declared itself in favour of gradation in the shadows, and, generally speaking, matt-surface papers lost some of the gradations. He thought the glossy surfaces gave the fullest possible range. He was pleased to hear Mr. Howson's claim for a full range of gradation with the matt paper, but thought comparative prints should be shown. As to the removal of the acid in the paper before fixing, if it was necessary to get rid of it with so much washing, it proved how very injurious it was to put some papers direct into a combined bath.

Mr. T. BOLAS, as to the difficulty mentioned by Mr. Howson of getting English-made papers for coating, said suitable papers could be obtained in London. What was wanted was "stock" without chemical action, thoroughly washed, short in texture, and made up evenly. An unequal texture was fatal for albumen paper. It was not very expensive.

Mr. J. BARKER said, in the method given for obtaining sepia tones, he presumed it was the extra quantity of gold which caused the rapidity of toning. In his experiments he had found that, the larger the proportion of gelatine there was in the paper, the redder the tones would be; the less gelatine, the blacker they would be. He had found the cheaper papers best. The more heavily loaded the paper was the better it suited the purpose, and the better it took a substratum. With a thick coating of gelatine, he had found much difficulty in toning; with a preliminary bath of sulphocyanide, however, it was much easier.

Mr. HOWSON, in reply to the foregoing and other remarks, said he had found the same drawbacks with matt as with glossy paper in toning with platinum. The whites were invariably discoloured. He would not have claimed the range of gradation for matt paper unless he made actual tests side by side with the glossy paper, compared with which he could say there was no loss, the image being entirely on the surface of the paper. As regards hand-made paper, it was impossible to coat it at commercial prices. He did not agree with Mr. Barker in his remarks as to the non-necessity of a pure paper. No satisfactory paper could be made unless the paper on which the baryta is put is as pure as for a directly coated emulsion. Baryta was in no sense a preservative.

A vote of thanks was passed to Mr. Howson for his demonstration.

PRESTWICH'S MATT BROMIDE PAPER.

Mr. W. H. PRESTWICH showed several results on matt bromide paper; this gave a matt surface, the image being developed. He drew special attention to one of the prints, from an extremely thin negative which he showed, the result being a true rendering of the gradation.

Mr. DEBENHAM favourably commented on the quality of the prints shown by Mr. Prestwich, especially in regard to range of gradation.

Central Photographic Club.—On Friday evening last, the large Club-room was again crowded, when Mr. LAMOND HOWIE, of Eccles, gave his lecture, *To Oberammergau and back in* 1890. The lecturer took his starting point on the Continent, illustrating his journey down the Rhine by views of various castles, tarrying at various cities on the way, showing many choice architectural studies of portions of the cathedrals. Referring to Cologne Cathedral, he said, in England we failed to appreciate the enormous size and stupendous grandeur of the chief religious edifices abroad. The one under notice had taken 500 years to build. The western spires rose to a height of more than 500 feet, and, notwithstanding their size, the open stone work of the upper stages was as finely finished as the details of the entrance doorways, as his view of the base of one of the spires taken from the opposite balcony showed. The interior had a height of 200 feet from the pavement to the roof, almost sufficient to enable the Monument to be erected inside, the latter being only two feet higher. The museums and art treasures of Nuremburg, Munich, and other towns were dealt with in their turn. Among the noted treasures of Nuremburg was a

portrait of Albert Dürer (who first discovered the principles of perspective), painted by himself, a copy of which was shown. The scenery, towns, and villages in the Tyrol on the way to Oberammergau received their share of attention. The "Passion Play" at the latter place had been acted for upwards of three centuries, and is regarded in the light of a religious service by the villagers. All the actors were selected for their individual particular fitness for the part taken, and preparation goes on for some time before the play takes place. No wigs were worn, and there was no making up. The theatre is open to the sky, which enabled photographs of the proceedings to be secured. The "play" commences at eight in the morning, at mid-day there was an hour for refreshment, and it was not until five o'clock that the Crucifixion was reached. The whole thing was carried out with the greatest decorum and solemnity. The slides exhibited showed that many of the details of the scenes were copied from the old masters; this was particularly noticeable in the Crucifixion. Portraits of Joseph Meyer, the Burgomaster, and his daughter, and others who took leading parts, were shown. Although a great deal had been said to the contrary, the lecturer felt certain that the "Passion Play" would again take place when the year 1900 came round. The return journey was made by the valley of the Inn, calling at Innsbruck, where there is an English colony, such as may be found at hotels at Brighton or Scarborough. A number of slides, illustrating the peculiar "earth pyramids" at Oberbotzen, were exhibited. Some of these pyramids were of great size, and resembled, in general form, partly closed umbrellas protruding from the ground. An explanation of the formation of these wonders of nature were given.

North London Photographic Society.—December 19, Mr. A. E. Smith in the chair.—Mr. WALKER showed lantern slides on Hill Norris plates. He found the plates well suited for reduction work, being extremely rapid. Mr. S. H. FRY gave a lecture and demonstration on the Paget Prize Plate Company's printing-out and other lantern plates, and the new printing-out paper. The slow plates were recommended for warm tones, to secure which a longer exposure must be given, and more bromide and carbonate of ammonium used in the development. There was no better developer than hydroquinone for these plates. With the printing-out slides, all the tones could be obtained that could be got on albumen paper. The development of them was the same as for the printing-out paper. Mr. Fry preferred a combined bath, made according to the following formula:—Acetate of lead, 1 ounce; hypo, 1 pound; powdered chalk, 1 ounce; water, 4 pints. To each five ounces of this add one grain of gold at time of using. Use in the proportion of seven and a half ounces to each sheet of paper, and throw away after using.

Woodford Photographic Society.—December 21, the President (Mr. H. Wilmer) in the chair.—A discussion on *Toning Gelatino-chloride Prints* was opened by Mr. E. B. CAIRD, who preferred the combined toning and fixing bath recommended by the Eastman Company. He showed prints toned by this both to a rich warm brown and a purple. He said that keeping the paper perfectly dry was absolutely necessary in order to obtain uniform results. The Secretary (Henry W. Bennett) showed several prints on the new Ilford matt P.O.P., expressing the opinion that the new paper was a most valuable advance in photographic printing, combining the advantage of gelatino-chloride with a drawing-paper surface. He advocated the use of borax toning bath in preference to the sulphocyanide usually recommended, purer red and brown tones being obtainable, with an entire absence of blue half-tones that sulphocyanide frequently gives. He said that pure sepia tones could not be obtained by gold toning at all, a red-brown or a purple-brown being the nearest approach. He showed a print toned with platinum to a colour closely resembling sepia platinotype, the toning bath being:—Potassium chloro-platinite, one grain; hydrochloric acid, four minims; water, four ounces. For this bath prints must be very deeply printed, and toned until almost black, as they lose both colour and depth in the fixing bath. Mr. H. T. MALBY had always used a sulphocyanide bath, but preferred separate toning and fixing. In regard to the combined toning and fixing bath, he said that he had specially prepared some prints in order to test their permanency. They were all toned in the combined bath to the same colour, some being afterwards refixed in a plain hypo bath for about ten minutes. All the prints after washing and drying were put loosely away for two years where the air had free access to them. Those that had been refixed were as fresh and bright as when first made, the others badly spotted all over.

Leeds Camera Club.—December 22, first Annual Exhibition of Magic Lantern Slides made by Members from their own Photographs.—Three hundred slides were passed through the lantern, and were well received. These included some fine seascapes and cloud effects, by Mr. Maurice May; a set of views of Norway, &c., by Mr. Wigglesworth; some interesting results of photographs taken in the Malay Peninsula, by Mr. Wilson; a few pictures of Paris, by Mr. Palliser; and a series of slides illustrating a tour in Flanders, by Dr. Thresh, filled up the foreign portion of the programme; whilst Mr. Little's views of the Isle of Man, which included some laughable snap-shots taken on Douglas Head, were the chief slides of English views, though views of Scarborough, Bridlington, Yorkshire, Sussex, London, &c., by Messrs. Eastwood, Middleton, Swindon, Hutchinson, Foster, Diment, and Howell were numerous. Comic views, optical illusions, portraits, snap-shots, poses, &c., by members, were shown, and received much applause. Mr. Vevers' contribution to the evening consisted of a set of original slides, photographed and made for the occasion, and entitled, *The Photo-Cyclist on the War-path.* These described the adventures and mishaps of a photographing cyclist on his holiday, and were received with loud cheers and much laughter, as the model who had posed for the photo-cyclist was a personage well known to most present, and is an active member of the Club. Altogether a most enjoyable evening was passed, the slides being above the average amateur work. This speaks well for the new Club, and we have no hesitation in saying that a club that can show such good results after being but three months in existence has brilliant prospects for the future. The President (Dr. Thos. Thresh, Ph.D., L.R.C.P.), and Mr. Wigglesworth manipulated the lantern, whilst the Secretary (Mr. Hutchinson) did the reading. The lantern, limelight, &c., was by Vevers, Leeds.

Photographic Society of Ireland.—December 21, Mr. J. H. Woodworth occupied the chair.—Mr. W. F. COOPER delivered his lecture entitled, *To the Isle of Man with the Hand Camera*, and illustrated it with several views taken in the island, and described various places interesting to tourists sojourning in the locality. After the lecture, a discussion on matters of photographic interest took place, and was opened by Mr. R. M. INGLIS, who gave his experience with the incandescent gaslight which he had lately tried for the purposes of enlarging and reducing.

FORTHCOMING EXHIBITIONS.

1894.	
January 5–22	*Bristol Triennial International Academy of Arts, Bristol. Hon. Secretary, F. Bligh Bond, 16, Corn-street, Bristol.
——	*Exeter Amateur Photographic Society. Hon. Secretary, John Sparshalt, Fairfield House, Alphington-road, Exeter.
,, 15–29	*Photographic Society of Ireland. Hon. Secretary, J. A. C. Ruthven, 35, Dawson-street, Dublin.
February 6	Durham Camera Club. Hon. Secretary, R. Hauxwell, The Avenue, Durham.
,, 8–10	Woolwich Photographic Society. Hon. Secretary, W. Dawes, 145, Chestnut-road, Plumstead, S.E.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

* Signifies that there are open classes.

RECENTLY ELECTED OFFICERS OF SOCIETIES.

(*Received too late for the* ALMANAC.)

AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.—Established 1883. Place of meeting, Royal Society's Rooms, Melbourne. *Secretary:* Mr. J. H. Harvey, 127, Gipps-street, East Melbourne.

ARBROATH AMATEUR PHOTOGRAPHIC ASSOCIATION.—*President:* Mr. G. G. Dalgarno.—*Vice-President:* Mr. Robert Moodie.—*Committee:* Messrs. M'Leish, Whyte, Young, Robertson, and Davidson.—*Treasurer:* Mr. George Reid.—*Secretary:* Mr. James Hood.

BALLARAT AMATEUR PHOTOGRAPHIC ASSOCIATION.—Established 1886 Place of meeting, School of Mines, Ballarat. *President:* Mr. W. H. Wooster.—*Vice-President:* Mr. J. Fletcher.—*Committee:* The office bearers with Miss Baker and Miss Oddie.—*Treasurer:* Mr. J. J. Young.—*Secretary:* Fred Foster, 146, Lydiard-street, Ballarat, Victoria, Australia.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION.—Meetings the third Tuesday in each month at the Young Men's Christian Association, Birkenhead. *President:* Mr. Thomas Mansell.—*Vice-President:* Mr. C. B. Reader.—*Council:* Messrs. G. Latimer, W. T. Briggs, W. H. Hunt, D.Mus., G. S. Stansfield, M.D., G. A. Carruthers, J. H. Welch, F. Hopedones.—*Librarian:* Mr. J. A. Forrest.—*Auditors:* Mr. A. Bradbury and Mr. H. S. Nicklin.—*Treasurer:* Mr. A. F. Edwards.—*Secretary:* Mr. Charles Male, 28, Grange-mount, Birkenhead.

CHICAGO LANTERN SLIDE CLUB.—Established 1886. Place of meeting, 913, Masonic Temple. *President:* Mr. Charles P. Stivers.—*Committee:* Officers.—*Treasurer:* Mr. E. J. Wagner.—*Secretary:* Mr. W. A. Morse, 20, Kemper-place.

DEUTSCHER PHOTOGRAPHEN VEREIN.—Established 1876. The annual meeting (Wanderversammlung) for 1894 is in August at Frankfurt-on-the-Main. *President:* Herr K. Schwier.—*Vice-President:* Herr. Friedr. Müller.—*Council:* Herrn L. W. Kurtz, Cour Kindermann, Oscar Suth, Karl Wunder.—*Secretary and Treasurer:* Herr. Sohwier.

DEVON AND CORNWALL CAMERA CLUB.—*President:* Colonel R. Barrington Baker.—*Vice-Presidents:* Mr. W. G. Tweedy, B.A., and Mr. R. Burnard.—*Council:* Dr. Aldridge, Messrs. Micklewood, D. Roy, Watson, Turney, Hawker, Misses Hemsley and Keen.—*Hon. Treasurer:* Mr. C. R. Rendle, M.R.C.S.—*Hon. Secretary:* Mr. R. Hansford Worth, C.E., 42, George-street, Plymouth.

DONCASTER MICROSCOPICAL AND GENERAL SCIENTIFIC SOCIETY.—Established 1880. Place of meeting, Free Library, Doncaster. *President:* Mr. J. B. Prosser. *Vice-Presidents:* Messrs. George Winter, J. G. Walker, J. M. Kirk, F.R.M.S., H. H. Corbett, M.R.C.S.—*Council:* J. Shotton, Rev. Canon Tebbutt, M.A., Messrs, T. L. Atkinson, M.A., LL.B., H. Culpin, W. E. Atkinson, J. Mitchell Wilson, M.D.—*Secretary and Treasurer:* Mr. M. H. Stiles, 2, French-gate, Doncaster.

EALING PHOTOGRAPHIC SOCIETY.—Established 1890. Meetings, every Thursday, at Public Buildings, Ealing. *President:* Mr. H. W. Peal.—*Vice-Presidents:* Messrs. C. Jones, F. White, T. Simpson, H. C. Draper.—*Council:* Messrs. C. Whiting, F. Wakefield, A. Belt, G. Gregory, Dr. Clifford Gibbons, Dr. H. McD. Phillpotts.—*Hon. Librarian:* Mr. B. E. Peal.—*Hon. Treasurer:* Mr. A. F. Taylor.—*Hon. Secretary:* Mr. R. T. Murphy, Argyle-road, Ealing.

EDINBURGH PHOTOGRAPHIC SOCIETY.—*President:* Dr. Thomas W. Drinkwater, F.C.S.—*Vice-Presidents:* Mr. J. C. Oliphant and Mr. F. P. Moffat.—*Council:* Messrs. Herbert W. Bibbs, Hippolyte J. Blanc, A.R.S.A., Richard W. Hawks, James Patrick, Sydney Keith, A. W. M'Gregor, W.S., G. G. Mitchell, Thomas Wardale, John Anderson, Andrew H. Baird, George Cleland, R. S. Webster.—*Librarian:* Mr. George James M'Craw.—*Treasurer:* Mr. James M'Glashan.—*Secretary:* Mr. T. Barclay, 180, Dalkeith-road, Edinburgh.

KINGSTON-ON-THAMES AND DISTRICT PHOTOGRAPHIC SOCIETY.—Established 1893. Meetings fortnightly. *President:* Rev. G. I. Swinnerton.—*Committee:* Mr. C. E. Abney, Dr. Cowen, Messrs. Albert Hill, — Lemarcham, — Price.—*Hon. Treasurer:* Mr. Robertson.—*Hon. Secretary:* Dr. Finny, Kenlis, Kingston Hill.

MIDLAND CAMERA CLUB.—Place of Meeting, Medical Institute, Edmund. street, Birmingham. Established 1891. *President:* Mr. Hall Edwards, L.R.C.P.—*Vice-Presidents:* Mr. H. R. Leech, M.R.C.S., Professor Allen, Mr. S. G. Mason.—*Council:* Messrs. J. K. Beaufort, T. H. Cox, T. Fletcher, F. Iles, S. H. Seeson, F. H. Mason, A. H. Slade, and Mrs. W. D. Welford.—*Secretaries:* Mr. Chas. Jevons Fowler, L.D.S.R.C.S.Eng., 4, Woodstock-road, Moseley, Birmingham; Mr. R. J. Bailey, 163, Devonshire-street, Birmingham.

MIDLOTHIAN CAMERA CLUB.—*Patron:* the Marquis of Lothian.—*Hon. President:* Professor A. Crum Brown, LL.D., &c.—*President:* Mr. Hugh Marshall, D.Sc,—*Vice-Presidents:* Messrs. Alex. Thomson and W. Ivison Macadam, F.R.S.E.—*Council:* Rev. J. T. Burton, Messrs. C. F. Falconer, J. Purves, J. M. Clark, James Hay.—*Treasurer:* Mr. W. C. Callender.—*Secretary:* Mr. A. D. Guthrie, Bonnington.

MUNSTER CAMERA CLUB, CORK.—*President:* Mr. John Day.—*Past President:* Major J. D. Lysaght, A.P.D.—*Vice-Presidents:* Messrs. Ringrose Atkins, M.A., M.D., Denny Lane, M.A., Henry S. Noblett.—*Committee:* John Bennett, James Bradshaw, Richard Foley, Gerald Percival, Louis Egan, Patrick Hallinan, W. H. Harrington, Hardaker Lund, K. B. Williams, Arthur Newson.—*Hon. Lanternist:* Mr. H. Lund.—*Hon. Treasurer:* Mr. W. R. Atkins.—*Hon. Secretary:* Mr. R. S. Baker.—*Hon. Assistant Secretary:* Mr. E. P. Newnham.

NELSON CAMERA CLUB.—Established 1888. Meeting, third Friday in each month at Mr. Fell's office, Hardy-street, Nelson, New Zealand. *President:* Mr. C. Y. Fell.—*Council:* Messrs. H. Brusewitz, R. D. Jackson, A. Pitt.—*Secretary and Treasurer:* Mr. Arthur H. Patterson, care of Messrs. Sclanders & Co., Nelson.

NORTHERN TASMANIA CAMERA CLUB.—Established 1889. Place of meeting, Mr. R. L. Parker's rooms, St. John-street. *Patron:* His Excellency, Viscount Gormanston, K.C.M.G., Governor of Tasmania.—*President:* Rev. A. H. Champion, M.A.—*Vice-Presidents:* Dr. H. A. Roome, Messrs. F. Styant Browne, and R. C. Kermode.—*Council:* Messrs. F. Stuart, W. H. Twelvetrees, and C. Nickolls.—*Secretary and Treasurer:* Mr. John Sparrow, 78, Brisbane-street, Launceston, Tasmania.

OLDHAM PHOTOGRAPHIC SOCIETY.—Established 1867. *President:* Mr Joseph S. Dronsfield.—*Vice-President:* Mr. James Brooks.—*Committee:* Messrs. S. Ashton, J. Chadwick, J. Dawson, T. Heywood, M. Piper, and W. Thompson,—*Librarian:* Mr. B. J. Holt.—*Treasurer:* Mr. W. Schofield.—*Hon. Secretary:* Mr. Thomas Widdop, 16, Burnaby-street, Oldham.—*Assistant Secretary:* Mr. J. H. Ashton.

OXFORD UNIVERSITY PHOTOGRAPHIC CLUB.—Place of meeting, 24, Friars' Entry. *President:* Mr. A. McMullen.—*Committee:* Messrs. A. H. C. James, F. J. Varley, H. E. Cartwright.—*Treasurer:* Mr. J. Walker, M.A.—*Hon. Secretary;* Hon. G. L. Parsons.—*Assistant Secretary:* Mr. A. H. C. James.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.—Established 1862. Place of meeting, 10, South Eighteenth-street. *President:* Mr. Joseph H. Burroughs.—*Vice-Presidents:* Messrs. Edmund Stirling and Charles R. Pancoast.—*Board of Directors:* The Officers and Messrs. John C. Browne, John G. Bullock, John Carbutt, Samuel Castner, Jun., J. Hunter Ewing, Herbert M. Howe, M.D., Frederic E. Ives, Caspar W. Miller, William H. Rau, Anthony W. Robinson, Samuel Sartain, William N. Jennings.—*Treasurer:* Mr. George Vaux, Jun.—*Secretary:* Robert S. Redfield, 1601, Callowhill-street.

SHROPSHIRE CAMERA CLUB.—*President:* Mr. F. W. Williams.—*Vice-Presidents:* Messrs. Martin J. Harding, W. W. Naunton, G. Bidlake, W. S. Buddicom, J.P.—*Council:* Messrs. W. Alltree, M. G. Preece, J. L. Della Porta. R. J. Irwin, J. Pyefinch, W. Bowdler.—*Hon. Treasurer:* Mr. W. Benson.—*Hon. Secretary:* Mr. W. Heath, Elmfield, Shrewsbury.

SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.—Established 1885. Place of meeting, Chamber of Manufactures, North-terrace, Adelaide. *President:* Mr. C. F. Clough, Assoc.M.Inst.C.E.—*Vice-President:* Mr. E. W. Belcher.—*Committee:* The Officers and Messrs. G. Stace, S. J. Dailey, A. W. Dobbie.—*Librarian:* J. D. Dixon.—*Treasurer:* R. B. Adamson.—*Secretary:* A. H. Kingsborough, Childers-street North, Adelaide.

ST. BARTHOLOMEW'S HOSPITAL PHOTOGRAPHIC SOCIETY.—Established 1890. Meetings are held at intervals during the Winter Session. *President:* Dr. W. J. Russell, F.R.S.—*Vice-Presidents:* Dr. H. Lewis Jones and Mr. F. Womack, M.B.—*Additional Committeemen:* Messrs. G. A. C. Calvert, S. E. Gill, W. B. Jones, M.B.—*Hon. Secretaries:*—Messrs. D. W. Collings and J. Hussey.

TASMANIAN PHOTOGRAPHIC, SCIENCE, AND ART ASSOCIATION, HOBART.—Established 1887. Place of meeting, Museum. *Patron:* His Excellency, Lord Gormanston.—*President:* Mr. Robert Henry.—*Committee:* Messrs. A. Morton, C. Allport, Russell Young, H. Downing, E. Scott, D. Allport, W. K. Morris, R. McGuffie, E. R. Ash, H. J. Buckland, C. L. Hodgman.—*Treasurer:* Mr. F. J. Paterson.—*Secretary:* Mr. Nat. Oldham, 79, Barrack-street, Hobart, Tasmania.

TORONTO CAMERA CLUB.—Meets every Monday from October to April. Holds a yearly exhibition in January. *Hon. President:* Prof. W. H. Ellis, M.D.—*President:* Mr. Arthur W. Croil.—*First Vice-President:* Mr. W. H. Moss.—*Second Vice-President:* Mr. George H. Gooderham.—*Committee:* Messrs. Hugh Neilson, J. G. Ramsey, Edmund E. King, M.D., E. H. Walsh, G. R. Baker, R. G. Muntz. *Secretary and Treasurer:* Mr. Ernest M. Lake, 17, Jordan-street.

WELLINGTON CAMERA CLUB.—Established 1892. Meets on the second Friday in each month in Exchange-buildings, Lambton Quay. *President:* Mr. W. F. Barraud.—*Vice-Presidents:* Messrs. W. F. Beswick and H. E. Taylor.—*Hon. Secretary:* Mr. William C. Stephens, 26, Butler-street, Wellington, N.Z.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 24,457.—"Improvements in Photographic Apparatus." Complete specification. G. DEMENEY.—*Dated* December 19, 1893.

No. 24,470.—"Improvements in Magazine Cameras." S. D. WILLIAMS.—*Dated* December 20, 1893.

No. 24,487.—"Improvements in Photography." A. BURCHETT.—*Dated* December 20, 1893.

No. 24,647.—"Improvements in Photographic Cameras." Complete specification. E. BETAULT and FOX SHEW.—*Dated* December 21, 1893.

No. 24,671.—"Improvements in Photographic Apparatus." J. W. BEAUFORT.—*Dated* December 22, 1893.

No. 24,823.—"Casket for Containing Photographs." A. MURRAY.—*Dated December* 27, 1893.

No. 24,963.—"Improvements in Producing Photographic Prints." J. PACKHAM.—*Dated December* 27, 1893.

No. 24,995.—"New or Improved Means for Displaying Stereoscopic Photographic Transparencies." E. IRELAND.—*Dated December* 29, 1893.

No, 25,002.—"Improvements relating to the Development of Photographic Pictures." M. ANDRESEN.—*Dated December* 29, 1893.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE DEVELOPMENT OF GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—Having read Mr. Lindsay's article on the above subject, seeing that he has not been so successful with it as I have been, I trust that my experiments may be of interest to your readers. I bought a two-sheet tube of P.O.P., and pulled down the blinds of the room, which are of a yellowish colour, and give a comfortable light to work in. After having cut the sheets to the desired size, taking care not to expose them too much to the light, the paper being sensitive even to the yellow light if exposed for a considerable time, and having packed all the cut pieces in an empty dry-plate box, I placed one in the printing frame, exposed it behind the blinds in the window, until a faint image was visible. I then made up a ferrous-oxalate developer, as recommended for the "Ilford" bromide paper. Before placing the print in the developer, I left it in a ten per cent. solution of ammonium bromide for about three minutes, slightly rinsed it in water, and placed in the developer. The image came out slowly, so that development could be stopped at will; and here it must be borne in mind that (as one would say) you have a wet printed-out print, which intensifies in the toning; therefore, the prints must be lifted from the developer when they reach the tone of a wet printed-out print.

I have made splendid vignettes in the above manner, which could not be identified from the printed-out ones, save in the superiority of the half-tones, which show no sign of double toning.

Now, in conclusion, I unhesitatingly say, as it has been announced in the JOURNAL a year or more ago, taking into consideration the ease of manipulation and the rapidity of printing, that it is "the printing process of the future."—I am, yours, &c., T. MATHIAS.

Bryndyfan, Kilgerran, R.S.O., South Wales, December 27, 1893.

COPYRIGHT IN PHOTOGRAPHS.

To the EDITOR.

SIR,—I strongly recommend those who are interested in this subject to follow my advice rather than Mr. Elliott's for the following reason. Though, according to paragraph 1, there is no doubt about the copying of a painting being subject to the law I enunciated, there is in the Act an unfortunate confusion in the use of the word negative, and I will pass no opinion as to what would be the verdict in the case of a copyright being claimed when the bargain as to who should possess it had not been made at the time of sale of a photographic print. But, according to paragraph 2, it is not punishable to copy a photograph *before* it is registered, and my readers may imagine the difficulty that would arise as to whether a photograph was copied before or after registration. I do not know upon whom the onus of proof would lie, but I can easily see how much could be made of such a point by an opponent's counsel if a case were carried into court. A victory on a contested technical point is not, as a rule, worth while fighting for. I thing it may be interesting to append an extract from the Act.

"The author . . . . of every original painting, drawing, or photograph . . . . shall have the sole and exclusive right of copying . . . . multiplying such painting . . . . or such photograph and the negative thereof . . . . provided that when any painting or drawing, or the

negative of any photograph, shall, for the first time after the passing of this Act, be sold or disposed of, or shall be made or executed for or on behalf of any other person, for a good or a valuable consideration, the person so selling or disposing of, or making or executing the same, shall not retain the copyright thereof, unless it be expressly reserved to him by Agreement in Writing, and signed at or before the time of such sale or disposition by the vendor or assignee of such painting or drawing, or of such negative of a photograph . . . . but the copyright shall belong to the vendor or assignee. . . . . Nor shall the vendor or assignee thereof be entitled to any such copyright, unless at or before the time of such sale or disposition an agreement in writing signed by the person so selling . . . . shall have been made to that effect."

"2. Nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright."—I am, yours, &c.,

FREE LANCE.

ACTION OF METOL ON THE SKIN.

To the EDITOR.

SIR,—There have lately been a good many reports circulated that metol affects the skin, and, as we are desirous of contradicting these reports, we beg to say that metol in solution will not attack the hands of the operator except when the operator omits to carefully wash his hands during and after use. Operators whose hands are easily irritated by reason of their very delicate skin should before using the solution first grease their hands with lanoline or vaseline, then rub them dry again to prevent any itching or other irritation. There is no doubt that any developer in solution will attack the skin if carelessly handled. On this point pyrogallic acid is by far the most poisonous chemical we know of, and is used at present, in spite of this, to a very large extent without rubber finger-stalls.

We can safely assert that metol attacks the skin in very exceptional cases only, and where this is very delicate; this attack is usually produced through washing insufficiently. This is borne out by the few cases that have been mentioned during the last twelve months, during which time this developer has been in the market in this country. On the Continent no cases have been brought under the notice of the manufacturer.

Metol is steadily gaining favour from all classes of photographers, and we have no doubt that it will replace pyrogallic acid in course of time.

We should feel obliged by your inserting this letter in your valuable paper as we are desirous to safeguard the interest of our manufacturer.—I am yours, &c.,

FUERST BROS.

17, *Philpot-lane, London, E.C.*

Answers to Correspondents.

RECEIVED.—G. Wright & Co.; the Cresco-Fylma Company; Fitch's Film-carrier; *Atelier de Photographen;* King's Solution from Marion & Co.; W. Tylar (Birmingham); and others. In our next.

A. E. TUCKER.—Communication received.

B. D.—We only answer photographic questions.

W. DUDDELL.—Not without injury to the fabric.

R. C. PHILLIPS.—Much obliged for the reminder.

A. L. STEVENSON.—Thanks. The print is an excellent one.

J. H. G.—Very sorry we cannot offer any advice in the matter referred to.

A. R. E.—Thanks. We have thought it better to close the correspondence.

M. H. HAYES.—1. Try the effect of ammonia vapour on the plates. 2 Yes. 3. Yes.

ONE INTERESTED.—The firm named are the agents. The paper will, doubtless, be placed on sale shortly.

R. LUDERS (Gorlitz).—The address of Mr. John Anderton is, c/o Messrs. R. Field & Co., Suffolk-street, Birmingham.

M. A. FIX.—If good sulphate of iron and pure water be used, the solution will not behave as stated. If all the iron is precipitated, of course there will be no developing action.

R. WEBBER.—It is possible, but the small quantity recoverable, if the bath be properly utilised, will not be worth anything like the trouble it would entail at the present price of the salt.

AN OLD SUBSCRIBER.—We advise you to exchange the telescope for a photographic lens of similar diameter. A telescope object-glass is not corrected for photography. The microscope, too, cannot be utilised for this purpose.

W. R. KING.—A ten shilling licence is required to use a still. This will entitle you to redraw the diluted methylated spirit, but not in any way to remove the methyl, or other impurities, which the law compels the addition of.

T. MCBRIDE.—If you have had an apparatus in use publicly in the studio for years, and the same has just been patented, the patentee cannot stop your still using it. What is more, his patent is not valid. The fact that you have been working with the apparatus in your business, and your brothers and others in theirs, is quite sufficient to upset any subsequent patent.

CYMRO.—The amount of separation of the lenses can only be determined by trial. Obtain a number of narrow rings, and make your trials by using one or more of them. The best distance, once obtained, will serve for all lenses of the same make.

W. J. C.—This query is very similar to that of "R. H.," but the other way about. This correspondent complains that he paid money to an agent in a portrait club, and can neither get portrait nor the money back from the agent. The principal is the responsible party.

E. A. J.—If the local chemist supplied the mounts with the guarantee that they would not affect the photographs, it is to him that you must look for redress. It is no use his saying that he is not responsible because he got them from a first-class foreign manufacturer.

W. W. W.—Possibly the salt can be obtained from Hopkin & Williams. We have had no experience with it ourselves. No work devoted to the subject has been published in the English language.

C. BRYANT.—We do not recommend the use of pressure gauges on gas cylinders. More than one accident has been attributed to them. By all means use a regulator. It is a great convenience, and does not entail danger. At present we have nothing to add to what has appeared with regard to the late bursting of a cylinder.

C. R. H.—If the residues are sent in the state they are to a respectable refiner, you will obtain a fair value for them; but it must be borne in mind that drying the washings, burning the paper, &c., and roughly separating the extraneous matter entail labour which will be charged for in the expenses of reducing. Much of this cost will be reduced by doing that part of the work before sending the waste away.

L. E. E. D. S.—The crystals of sulphate of iron and oxalate of potash at the bottoms of their respective bottles, although the solutions had been filtered, are easily accounted for. The solutions were saturated at the temperature at which they were when filtered. They were then allowed to become colder; when at that temperature they were supersaturated, hence the deposition of the salts. If the temperature be still further reduced, more of the salts will crystallise out.

A. C.—To ascertain how much silver there is in a sheet of gelatino-chloride printing-out paper, first burn it and then calcine the ash. Then fuse in a small clay crucible at a strong heat with a mixture of carbonate of potash and carbonate of soda. When the mass is in a liquid state, the operation may be facilitated by dropping one or two small crystals of saltpetre into the crucible. When the silver is reduced, the pot is allowed to cool and then broken. The metallic silver is then carefully weighed.

G. S.—1. Unless you hide both yourself and the camera behind a curtain, and allow the lens to see the room in the convex mirror through any convenient hole or fold, it will not be possible to prevent both from being seen in the photograph. The only way for avoiding this is to place the mirror or the camera so as to cut off its reflecting power. 2. The mineral naphtha cannot be separated from methylated spirit of wine. 3. To copy a print having letterpress at the back, you must employ a camera in a strong light. 4. To copy an object its own size with any lens, the camera must be expanded to twice the focus of the lens. See the table for enlargements, page 970 of our ALMANAC.

LONG FOCUS writes as follows:—"A. bought the photographic business and negatives from R. A. made an enlargement from a negative taken by R., and took orders for same. The widow of the sitter objects to this, and demands that the sale, and also the exhibition of the enlargement in the window shall cease, no permission having at any time been asked or granted by sitter or his widow. What is the law as regards this?"—We are not aware if a case, such as that referred to, has been decided in a court of law, or if there is a law to meet it, except, perhaps, by an injunction from the Court of Chancery. We should have thought that any one purchasing a business in a provincial town would be very unwise to proceed with the negatives taken by the late proprietor of it in the way our correspondent is doing. We speak from an entirely business point of view.

R. H. writes as follows: "I made an arrangement with a man to act as an agent for me in obtaining orders for club portraits in some factories with which he was indirectly connected, paying him commission on all the orders he obtained. He was supplied with a receipt-book by me. He has now left the country and gone to America, and I find he has taken the money for a large number of portraits, which he has not paid in to me, but for which he has given receipts on the forms I supplied him with. Under these circumstances, as I can prove I have not received the money, am I compelled to take the portraits without charge? Those who have paid their money say I am, and are threatening legal proceedings against me."—Our correspondent will certainly have to supply the portraits on the terms made by the agent with the subscribers, whatever they may be. A principal, in such cases as this, is responsible for the action of his agent.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1758. Vol. XLI.—JANUARY 12, 1894.

FOGGED NEGATIVES.

Recently we had brought to us for our advice upon it an excellent negative of a very pretty view—a large mansion in the distance, framed in, as it were, with a bordering of trees on either side, while a wide avenue stretched from building to camera. The negative, as we said, was excellent—almost perfect—save for one grave defect, it was not as crisp as it should be, and the whole effect was as though the plate were slightly fogged, although this effect was not very perceptible in the prints. We were informed that several negatives taken of this one particular view all exhibited the same peculiarity. The dark slides had been carefully overhauled, as also the camera itself, for any possible pinhole or crevice; but nothing could be found. The view was wanted of special excellence, so another negative was taken; this time all that could be required. Singular to relate, a disaster befell the replica negative; and, when it was taken a third time, the fog reappeared. Further examination revealed no light-permitting aperture, and we are rather afraid the platemaker came in for the usual blame. At this stage our intervention or advice was solicited. We asked for all the negatives to be shown us, and we were at once able to point out the cause of, if not the remedy for, the evil.

The first and third negatives had no clouds, only a plain sky; the second, fogless one, had a few slight clouds just visible. Hence the view which was in full sunlight embraced a large sky area, which formed a brilliantly illuminated, hazy, cloudlike background, the image of which, thrown on the plate, even with a small diaphragm in the lens, was so bright, that the whole of the interior of the camera was lighted up by the reflected light from the surface of the plate, the lens itself reflecting also a considerable amount of light back into the camera. Now, the brilliancy of this background of bright sky formed no factor in the exposure of the building and landscape; hence, a full exposure being given, it required no argument to prove that the plate itself during exposure must be subject to a certain amount of faint diffused light that the interior illumination of the camera would cause.

This explanation may seem a little far-fetched, but closer examination will show that it is the true one, and a very simple proof can be made. Let any one place a small object in front of a white sheet, the latter being well illuminated, not necessarily by the sun. It will be impossible to get this small object free from fog. The cause is the same; for it is no question of halation, as a similar result would be obtained if, in place of a small object, we selected something long and narrow, occupying, say, all the length and one-fourth of the breadth of the plate. The fog will not be confined to the margin of the dark object, as halation effect would give it, but will extend over its whole area. We may say that the instance we mention is by no means the first case that has been brought under our notice. We have before us as we write a group of three figures, taken out of doors, the upper part of the background being a newly whitewashed wall, on the upper corner of which the sun was shining. The whole picture is fogged. We know of another instance, this time in the experience of a professional. He had some photographs of machinery to take, the first series of which were good, while those of a later set were all indifferent negatives, through the presence of this foggy effect. The cause of this difference was found to be the fact that in the interim the originally grimy-looking wall which formed the background of the machines had been whitewashed. Nothing could be done well without recolouring the wall, which next time had an addition of sulphate of iron to the limewash, the resulting yellowish tint giving the necessary lowering of tone.

It is obvious that one important means of providing against such evil effects would be to carefully wipe the interior of the camera, to remove the dusty, fluffy coating, the accumulation of, perhaps, years, which would reflect more light than the pure black of the camera when first received from the maker's hands. Indeed, a covering of black velvet would greatly improve any camera in view of this effect alone, although it is, perhaps, unlikely that the manufacturers will take it up, as at present there would appear to be no demand, seeing that it might be possible for a man to go on photographing for years without experiencing fog from such a cause, while, on the other hand, he might meet it on his very first trial.

We are quite aware of one objection to our theory; indeed, it was at once urged against it when propounded. It is that the same result ought to have occurred in wet-plate days, yet no one has ever mentioned it. This is probably quite true, though we point out that the conjuncture of circumstances leading to this condition is only occasionally met with; but a point of great importance here arises. The surface colour of a wet plate is much yellower than that of a bromide dry plate, hence the light reflected may be sufficiently non-actinic to be incapable of producing this fog by internal camera reflection. This leads to an important suggestion. Would it not be possible for platemakers to tinge their emulsion with a dye of just such intensity as should prevent injuriously strong light being reflected from the surface of the plate, yet should not materially interfere with its sensitiveness? Such an effect might easily be obtained if speed were no object, but we see no reason why the plan should not be adopted with the most rapid plates. Let us strongly advise platemakers to experiment in this direction. We feel assured that plates so prepared would make a real and valuable advance in the quality of the negative of the future.

THE WET-COLLODION PROCESS.

V.—Development of Negatives.

When Archer introduced the wet-collodion process, the developer he associated with its use was pyrogallic acid, but not as it is now employed with dry plates. A three-grain solution of gallic acid had hitherto been the developer for the Talbotype and albumen negative processes, and an admixture of an acid, such as acetic, with it, to a considerable extent was necessary. The development was slow, and a long exposure was required. The first step in the revolutionary direction of shortening of both exposure and development was taken by the joint introduction of collodion and pyrogallic acid, or pyrogallol, as it is with greater propriety sometimes designated. The original developer was composed as follows :—

Pyrogallic acid	2 grains.
Glacial acetic acid	½ drachm.
Water	1 ounce.

This was poured upon the plate, and, mixing with the silver thereon, developed the latent image. With this developer the silver bath was kept in a condition nearly bordering upon neutrality. The image was fixed by hyposulphite of soda. On looking over an album of photographs taken by the foremost men of that period, we find that, as regards quality, they quite equal those of a similar class of subjects done at the present time. The album alluded to is a large bound volume, designated *The Photographic Album for* 1855, among the artists' names being those of Francis Bedford, O. G. Rejlander, Count Montizon, Dr. Percy, Lake Price, Dr. Diamond, Delamotte, Shadbolt, Rosling, Howlett, Hennah, Pollock, Stokes, and others, in all forty-four.

The dimensions of the photographs vary from whole-plate to 12 × 10, and while some are taken by the Calotype or Talbotype process, the greater number are by wet collodion. The comparative rapidity of the two processes are noteworthy. Henry Taylor's charming *Sheltered Nook*, by the former, was developed by aceto-nitrate of silver and gallic acid, after an exposure of five minutes with a landscape lens of twelve inches focus, and a diaphragm eleven-sixteenths of an inch; while those on collodion required a much shorter exposure, *e.g.*, Count de Montizon's *Hippopotamus at the Zoological Gardens*, taken with a quick lens, is recorded as taken instantaneously. This magnificent album forms a valuable connecting link between the paper and the collodion era, especially as full details of process, lens, exposure, and development are given on the facing page of each picture.

By the adoption of the ferrous-sulphate developer the time of exposure with lenses of average rapidity is considerably reduced, and numerous instantaneous views of street scenes, breaking waves, persons taken in mid air while jumping, with others of like nature, are still to be met with. A good formula for an iron developer for negatives is :—

Protosulphate of iron	¼ ounce.
Acetic acid	1 ,,
Alcohol	½ ,,
Water	8 ounces.

A sufficient quantity of this is applied by being poured along one of the margins, and allowing it to flow over the surface. This is ensured by the alcohol. A solution of iron alone will develop the image, but the acetic acid conduces to cleanliness, while, as stated, the alcohol causes it to flow over the surface with oily smoothness. This must not be poured off, but retained on the surface of the plate. In a very brief period the image will appear, faintly at first, but gradually acquiring density. If the development be arrested before the full vigour has been attained, the picture will, if backed with a black material after fixing, be a positive, to the production of which class of image we shall devote a special chapter; but, our object being the production of a negative, the developer must be allowed to remain on until it ceases to impart further intensity. It is then washed off.

Density, should the image be too thin, can be imparted by a variety of methods, such as the application of a fresh quantity of the developer, to which a few drops of silver solution have been added. A popular intensifier consists in pouring over the thin image a three-grain per ounce pyrogallic acid solution, in which has been dissolved two grains of citric acid, and an addition made to it of a few drops of silver from the bath. This rarely fails to impart great intensity to the image, and, when attained, the negative is fixed in a solution of hyposulphite of soda or cyanide of potassium, the former being preferred for negatives and the latter for positives.

It may happen that, for certain special purposes, such as copying line subjects for engraving, a still greater degree of density is desirable. This may be attained by either of the following means: immerse, after fixing and washing, in a solution of bichloride of mercury until the image is white throughout; wash well, and then immerse in a two or three-grain solution of cyanide of potassium, which has been nearly saturated with silver. There is a tendency in the photographer to leave it too long in the mercury solution, in order to ensure the greatest possible intensity being obtained, but this has the effect of causing a deposit on the clear lines of the drawing or engraving (the class of subject at present in our mind's eye), which interferes with the vigour of the negative. Now, it so happens, as discovered by Carey Lea, that the cyanide in this system of intensifying exercises a twofold action: it denudes the lines of every particle of deposit, leaving them clear and transparent; while at the same time it blackens and confers great density upon the portions representing the whites, the mercurial deposit being different in each.

Another way is to form a bromide of copper solution by dissolving equal parts, or, more correctly, combining proportions of sulphate of copper and bromide of potassium, and applying to the negative. Follow this, after washing, with an application of a solution of nitrate of silver, which will immediately cause a great blackening of the image.

Neither of these two methods is advisable for intensifying portrait negatives, as they are apt to give a too great degree of opacity. For portraiture, a better intensifier consists in a rather weak solution of sulphide of potassium, which is poured over the surface of the negative, and allowed to remain there until the colour of the image is seen to have become darkened, which may occupy from twenty to fifty seconds, according to the strength of the solution.

After being washed and varnished, the negative is now ready for being printed from.

Before dismissing the subject of negative developers, it is proper to say that it was found by Lea, in 1865, that organic matter, combined with an iron developer, united the advantages of iron and pyrogallic acid—the delicacy and detail of the one and the force of the other One way amongst others suggested for its preparation consists in adding one ounce of sulphuric acid to three ounces of water, and, when cool, dissolving in it an ounce of gelatine, the liquid being kept slightly warm for twenty-four

hours. Iron filings or turnings are added without heating, and allowed to stand for several days. Before filtering, and to make sure that no free sulphuric acid shall be present, throw in half a drachm of acetate of soda, then filter and dilute to fifteen ounces. As stated, this developer combines the advantages of both pyrogallic acid and iron, and does not cause fogging by the mage even when left on the plate for a long time.

DEVELOPMENT IN SEPARATE SOLUTIONS.

We must go back a great many years before we shall reach the earliest process of development in which the alkali and the reducing agent were applied to the plate separately, for, if we mistake not, the very first system of alkaline development was practically on this plan. The plate, after exposure, was flooded with a solution of plain pyro, and then submitted to the action of ammonia vapour, which quickly brought out the image; or, in many cases, especially where tannin or similar substances had been employed in the preparation of the plate, ammonia alone—or at least in conjunction with moisture—sufficed to bring out the picture.

In its earliest form this method of development was, perhaps, not very perfect in its action, nor under control to any really useful extent, although we have, under favourable circumstances, in the days of collodion dry plates, and later still with gelatine, produced very satisfactory negatives by what we may term the "fuming" process. The conditions, however, must be all well known—the character of the plate, the light, the exposure, and, indeed, everything must be such as to combine to produce the result required, without any beating about the bush or modification of solutions, for such is really impossible.

But, although the fuming process may not be practically of any value, the principle of development by separate solutions is capable of useful application, and may, in fact, be called into service with advantage when other methods fail entirely to give the desired results. Thus, using pyro and alkali some eight or ten years ago, we found this plan the only one by which we could, with a particular batch of plates that had been exposed away from home, obtain printing density. The pyro was applied to the films in strong solution, so as to thoroughly impregnate them, and, when the gelatine had absorbed as much as it would, the alkali and bromide were subsequently applied, their proportions being raised as the progress of the development seemed to require. In this manner, the film being supplied with its due quantity of reducing agent, the process of development is conveniently, and in some respects advantageously, carried out by means of the simple mixture of alkali and restrainer, the action going on in precisely the same manner as if the whole of the ingredients were contained in the solution instead of being partly in the film.

One of the chief advantages of this process lies in the power it gives of acting through the whole thickness of the film, with a vigorous developer, with some descriptions of plates, especially those of the more rapid kind—a very important factor to success. Where this condition is a necessary one, if we apply a very strong solution of, say, pyro, with the necessary additions of alkali and bromide, the probability is that the extra energy of the solution is lost before it has penetrated much beyond the surface of the film; but, if the pyro solution of the same strength, but without alkali or restrainer—or, in some circumstances, *with* the restrainer—be allowed to soak into the film first of all, the alkali, when subsequently applied, meets it at the best of its power at all depths of the film, and so the very best result possible, so far as vigour and density are concerned, is obtained.

It is a question whether the advantage is confined to density alone. Some years ago the late Colonel Stuart Wortley recommended for short exposures just the reverse of this plan, namely, the application of the alkali alone to the film before the addition of the pyro and bromide. This unmistakably assists in the rapid production of detail in the case of very short exposures, but it is doubtful whether the patient manipulation would not, in the long run, produce a result as good or better in the ordinary way. The advantage gained is mainly, if not solely, in rapidity of development, but at the expense of a very strong risk of fog, and, with careful treatment, we think the balance is, if anything, in favour of the ordinary development.

With the two-solution development, the reducing agent being first applied, there is, so far as we have been able to discover, no counterbalancing tendency either in the direction of fog or of abnormal restraining action. The time of development is, perhaps, prolonged in much the same manner, and probably from similar reasons, as when the plate is soaked in water before the developer is applied; but careful trials with cut plates have failed to show any retardation of development in the sense of suppression of detail in the portions developed in the "separate solutions." On the other hand, the density, vigour, and clearness of the latter portions of the cut plates have invariably been superior, and in the case of intentionally short exposures the result, given with the separate application of the reducing agent, have as certainly been better than the others, owing to the greater strength of the details.

The one weak point in this method of development when pyro was used was the great proneness of that agent to oxidation and discolouration, especially when in strong solution and in the absence of sulphite or other preservative, all of which more or less have a tendency to slow its action when there is no alkali present. The consequence of this is the discolouration or staining of the gelatine film, and, though there are numerous "clearing solutions" available, none of them seem capable of efficiently dealing with the trouble in this case. With the newer forms of developer, notably amidol and metol, but no doubt equally with hydroquinone and eikonogen, this difficulty is altogether absent, and it seems to us likely that the principle of separate development may with these agents be advantageously revived.

Taking amidol first, we have used this in plain concentrated solution, or, at least, in stronger solution than we should have employed in the ordinary way, namely, eight grains to the ounce of water. This was applied to the plate first of all, and allowed to soak for a couple of minutes, and poured back to its measure. Subsequently a strong solution of sulphite of soda (two drachms to the ounce of water) was employed to complete the development, and in different experiments various additions of bromide, acid, and alkali were tried, in order to test the effect. In a general way, the effect of these respective additions may be said to have been identical with what would have occurred had the whole of the agents been applied at once in the one solution, but in all cases a much stronger and clearer image was obtained than when the one-solution developer was used.

Metol was used in the same manner, being applied to the plate, in the first instance, in combination with sulphite of

sodium and without, the alkali afterwards used being also tried with and without sulphite. So far as we can yet judge, it does not appear to matter much whether the metol first applied is mixed with sulphite or not, but it is absolutely necessary that sulphite should accompany the alkali. For the purpose of preserving the metol, it is, perhaps, advisable to use sulphite; otherwise the results are very similar to those obtained with amidol.

If we look at the matter from the point of view of economy, there will be found a decided saving in this mode of development, for the solution of metol or amidol first applied to the plate is absolutely unaltered, except in volume, from absorption, and so may be used over and over again without any question as to change of action.

Venturesome Photographers.—The late melancholy accident to Professor Marshall, of Owens College, Manchester, on Scawfell, illustrates the risk photographers will often run in order to obtain a picture. Frequently a camera is planted by the amateur in his enthusiasm in positions fraught with the greatest danger, as in the fatal case just referred to, which even a casual examination would show was manifestly unsafe. This unfortunate accident should serve as a warning to all photographic tourists in mountainous districts. Life and limb should always be considered before the "best view."

Comet Photography.—The remarkable value of photography in astronomical work has recently been shown in a singular degree. Comet Brooks (c. 1893) has been of considerable interest to astronomers, and the variations undergone from time to time in the direction and shape of its tail have been closely noticed. From Mr. Barnard's photographic work we learn that he was able to obtain photographs showing a tail fully ten degrees in length, the lens employed being six-inch aperture, of thirty-one inch focus. With the eye, and using an object-glass of four times the light-grasping power, one degree was the utmost range he could obtain.

A Novel Experiment.—The United States Weather Bureau, at the station at St. Louis, is said to be trying a curious experiment, in which photography plays an important part. Each week a large balloon is sent off. In the car are placed registering thermometers, barometers, &c., so that the altitude attained, and the varying conditions of the atmosphere and its temperature are recorded automatically. A photographic camera is also fitted with clockwork to take negatives at certain intervals. Clockwork also regulates the ballast, so that the balloon shall remain in the air for some days. The delicate apparatus is so fitted in a wire cage that it will not suffer injury when the balloon descends. Full instructions are also sent in the balloon to enable the finder to pack it up and return it at once to the station. It will be interesting to learn the result of the experiment, particularly as regards the negatives.

Another Fatal Gas-cylinder Explosion.—On Thursday afternoon last week a cylinder, charged with hydrogen, exploded at the works of the New York Oxygen Company. The telegram states that the shop in which the cylinder was standing and the machinery it contained were completely wrecked. One man, it is stated, was killed, while two others were seriously injured. This is the second cylinder explosion, with fatal results, that has occurred in the States during the last month or so. Excessive cold has a marked influence in increasing the brittleness of iron and steel; therefore it may be worth the consideration of users as to whether they should have their cylinders charged to their full capacity just now, unless they are certain about the character of the metal of which they are constructed. If the cylinder is only filled to two-thirds, say, of what it is constructed to hold, it would, of course, be much safer than when fully charged.

The Light of 1893 in London.—Last year proved to be about the brightest one during the present century. No less than 1686 hours of sunshine were registered by the automatic recorders during the year. This is equivalent to 333 hours, or about twenty-five per cent. above the normal amount—practically an addition of an hour a day the year through. The brightest period was the ten weeks ending May 13, when 472 hours were recorded, or over seventy per cent. above the average. During the last week of this time there were sixteen hours more bright sunshine registered than during that excessively hot week of August. The City has always enjoyed a doubtful reputation as regards light, but the register shows that last April 216 hours of sunshine were experienced, or more than double the average, as against 231 at Greenwich and 244 at Kew. Had the increase in photographic business been in proportion to the increase in the amount of sunshine, most professionals who are now making up their yearly accounts would be thankful.

Patents.—The number of applications for patents during 1893 was no less than 25,102, nearly 1000 more than for 1892. From the weekly list we publish of those relating to photography, it will be seen that our art-science has had its share in increasing the number. Each year the number of applications has increased in about the same ratio as last year over the previous one. The average annual increase for the last seven years has been a little over 1000. It is estimated that about half the patents applied for are completed, and, as 1*l.* is paid with the application, and 3*l.* with the lodging of the complete specification, it will be seen that the Patent Office receives over 60,000*l.* for one year's patents in their what may be termed initial stage. When to this is added the costly renewal and other fees, the sale of publications, &c., it will be noted that the Patent Office is a very profitable department. It is true that concessions have been made by reducing the renewal fees to some extent, but should not the patentee get more value for his money? In the United States, if we remember rightly, a patent is granted for something under 8*l.* English, which endures for seventeen years; but that is not all, for the patentee has some kind of guarantee that his patent is fairly valid. A search is made to see if the thing is novel, or whether it has been done before, in which case the application is refused. Here A may patent an invention one month, and B may patent the same thing a month afterwards, and both patents will be sealed unless the sealing of B's is opposed. Consequently both patentees find themselves involved in costly litigation to sustain their supposed rights. This is what a Patent Office should take some means to prevent when a patent is granted.

A PHOTOGRAPHERS' COPYRIGHT UNION.

It may be remembered that in the Journal for November 17, 1893, we drew attention to a circular referring to a meeting of photographers, held with the object of coming to some agreement as to making a charge to the illustrated papers for the use of copyright photographs for reproduction purposes. A formal resolution imposing a *minimum* charge of one guinea was agreed to by about twenty of the principal London and provincial photographers. On that occasion we suggested that these gentlemen should give the whole of their brethren an opportunity of participating in the movement. We are now happy to announce that steps are being taken to invite all photographers throughout the country to form themselves into a Photographers' Copyright Union.

Furthermore, as the result of several meetings of the Committee appointed by the photographers above alluded to, it has been found practicable to work under the auspices of the London Chamber of Commerce, which, as some of our readers may not be aware, already has a Photographic Section, in connexion with which the Photographers' Copyright Union will, we gather, in future be administered.

On Monday last, at the rooms of the Chamber of Commerce, Mr. Frank Bishop presided over a meeting of the Committee and others, called for the purpose of giving publicity to the formation of the Union. The Chairman, after some introductory remarks, said it had now been decided to appeal to all photographers to join the Union, and he trusted that the photographic press would assist it. A photographer's copyright was a property which ought to be paid for like every other property. They knew that the illustrated press and some publishers had for some time been making use of those copyrights, and had never paid for them. Many of the illustrated papers depended largely on reproductions of photographs in some form, and it was therefore to the interest of those photographers possessing copyright photographs to join together to protect themselves. They did not propose to say to any photographer what he should charge; they simply asked him to agree not to give permission for the reproduction of a copyright photograph for a sum less than 10*s.* 6*d.* The more they could get above that the better. A circular to that effect (see below) would be sent to every photographer in the Kingdom to the number of about 3400. They did not call upon photographers to contribute anything towards the expenses. All they asked was that photographers should agree to the objects of the Union, sign the circular form and return it to the London Chamber of Commerce. Mr. J. J. Elliott (Elliott & Fry) had been at considerable trouble in compiling a small pamphlet on *Copyright*, which had been examined by a legal expert, and could therefore be taken as correct, and as a guide to any photographer. This pamphlet would be sent to all photographers gratis.

We append the circular referred to by the Chairman :—

"THE LONDON CHAMBER OF COMMERCE (INCORPORATED),

"*Botolph House, Eastcheap, London, E.C., January* 9, 1894.

"PHOTOGRAPHIC SECTION.

"*Photographic Copyright Union.*

"DEAR SIR,

"In view of the increased use of photographs in the formation of process blocks and in other photo-mechanical processes now adopted by publishers and the illustrated press, it has been found necessary for photographers to come to some agreement amongst themselves to protect their interests in their *copyright* publications. To this end several preliminary meetings have been held by many of the London photographers, and they now appeal to all their brethren in the profession to co-operate in this movement.

"After several meetings, it has been resolved to recommend the following final resolution for the acceptance of the profession :—

"RESOLUTION.

"*Proposed by* by Mr. J. J. ELLIOTT. *Seconded by* Mr. VAN DER WEYDE.

"'That this Meeting, taking into consideration the generally expressed views of their friends on the Press, that the minimum fee of one guinea for use of their copyrights should be reduced, agree to meet these views by fixing the *minimum* at the nominal sum of half a guinea for the use of each subject, for one issue only, that the name and address of the photographer be printed legibly under each print, and that permission must first be sought and obtained before any copyright photographs could be made use of.'

"This resolution has already been communicated to the London illustrated papers, and has been generally accepted; it therefore only remains for those who possess *copyright* photographs to avail themselves of their right to charge a fee, in addition to securing the publicity hitherto accorded.

"We confidently ask you to join the Union, which you may do without incurring any expense whatever, and we would ask you to please sign the annexed form and return same to the above address.

"Committee { FRANK BISHOP (Marion & Co., Soho-square). WM. DOWNEY, jun. (W. & D. Downey, Ebury-street). JOSEPH ELLIOTT (Elliott & Fry, Baker-street). ALFRED ELLIS (Baker-street). WM. GROVE (Window & Grove, Baker-street). J. LILLIE MITCHELL (London Stereoscopic Company).

N.B.—When a sitting is given to a photographer without payment, *the copyright vests in the photographer from the moment the negative is taken. It is true the requirements of the Act are not complete until the work has been registered at Stationers' Hall, but this may be done at* any time after publication.

Upon registration, the owner of the copyright is entitled to avail himself of all the statutory remedies against any person reproducing the photograph, that is to say, he may get damages or penalties, an injunction to restrain the reproducer from using the copyright in any way, and an order for the delivery up of reproductions unlawfully made.

When, however, a person sits to a photographer and pays *for his photographs, the Copyright does* not *belong to the photographer, and he cannot charge a fee for reproducing.*

The following is the form of agreement which photographers are asked to sign :—

"PHOTOGRAPHIC SECTION OF THE LONDON CHAMBER OF COMMERCE.

"BOTOLPH HOUSE, EASTCHEAP.

"*Photographers' Copyright Union.*

"I hereby agree to adhere to the principles and rules of the Photographers' Copyright Union, as set forth in the circular letter accompanying this form, dated January 9, 1894, addressed to me by the Committee of the above Union upon the understanding that by so doing I incur no expense.

"Name _____

"Address _____

"Date _____ 1894."

In the course of a brief discussion which followed Mr. Bishop's address, it was elicited that the *minimum* fee of 10*s.* 6*d.* should be charged for the *minimum* reproduction and size, and that, in fact, users of the copyright picture should pay according to size of reproduction. The use of the block should be confined to the paper for illustrating purposes, otherwise penalties could be obtained. As regards alterations in the existing law of copyright, Mr. Kenric Murray, the Secretary of the London Chamber of Commerce, said several meetings on the subject had been held by the Photographic Section, and that, when opportunity served, Lord Monkswell's Bill, with certain modifications, would be reintroduced into Parliament. That Bill covered music, printing, &c. As regards the retrospective action of registration in copyright, the Chairman pointed out that, by deferred registration, a certain sacrifice in the way of recovering penalties was made. The President (Mr. Fall), and the Secretary (Mr. D. J. O'Neill), of the National Association of Professional Photographers, were present at the meeting, and said that the Association would be pleased to help the Union in its objects. The offer was accepted by the Chairman.

We need hardly say that, for our part, we have great pleasure in responding to the appeal of the newly formed Union for all the assistance that publicity in our columns and sympathetic support can afford. Great praise is due to the Committee above named, of whom, we believe, Mr. J. J. Elliott, Mr. Frank Bishop, and Mr. Downey have been at much trouble in the matter, in taking the initiative in the formation of the Union. That Union has been urgently wanted. Photographers all over the country have, for a long time past, submitted to the infringement of their copyrights by the illustrated press, without, through various circumstances, being able to apply a remedy, while over and above this the growth, popularity, and cheapness of photo-reproduction processes has, in all probability, permanently injured what with many was once a lucrative branch, namely, publication work. By combining together for protective purposes, the whole photographic profession will in future be the better able to enforce its rights in the matter of copyright photographs, and we are inclined to think that additional good of another nature will also accrue to a much-harassed profession in various ways. To our professional readers, therefore, we unhesitatingly say, Join the Photographers' Copyright Union, and sign the circular agreement form sent you. It will cost you nothing; it may, and probably will, bring you in something.

HURTER AND DRIFFIELD; OR, THE MEN AND THE MONEY BAGS.

BEING AN ATTEMPT TO FORM A BASIS OR THEORY FOR WORKING IN DEVELOPMENT SO FAR AS IT AFFECTS THE GRADATIONS IN OUR NEGATIVES, FOUNDED UPON THE RESEARCHES OF HURTER & DRIFFIELD.

[London and Provincial Photographic Association.]

THERE are two points which have to be considered in respect to gradation, the first being the range of gradation (by which is mean

the difference between the lightest and darkest tones), and the second the consideration of intermediate tones. We will, for a few moments, confine our attention to the first of these points, *i.e.*, the range of gradation.

What is Range of Gradation?

As you all well know, the range of gradation in the subjects we photograph varies very greatly—from broad sunlight to heavy shadows in many of our landscapes, and from the hardly distinguishable yellow to grey of a faded copy.

Now, the possible range in our negatives is almost as wide and variable as that in the subjects. But the range in our prints is more limited and more uniform, being comprised in the difference between white paper and the darkest tone of the pigment forming the print.

With any particular printing paper, it is found that a certain fixed range of gradation is required in a negative, if all its gradations are to be impressed on the paper. To illustrate clearly what I mean, I have here a sample of gelatino-chloride paper, portions of which have been exposed to light, so that we get a series of tones from black to the lightest tone. Now, to turn this paper black, required about thirty times the exposure necessary to tint it the lightest tone, which, as you see, is only just distinguishable from white. It is evident, therefore, that any range of gradation in a negative, greater than thirty to one, will only be partially rendered in the paper, as any longer exposure than thirty times cannot make the black paper any blacker, and any exposure less than one does not produce any visible tone whatever. It stands to reason, then, that to produce a print which will bring in all the details and tones of the subject, it is necessary that the range of gradation in the negative must not exceed about thirty to one.

If we print with a negative which has a greater range, the extreme tones cannot all be produced in the print. If we print lightly we shall fail to obtain the lightest tones, which will simply appear as a patch of white. If we print deeply, we shall, of course, be able to bring out the light tones, but, in doing so, the dark tones will have merged into a patch of black; but, while it is thus necessary to limit the range of gradation to about thirty to one, it is usually desirable at the same time that the negatives should not contain a much lower range than this, for the result of printing from a negative of smaller range will be either an absence of white or an absence of black, according to whether the printing is heavy or light. In a medium print there would, of course, be neither white nor black.

Variation of Gradation in Development.

I have mentioned the popular process of Gelatino-chloride, but there are, as you know, almost innumerable printing processes, and I should explain that the results produced from a given negative are found to vary considerably, according to the printing process employed. This is mainly because the different processes require a different range of gradation in the negatives to give the best results. For example, in photogravure one to eight is found ample, while in photo-lithography one to 200 is not too great. And so we come to one of the chief requirements in developing, which is that, no matter what the range of gradation was in our subject, and no matter what the exposure has been, we want in our negative a range of gradation suitable to our printing process. In other words, we want to squeeze up the gradations in some cases, and widen them out in others.

Let us now see how far this may be accomplished. We have on the screen a surface graduating evenly from white to black, which we may suppose is being photographed, and the correct exposure being known, the operator has exposed some plates for the correct time, and under exactly similar conditions, and he is going to develop these plates separately, to ascertain what alteration in the gradations he can obtain by modifications in developing.

Now, the first obvious variation in development that can be made, consists in deciding at what stage it shall be stopped, and we very soon find that this exerts an enormous influence on the range of gradation.

Let us take *three* cases. In the first place, we will take one where the development has been stopped at an early stage, and will compare this with one in which development has been carried to the correct stage.

You see the result of under-development. In this picture the range of gradation is too small, or (as we say in common parlance) the print is flat. The effect of over-development, on the other hand, is, that the original is again falsified, but in the opposite way; that is to say, we have a patch of white, or a patch of black, or both, owing to the range being greater than can be reproduced in the print, and we say the print is hard and chalky. In order to clearly understand the reasons for these different results, and to appreciate the great importance of stopping development at the right moment, it is necessary for us to resort to figures.

But we photographers are not much accustomed to working out mathematical problems, and therefore I will, as far as possible, resolve this question of abstract figures into the form of a concrete example, and, instead of dealing with numbers only (which do not, perhaps, convey very definite meanings to some of us), we will take into consideration certain sums of money, and, instead of logarithmical ratios, we will simply consider that these sums of money have to pass through the hands of certain men, each of whom deducts ten per cent. commission of the sum which reaches him.

The Men and the Money Bags.

On this diagram I have represented the respective results of correct development, under-development, and over-development. If you will kindly give your patient attention while I deal with this question of men and money for a few minutes, you will be in a position to recognise the enormous effect which the stage at which we stop development exerts on the range of gradation in our negatives. Let us deal with this left-hand table first. The sum of 100*l.* passes through the hands of one man, who deducts ten per cent., which, of course, leaves 90*l.*

Diagrams.

1.

£100	100	100	100	100	100
1	2	3	4	5	6 men

£90 = 2 to 1 (nearly) = 51

2.

£100	100	100	100	100	100
5	10	15	20	25	30 men

£58 = 38 to 1 = £1 : 10 : 0

3.

£100	100	100	100	100	100
9	18	27	36	45	54 men

£38 = 114 to 1 = £0 : 6 : 8

In the second column the 100*l.* passes through the hands of two men. Now, the first of these two takes the commission of ten per cent. out of the 100*l.*, and passes the residue of 90*l.* to the second man; he in his turn takes his ten per cent. of this 90*l.* (which is, of course, 9*l.*), and this leaves a residue of 81*l.*

Similarly, in the next instance, we find three men extracting their pound of flesh, the third, of course, taking ten per cent. of the 81*l.* left by No. 2, and so we go on until we come to the last case, where there are six men to be squared, and in this case the 100*l.* becomes reduced to 51*l.*

What I want us to recognise is the difference which exists between the first and last instances—that is, between 90*l.* and 51*l.*, the proportion being, as you see, nearly two to one. Let us now suppose that, this agency business having turned out so profitable, it is found necessary to enlarge each firm, so that on going to the first firm again we find that there are five partners in the business, the senior partner taking his 10*l.*, the second his 9*l.*, the third 8*l.*, the fourth 7*l.* 6*s.*, and the fifth 6*l.* 11*s.*, leaving 58*l.*; each partner taking ten per cent. of what the other leaves. In the second case, where the firm has been enlarged to the same degree, ten commissions are extracted, and in the last case as many as thirty commissions have been deducted, which reduces the 100*l.* to 30*s.* You will notice that the proportion of the number of men in both cases is the same—that is to say, that one to six is the same proportion as five to thirty; but when we look at the money results we find that the ratio between ninety and fifty-one is very different to that between 58*l.* and 30*s.*—that is to say, that, instead of a difference of two to one, we have now a difference of nearly thirty-eight to one.

In our third example, the firms have grown to nine, eighteen, twenty-seven, forty-five, and fifty-four partners respectively, and the deductions by these partners leave a remaining sum by the first firm of 38*l.*, and by the last firm a lawyer's fee of 6*s.* 8*d.* only, the proportion between the two sums being no less than 114 to one.

I hope this simple consideration of money matters is quite clear

to you; if it is not clear to any one, I would ask him to make a sketch of this diagram, and think it over at leisure.

Variations in Development.

Let us now apply this reasoning to the case of our negatives. You will remember that I showed you just now, by three slides, the effect of stopping development at three different stages.

In the case of each negative, we have the men represented by the different quantities of silver distributed over the plate, and we have the money which succeeds in evading their pockets represented by the quantity of light which reaches the print through the negatives, or, to put it in another way, we may say that the amount of light intercepted by the negatives is identical with the commissions deducted by the men.

Thus, in the first case, we have, on the under-developed plate a small number of silver particles forming the image, and the proportion between the quantity of light transmitted by the least and most opaque portions is less than two to one. In the second case a greater amount of silver is set free by the developer, and, although the proportionate quantities are the same as before, the proportionate quantities of light transmitted are very different, being thirty-eight to one, instead of two to one. Again, in the third case a still larger deposit of silver occurs, also in the same proportion, but the ratio of light transmitted is now greater still, or 114 to one.

These figures illustrate the power the operator has of widening or narrowing his range of gradation by stopping development at different stages; it also shows the great importance of stopping development at as near as possible the precise moment the requisite range of gradation is obtained.

It is obvious, on inspection of our diagram, as also by the slides I showed you, that the intermediate tones vary in exactly the same ratio as the extreme tones. So that if the range of gradation is incorrect, the intermediate gradations must also be incorrect.

I will now point out to you that there is a certain limitation to the increase in the range of gradation during development, a limit which varies according to the thickness of the film. In using a thinly coated plate, the high lights soon become reduced through the whole thickness of the film, and the development, so far as these high lights are concerned, is necessarily stopped, but the development of the half tones and shadows, if the exposure has been sufficient, goes on, and so the silver in these parts of the film increases and the range of gradation diminishes. E. Howard Farmer.

(To be concluded.)

A REMEDY FOR OVER-EXPOSURE.

The gelatino-bromide process, admirably simple as it is, and capable, as it has been shown, of producing in skilled hands results equal to the finest work of the wet-plate practitioner, is, nevertheless, attended with certain drawbacks which, judging by the number of the remedies that are from time to time proposed, seem as fruitful as ever in annoyance to the dry-plate photographer.

Among these—perhaps the principal, certainly the most frequently occurring—is the difficulty of obtaining a correctly exposed plate. Many causes contribute to this. With plates of the extreme sensitiveness commonly employed, it is often next to impossible to form even a roughly accurate estimate of the exposure required in cases where the quality of the light is liable to extreme variation. This is especially so in landscape work, and in all cases where the exposure required is practically instantaneous.

At the present day we hear little of under-exposure. This is, of course, attributable to the fact that the plates in ordinary use are too rapid to permit of any error in that direction. There are, indeed, certain subjects, such as dark interiors, and the like, in which it is possible to under-estimate the time of exposure; but these, being exceptional cases and capable of being readily remedied, are comparatively unimportant. Over-exposure, on the other hand, is exceedingly common. Where commercial dry plates of the average rapidity are employed, it is probably not over the mark to say that nine out of every ten of the negatives produced thereon will, on examination, be found to show signs of over-exposure. In some, no doubt, a close approximation to the required exposure will have been made, and the effect produced by the trifling excess will be almost imperceptible. Comparison with a correctly exposed negative will, however, generally reveal the fact that such an over-estimate has been made.

Seeing, then, that it is hardly possible to do more than make a rough guess at the proper exposure, one might expect to find in existence some simple remedy for a state of things of almost daily occurrence in the practice of the field photographer.

This, however, is not the case. The recognised remedy, the usual series of elaborate variations in the proportions of the developer, the usual complication of halving one thing, doubling another, and adding very carefully a drop of a third, may be in some instances effectual, but certainly cannot be said to be acceptable on the score of simplicity. Were it possible to conduct the development of the plate in ordinary daylight, it is probable that success might generally follow these operations; but, things being as they are, the result is usually anything but satisfactory to the conscientious operator. Add to this the likelihood that he may be simultaneously employing plates by several different makers, each brand requiring its own particular developer, and it will be readily admitted that out of such confusion little resembling a properly exposed and properly developed negative is likely to appear. What seems to be required is a remedy of a simpler character, a remedy suitable for immediate use, a remedy that shall act in such a uniform manner as to be, to all intents and purposes, as applicable in total darkness as in the dim and uncertain light of the dark room.

No apology seems, therefore, needed for bringing under the notice of photographers a cure for over-exposure which the writer has found to be very effectual, and which, moreover, possesses the additional recommendations of cheapness and simplicity.

It is a well-known fact that the halogens, chlorine, bromine, and iodine are capable of replacing one another in the various compounds which all three form individually with the metallic elements. This displacement is not arbitrary, but takes place according to what is, so to speak, a certain definite precedence. Iodine existing in the molecular or combined state, as, for example, in the form of a metallic iodide, is displaced by bromine, whilst the latter, when itself united with a metal, is displaced by the element chlorine. Iodine, the weakest of the three, is also displaced from its compounds by chlorine without the intervention of the intermediate halogen.

The process about to be described is based upon the second of these reactions, namely, the displacement of bromine from its compounds the bromides by the action of chlorine.

Twenty-five grains of manganese dioxide are placed in a small stoppered glass retort, and a drachm and a half of concentrated hydrochloric acid is cautiously added through a glass funnel. After closing the retort and well shaking the contents, a very gentle heat is gradually applied. Chlorine gas is evolved, and is absorbed by being led into a wide-mouthed bottle containing one pint of ice-cooled water. The process should be continued until the water is saturated with the gas. This stage is indicated by a continual stream of bubbles rising to the surface, when the free chlorine escapes into the air. The saturated solution should then be diluted with an equal bulk of cold water. If kept in a well-stoppered bottle in a dark place, the solution will remain unaltered for a considerable time. Care must, however, be taken that it is not exposed to the action of sunlight, or even to that of diffused daylight, otherwise it will begin to decompose, the chlorine uniting with the hydrogen of the water to form hydrochloric acid, whilst the oxygen is given off in the free state.

On account of this tendency to decomposition, the writer has found it advisable to cover the outside of the bottle with a coating of thick brown paper as a protection against the effect produced by the actinic rays. The treatment of the over-exposed plate is as follows:—A few ounces of the chlorine water (diluted as above) having been poured into a porcelain developing dish, the plate is immersed in the solution. It is allowed to soak from one to three minutes, the time varying according to the suspected extent of the over-exposure.

The free chlorine acts upon the sensitive film, liberating part of the bromine of the silver bromide, and forming in its place a thin surface coating of silver chloride. The plate is thereafter removed from the solution, allowed to drain for a few seconds, and placed in a bath containing pyro developer of such strength as would have been employed had the plate received a correct exposure. In the course of a few minutes an image will gradually be formed in the body of the gelatine film. It will be visible only by transmitted light, on account of the surface-layer of chloride, which, being unacted on by the solution, forms a sort of translucent veil which conceals the process of development. The operation, however, being a very gradual one, will be found to be perfectly under control. When sufficient density has been obtained, the plate is rinsed in water, and placed in the fixing bath. The unreduced chloride will gradually dissolve, and a new surface take its place, the image at the same time becoming visible.

The finished plate will be found to exhibit all the characteristics of a correctly exposed negative. The colour, however, will bear some resemblance to that obtained by the collodion process, whilst the gradations of light and shade will prove to be more delicate than those usually obtained on a dry plate. This arises from the considerable reduction effected in the thickness of the film.

Provided that the over-exposure be not excessive, plates treated in this manner will be found to give very satisfactory results.

Two experiments, made with the object of comparing the effects produced by medium and extreme over-exposure may be here briefly described.

A slow gelatino-bromide plate was exposed under a negative to the light of a gas flame one foot distant for forty seconds. A duplicate was afterwards treated in the same way. As the proper exposure had been found by previous experiment to be nearly twenty seconds, the plates had thus received twice the proper exposure.

The first plate was, without preliminary treatment, developed in ordinary pyro for two minutes. The result was a dense positive, showing unmistakable signs of moderate over-exposure. The second plate was soaked in the chlorine water bath for six minutes, removed, drained, and placed in the developing solution at the same time as the first. The development proceeded very slowly, fully twenty minutes elapsing before sufficient density was attained. After fixing, the image was found to be somewhat thin (having been too long in the chlorine water), but beautifully clear, and as perfect in the due balance of light with shade as could well be desired.

The effect of the remedy as a cure for excessive over-exposure was then tested. A third plate was exposed under a negative to diffused daylight for ten minutes. The over-exposure in this case amounted to fully one hundred times the true exposure. The plate was then soaked in the chlorine solution for five minutes, and developed for ten minutes in pyro developer of normal strength. The result was a rather weak image, perfect in every detail, but exhibiting very decidedly that monotonous blending of light and shade so characteristic of an over-exposed plate. Such an instance of excessive over-exposure is, of course, one unlikely to occur in ordinary practice; and for cases in which the error in exposure does not exceed, by more than four or five times, the interval actually required, the remedy will be found to produce uniform and highly successful results. There are two important conditions that seem essential to the successful working of the process. In the first place, on account of the considerable reduction which takes place in the thickness of the film by the dissolving out of the unaltered chloride, it is advisable to employ rather thickly coated plates. It is, indeed, possible to secure fairly good results even with thinly coated plates, provided the time of immersion in the chlorine solution be proportionally diminished; but, in order to secure a negative of the best quality, it is necessary to employ a film of such a thickness as shall, after the preliminary soaking, retain sufficient bromide of silver to produce the proper degree of density.

In the second place, it is very important that the immersion in the reducing bath should not be prolonged beyond what is absolutely required. Over-soaking will inevitably produce thinness in the image. In cases of slight over-exposure, an immersion varying from thirty seconds to one minute should be given; in more serious cases two minutes will be found sufficient, whilst in exceptionally severe cases the action may be prolonged to three minutes, but should not be allowed to exceed that interval.

Should the development proceed too slowly, a slight yellow tinge may be perceptible in the negative after fixing. This may be removed by treatment in a bath of alum and citric acid solution. It is, however, after a little practice, very easy to estimate the amount of preliminary soaking in the reducing bath required to ensure that the development shall proceed briskly.

Images produced by this process exhibit a peculiar sharpness of detail, combined with a remarkable clearness in general appearance, qualities which render it serviceable for certain classes of work. It will be found valuable for the production of lantern slides, glass positives to be used as transparencies, and negatives of maps, engravings, and letterpress work.

Throughout the series of experiments conducted by the writer, the one single developer (pyro and ammonia) was employed. There seems, however, nothing unlikely in the supposition that equally good results might be obtained with other developers. The preparation of the chlorine water is the only part of the procedure which presents the least difficulty. The slight trouble that this involves may, perhaps, deter the majority of photographers from making a trial of what is in other respects a very simple process. For their benefit, another and simpler method of preparing chlorine water may be described.

Common bleaching powder (calcium hypochlorite) is placed in a tubulated glass flask of the sort ordinarily employed in experiments with gases. Dilute sulphuric acid is then cautiously added through the funnel tube. Chlorine gas is rapidly evolved without the necessity of heating, and is conducted by the bent leading tube into a glass receiver containing cold water. This method of preparing the gaseous solution will be found to require less attention than the former. It should, however, be conducted in the open air, as, owing to the extreme briskness of the action, fumes of chlorine are more readily produced than is the case when the evolution of the gas is due to heat. The other method, on account of its being more under control, is to be preferred when operations are conducted indoors. Whatever be the mode of its preparation, the solution will be found quite reliable in regard to its keeping qualities, provided the necessary precautions for the exclusion of air and of light already mentioned be carefully observed.

The writer has also found that the strength of the solution permits of it being used, not once only, but several times, in cases where the over-exposure of the plates successively immersed does not require more than a few seconds to one minute of treatment in the reducing bath.

When the odour of chlorine ceases to be distinctly perceptible (a sign that the activity of the bath is exhausted), the solution should be rejected, and a fresh supply prepared.

Provided that the manipulations are conducted with that amount of care which should attend all operations with highly sensitive films, photographers will find in the chlorine water remedy qualities in which the commonly accepted cure for over-exposure is lacking. Considered from a purely theoretical point of view, the process is well worthy of the attention of all students of photographic chemistry; whilst, viewed from a more technical standpoint, its cheapness and simplicity, as well as the uniformity of the results obtained, impart to it not a little practical value.

On these and other grounds it should recommend itself to many who have felt the difficulties attending the more usual treatment for over-exposure.

MATTHEW WILSON.

REMARKS ON ALBUMEN AND GELATINE PAPERS.

Now that the prestige of albumenised paper is being so sharply attacked by the gelatino-chloride preparations, it may be worth while to turn our attention more attentively to its usefulness as well as to its faults and shortcomings. For my part, I believe albumen paper will retain a position of importance in all businesses where much varied work is undertaken and silver printing processes are used, possessing, as it does, an adaptability that gelatine papers, so far, do not. It is, of course, impossible to predict the perfection to which these papers may be brought; but, at the present time, there are undoubtedly restrictions in their use in several directions that will not apply to albumenised paper.

A great advantage in working albumen is that, no matter what quality of negative is used, providing it will give a good result with any process, at least a moderately good result may be obtained on it, due attention being given to the salting and sensitising. Even when printing is restricted to the ordinary ready-sensitised paper, better printing can be had from a dense, hard negative than on its rival. Where the new paper specially has the advantage is in rendering delicate detail, conferred in a great measure by its surface being free from granularity or roughness. In albumen paper this smoothness is seen when the wet print is squeegeed to glass, but when dried in the usual manner there is an undoubted roughness that interferes with the *perfect* rendering of the delicate gradations of the negative *in comparison* with gelatine; however, this varies in degree according to the quality of the paper.

A skilful printer using the best quality of albumenised paper will get from a good negative prints equal to any other process, if they are mounted in optical contact with glass or enamelled, but for many negatives this excessive smoothness is not required, is, in fact, better absent: another thing, it is not always convenient to mount prints in optical contact with glass or to enamel them. Then, no doubt, the gelatine paper has an advantage, as the more delicate details in the shadows of the negative are better rendered; but the chief point gained over albumen paper, *as we generally get it*, is the *ease* with which *flat, poor negatives* can be made to give brilliant prints. We will concede the point, and for working such negatives it is a power in the hands of the photographer not to be despised; but it is astonishing what excellent results may also be had with albumen if it is scientifically manipulated with especial respect to the strength of the salting and silver bath, and *exposure to the right quality of light.*

It will take a great deal to beat a thoroughly good albumen print—setting aside the question of permanency—and we have yet to learn if any of the new *silver* processes are better in this respect, a thing I very much doubt. We have undeniably a splendid process in the gelatino-chloride papers, but it encourages the making of poor, weak negatives; and poor, weak negatives have, ever since the first, produced less permanent results than strong, brilliant ones. Will this be

an exception to the rule? We shall see what we shall see after a few years have passed; in the mean time, in order to improve the surface, is there any objection to the use of an *enamelled paper* instead of the usual plain Rives and Saxe for the reception of the albumen coating? Would it give rise to blisters or act contrary in any other way by interference with the toning, or the film slipping off bodily in the different solutions to which it would be submitted? If it would work all right, we should at once get rid of roughness and granularity, and, I have no doubt, get an increase of the delicate detail that is such a recommendation in gelatine papers. Gelatine enters into combination with silver much more readily than albumen, but whether to the advantage or disadvantage of the results I cannot say; it may possibly leave more unstable combinations in the finished print than when the silver is combined with albumen, the effects of which will show after the lapse of some little time. Then, again, sulphur toning has always been decried as dangerous to permanency, a dictum I cannot accept without considerable allowance, as sulphur-toned prints are in existence as good now as when they were made forty years ago. When sulphur toning is pernicious is when the negatives are very thin and poor, so that the light does not have the opportunity of exerting its full power in the formation of the image, and when the fixing is imperfectly performed. How do we stand now in this respect? The average run of negatives are exceptionally thin, or flat, and *print rapidly;* sulphocyanide toning is adopted either alone or in combination with acetate of soda. Anyway, sulphocyanide is *the* chemical most popular, and, if prints toned with it *last,* nothing can be said in its disfavour, as the colours produced are exceptionally pure and good. Time is, however, the factor that will decide this matter, and I must confess I have some misgivings on the subject. Anyway, a *good* albumen paper is not to be despised. We know its faults and shortcomings, and how to avoid most of them; if half the intelligence had been bestowed on printing formerly as new processes get now, the opinion so freely expressed about the faults of albumen paper would have been considerably modified.

Long soaking and washing has been and is *very* detrimental to brilliance and permanency; although this was pointed out years ago, it has rarely been acted on systematically. That bugbear idea of "getting rid of the hypo" has stood in the way of short sharp washing; if getting rid of the dangerous silver salts by *effectual* fixing had been as persistently advocated, more permanent results would have been secured; a trace of hypo left in the prints at the end of the process would not matter much to judge from the results of carefully conducted experiments—I should say, would not matter at all. Then, there is infinitely less trouble in mounting and dealing generally with the finished proofs on albumenised paper, they will bear rough handling with an impunity that would quite spoil the gelatine surface and tone to a rich colour with considerably less gold, leaving the toning solution in good order for an unlimited period. Comparing the two, we have had so much more experience with albumen that possibly on better acquaintance with gelatine prepared papers their absorption of the noble metal will be reduced considerably. Again with albumenised papers, the recovery of gold and silver from the washing and fixing equals *at least* 70 per cent of the amounts of metals used which must be taken into consideration in counting the cost. What the residues are worth from a corresponding amount of gelatine papers I am unable to say, but I scarcely think would be up to this average; any way, from a commercial aspect, it is important to know.

However, it is rather to the working and appearance of the prints as compared together than the expense of production that I am desirous of calling attention. There is something very fascinating about a thoroughly good print on gelatine and there is nothing surprising in the popularity it has attained in so short a time, especially in the production of small pictures, but for larger work I certainly give the preference to our old friend albumen on nearly all counts.

The matt-surfaced gelatine paper is a step in the right direction, and, providing we can ensure their non-yellowing, gelatine papers, as far as appearance goes, will leave nothing to be desired.

It may be said this is the difficulty with albumen, and no doubt hundreds and thousands of prints have gone bad; but I am firmly of opinion it is not the fault of the process at all, but of the workers, and there would be no yellowing if the paper was good and the fixing thorough, the two essentials of permanence. EDWARD DUNMORE.

A FEW FACTS RELATING TO PHOTOGRAPHIC COPYRIGHT.

(Issued by the Photographers' Copyright Union.)

A FEW plain facts concerning the law of copyright as relating to photography according to the Act of 1862, intituled, "An Act for Amending the Law relating to Copyright in Works of the Fine Arts, and for repressing the Commission of Fraud in the production of such works."

Paintings, drawings, and photographs are included under the same head.

Copyright is the exclusive right of multiplying copies of a published work. This right is entirely regulated by statute.

The author of every original photograph has the exclusive right of copying, reproducing, and multiplying such photograph by any means, and of any size, for the term of his natural life, and the right holds for seven years after his death.

The author of a photograph is he who actually arranges, lights, and poses the sitter.

If, however, the photograph is taken for the photographer by an assistant, the assistant is the author of the work, but not the proprietor of the copyright; for, when the author of a work is a person employed at a salary, then (where no consideration is paid by the sitter) the copyright in the photograph vests in the employer, as being made "for and on his behalf for valuable consideration," namely, the salary paid by him to his *employé*. This point was conclusively settled by Lord Justice Brett (now Master of the Rolls) in the case of Nottage *v.* Jackson.

When a sitting is given to a photgrapher without payment, the copyright vests in the photographer, and the sitter cannot restrain the sale of the photograph, for *from the moment when the negative is taken it is the copyright of the photographer.* It is true the requirements of the Act are not complete until the work has been registered, but this may be done at any time before or after publication.

Upon registration, the owner of the copyright is entitled to avail himself of all the statutory remedies against any person reproducing the photograph; that is to say, he may get damages or penalties, an injunction to restrain the reproducer from using the copyright in any way, and an order for the delivery up of reproductions unlawfully made.

When, however, a negative of a photograph is executed for any person who pays for the same, the person executing it will *not* retain the copyright unless it be expressly reserved to him by agreement in writing, signed by the person for whom the same is executed. In other words, when a person sits to a photographer in the ordinary way, and pays for his photographs, there is no copyright unless it is conferred upon the photographer or sitter by agreement, and although the negative is the property of the photographer, he is not allowed to sell, multiply, or exhibit copies of the photograph without the consent of the sitter.

Before the statutory remedies can be enforced, however, by the sitter, he must register at Stationers' Hall; but, in the event of the photographer making improper use of a private sitter's photograph, the sitter has a remedy. In proof of this I cite the following case, Pollard *v.* the Photographic Company.

The defendant company, who had been employed by the plaintiff's wife to take her photograph for value, were restrained from selling copies of the photograph without her consent, or exhibiting it as an advertisement. The plaintiff had neglected to register the photograph, consequently he could not enforce his copyright under the Act of 25 & 26 Vic., &c.

Mr. Justice North, however, who tried the case, ruled as follows:—"The question is, whether a photographer who has been employed by a customer to take his or her photograph is justified in striking off copies for his own use, and selling and disposing of them, or publicly exhibiting them by way of advertisement, without the authority of such customer, either express or implied (I say 'express or implied,' because a photographer is frequently allowed, on his own request, to take a photograph of a person under circumstances in which a subsequent sale by him must have been in the contemplation of both parties, though not actually mentioned). To the question thus put my answer is in the negative, that a photographer is NOT justified in so doing!! In my opinion, the photographer who uses the negative to produce other copies for his own use without authority *is abusing the power confidentially placed in his hands* merely for supplying the customer; and, further, I hold that the bargain between the customer and photographer includes by implication an agreement that the prints taken from the negative are to be appropriated to the use of the customer only."

It is advisable to register a copyright picture as soon as possible after the photograph has been approved by the sitter, and care should be taken to register correctly; if the photograph has been taken by an assistant, his name should be inserted as "author," but, if taken by the proprietor himself, of course his name should be given both as author of the work and proprietor of the copyright: It is also advisable to paste a rough photograph on the form for identification, in addition to a minute description of the work.

I am of opinion that copyright photographs should in every case be mounted on cards bearing the word "copyright," and by no means should private pictures be mounted on copyright mounts.

I also think it is unfair to endeavour to obtain money from illustrated papers and magazines for reproducing private portraits which are not the photographer's copyright, but which have been paid for by the sitter; but it is my intention in all cases to charge a fee (of not less than 10*s.* 6*d.*) for the use of copyright pictures, and in every case the name and address of the photographer should be printed legibly under each print.

JOSEPH J. ELLIOTT.

THE SCOTTISH ALPS.—LANTERN LECTURE BY MR. LAMOND HOWIE.

The Edinburgh Photographic Society's first popular meeting of the season, 1893–94, was held on Thursday, December 21. The arrangement has been continued of charging a sixpenny admission fee, and it has been fully justified, for the large hall was well filled, and the audience showed all the interest, and bestowed all the applause, that a lecturer could desire, even so deservedly popular and exacting a one as Mr. Lamond Howie, F.C.S. The chair was occupied by the President, Dr. Drinkwater, who, in introducing the lecturer, said that Mr. Howie needed little recommendation from him, they all knew the enjoyable evenings they had had with him, and this would doubtless be at least equal to those they had the pleasure of hearing and seeing in the same hall. The subject was "The Scottish Alps," the whole of the large series of fine transparencies being from the lecturer's own negatives, and were his own production. In the course of his introductory remarks, Mr. Howie stated that, in this age of travel, too many of those who expatiated on this and similar topics had been content to acquire their knowledge of the land of the "mountain and flood" from the guide-books or the top of the tourist coach. The higher mountains were, a short time ago, regarded with a real awe, a wholesome terror, by the general public, a terror which the early mountain climbers rather fostered with a half-savage pleasure. These delusions were now being dissipated, and a mountain cult has sprung into existence; what had been the cherished enjoyment of a few enthusiasts was now, like the game of "golf," the fashionable affectation of the up-to-date holiday rambler.

The lecturer, by aid of the pictures, led the audience among the great peaks of the Highland border. Beginning in the Isle of Arran, with its highest summit, Goatfell, and skirting the Western Grampians, he showed Bens Lomond, Ledi, Mohr, Lui, Lawers, and emphasising the fact that the finest time for visiting the mountain scenery of Scotland was in the spring and early summer. At this time, as is well known, the east side of our island is made comfortless with the easterly winds and sea fogs, which are quite unfelt and unknown on the western mountains and valley lands.

Among the higher ridges and corries were shown fine examples of snow drapery and frost feathers, and in the lower grounds examples of river, waterfall, and loch scenery, as also many of the glens and their inhabitants, from the hillside "Hielan smuggler" sampling his "sma still brew' of the mountain dew (but who looked a manufactured example of his tribe) to others showing types of the clachan dwellers, most of them well arranged or caught with the artistic eye for effect, and several of them highly humorous in detail.

The varied aspects of cloudland, nowhere so effective as in mountain regions, were shown by a number of pictures thereof of the highest order of excellence, showing the effects of nimbus, partial and local rains, the cumulus, morning mists, wind-scattering clouds, &c.

A following series were devoted to those depicting aspects of weathering on mountain scenery by rains, by frosts, the effects and results of ancient glaciation, erosion by torrents, and much that has helped, and is now acting in the sculpturing of mountain chains and mountain landscape. These were continued by pictures from the central and eastern Grampian range, among which were those showing the ascent of Ben Muich Dhui, the crossing of Brierach to the River Spey, thence to Deeside, and "the steep, frowning glories of dark Lach na Gar," followed by snow in summer, and King Frost's reign in winter, frozen waterfalls, gigantic icicles, overhanging snow cornices, several deer-stalking scenes, and then were introduced the closing group of views of an Easter ascent of Ben Nevis, with a number of views on the summit of it, with its inhabitant scientific workers, who, in all weathers and seasons, work steadily on the highest peak, observational point, inhabited spot in the British islands, which brought this most enjoyable evening's work to a close. There must have been a most rigorous examination and excision to have enabled Mr. Howie to bring so many technically and artistic perfect together pictures. A most cordial vote of thanks was awarded, amidst universal applause.

COLOUR PHOTOGRAPHY ON THE SCREEN.

As has been known for some time, says the *Scientific American* (New York), the primary colours of the spectrum, red, blue, and green, when combined, produce white light. The utilisation of these colours in reproducing photographs in the colours of nature has been proposed and demonstrated by Mr. Fred Ives, of Philadelphia. His method has been lately improved upon by an optician of this city, Mr. R. D. Gray, and it was our privilege to witness his public demonstration of his improvements on the 8th ult.

He follows out the usual method of taking pictures for colour reproduction, by first taking in the camera on an orthochromatic plate, with a red screen between the lens, a picture in which all the light values of the blue and white rays are excluded, allowing only the colour values of the reds in the subject photographed to be reproduced. In making such a photograph, which takes the longest time, he usually has the lens stopped down to *f*-8, and gives an exposure of three minutes. He then takes another negative, with the camera in the same position, in which nothing but the green of the object photographed has any effect on the plate. Still retaining the camera in the original position, the third negative is taken in the ordinary way with white light, or without any tinted screen behind the lens, which represents all the value of the blue and white rays that emanate from the object. After these negatives are once made, it is simply a matter of ordinary photography to reproduce from them lantern slides or positives.

It should be mentioned that the lantern consists of three objectives and three condensers, in front of one of which is placed a blue glass, in another a red glass, and in another a green glass. These three optical systems are illuminated by three separate jets of limelight, or, instead of limelight, the electric arc light may be used.

To project the three separate positive pictures in a lantern, he has a square light wood frame divided into four compartments or four apertures, and he uses three of these apertures for holding the plates, and his method of aligning the respective plates with the lantern is somewhat ingenious and practical.

One of the most difficult problems connected with this system of projecting the colour pictures upon the screen is to make them exactly coincide, and Mr. Ives had great trouble in doing this when he made a public exhibition, but Mr. Gray has perfected a very simple and ingenious device for bringing each picture into the proper alignment. He first takes one plate, and secures that in one division of the lantern-slide frame, and places it in the lantern; he then takes the second plate, and places that in the second division of the frame, and then applies his adjusting attachment. One person stands at the lantern, and one at the screen. The operator at the lantern then operates the adjusting screw until the position of the plate is such that the person at the screen decides that the two images coincide. The third plate is similarly adjusted in the lantern-slide frame by a duplicated adjusting device. The whole is then removed from the lantern, and each plate is sealed in position, so that, for that particular lantern, this lantern-slide frame is all ready for use, and will always register accurately upon the screen. The positions of the pictures in the lantern frame correspond to the coloured screens through which they were originally made.

As a result of this method, it is a very simple matter to place picture after picture in the lantern, and run them through the same as an ordinary lantern, and Mr. Gray claims that, while others have only shown a few slides made for colour projection, he has been able to produce a large number.

Having thus perfected the minute detail of adjusting the pictures and the apparatus for showing them, it was very easy and simple to project them on the screen, and the marvellous beauty and delicacy of the combined colours, in showing the various grades of colour in the pictures, was surprising and most pleasing, and gave one a more adequate idea of the beauty of the landscape than an ordinary monotone photograph. In pictures of autumn foliage the delicate reds and yellows would appear to great advantage; in photographs of distant mountains the azure blue of the sky, covered with scattered white clouds, appeared with most natural effect, contrasting finely with the snow-capped peak and the brown and green foliage below, and in portraiture the colour of the skin, the clothes, and accessories were most admirably reproduced. The red and green in a watermelon picture were capital.

In using the limelight, when colours are combined, before the insertion of the slides, the appearance of the screen is white, with a slight tinge of blue. It is supposed that, if the electric arc light is used in place of the limelight, a still better result may be obtained.

The success of Mr. Gray in demonstrating the practicability of projecting photographs in colours is certainly an advance in this line of work. We believe he has applied the same principle to the reproducing of coloured photographs in printing inks.

Our Editorial Table.

Wright's "Dexter" Mountant and Ruby Backing.

G. Wright & Co., Hopwood, Lancashire, have sent us sample bottles of the above. The former is a mountant for gelatine prints, the instructions given for its use being to apply it to the back of the print with either a stiff brush or the finger, taking care not to allow any to get on the face. The ruby backing, when applied to the back of the negative plate, prevents halation. Both of these preparations are quite effective for the purposes for which they are respectively

intended. "Una," from the same makers, is a preparation for toning gelatine prints. It is in the form of a white powder, and is added to the hyposulphite of soda in the proportion of thirty grains to four drachms of the latter for seven ounces of water. In ten minutes the prints assume a chocolate-brown tone, which, after washing and drying, become a rich purple colour. It is claimed that the prints are as permanent as if toned with gold.

WILLIAM TYLAR, Birmingham, has sent us a packet of consecutively numbered slips for pasting on negatives. They are printed on sheets, the backs of which are gummed, and, of course, must be cut off as they are used.

CRESCO-FYLMA.

To meet the difficulty of the curling of thin or rollable celluloid negatives, the Cresco-fylma Co. recommend the stripping of the gelatine pellicle from the celluloid film and its transference to glass. They send us some of their stripping fluid, which, as it answers so well for glass negatives, is also applicable for those on celluloid. The idea is a happy one, and we shall try it exhaustively when the weather permits of exposing a few films out of doors.

FITCH'S FILM-CARRIER.

THE simplicity of the film-carriers introduced by Mr. Fitch is equalled only by their efficiency. A stiff cardboard is coated on one side by a substance which remains tacky, and on this the film is placed *in situ*, where it remains flat and rigid. When about to be developed, the film is easily stripped from the supporting board, which is ready to receive another film without further preparation. *Apropos*, we cannot speak too highly of some of Mr. Fitch's films which accompanied the carriers.

"THE PRACTICAL PHOTOGRAPHER." VOL. IV.

"THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER." VOL. IV.

WE are indebted to the courtesy of their respective conductors for having received handsomely bound volumes of their journals, containing all their issues for 1893. Each has numerous illustrations.

PANORAMA OF MATSUSHIMA (JAPAN).

By K. OGAWA. From negatives by W. K. BURTON.

MATSUSHIMA is the name given to an archipelago of pine-clad islands in Northern Japan, and has the reputation of forming one of the three most beautiful scenes in that country. The picture consists of five photographs of 12 × 10 dimensions, joined together by a linen folding strip. They are all admirably trimmed so as to present a continuous whole when opened out, and much skill has been displayed in this respect, and also in the uniformity, which forms a characteristic of the whole. It was only to be expected that the negatives, being taken by a photographer so experienced as Professor W. K. Burton, should be all that could be desired, which proves to be the case. The point of view has been well selected to show the salient features of the scene. The panorama, which is delicately tinted with colours, reflects the highest credit on both the gentlemen concerned in its production.

HESEKIEL'S GRAIN PLATINUM PAPER.

MESSRS. ARTHUR SCHWARZ & Co. have sent specimen prints on this paper for which they are agents, together with a certificate of exhaustive experiments made by Dr. A. Miethe relative to its qualities. One of its properties is stated to be that the new paper is not as much dependent upon the superiority of the negatives as the ordinary platinum papers. Dr. Miethe considers it an important novelty.

KING'S SOLUTION.

THIS solution, manufactured for Marion & Co., is for removing silver stains from unvarnished gelatine negatives. We have already borne testimony to the great value of Mr. King's solution for effecting the purpose intended, and are glad to find that it is now placed on the market, so as to be accessible to all.

News and Notes.

PHOTOGRAPHIC CLUB.—January 17, *Rough Paper.*

LEEDS CAMERA CLUB.—January 18, Smoking Concert. Members and friends.

WEST LONDON PHOTOGRAPHIC SOCIETY.—January 16, *Stereography*, by Messrs. C. Whiting and Dovaston.

WOODFORD PHOTOGRAPHIC SOCIETY.—January 18, *Platinotype*, by Mr. Henry W. Bennett. Visitors invited.

ADDRESS WANTED.—Mr. Arthur Meeks, of Rundle-street, Adelaide, South Australia, would like to have the address of Mr. L. C. Meeves, late of Old Kent-road, and Junction-road, Holloway, N.

FORFARSHIRE PHOTOGRAPHIC EXHIBITION COMMITTEE. — Lantern-slide Competition.—We learn that the entries for this Exhibition are numerous, and from the best workers in all parts of the kingdom.

WE have received a revised card, being the *Relative Speed List* of plates, for use with the Watkins' exposure-meter, compiled from actual daylight camera tests (pyro developer) by Mr. Alfred Watkins. It embraces English, American, and Continental plates.

MESSRS. TAYLOR, TAYLOR, & HOBSON have been honoured by a request from South Kensington to lend for the Museum examples of their improvements in screws, and to illustrate their methods of attaining a high degree of accuracy in the ordinary practice of making and measuring lens-screw fitting.

THE Annual Entertainment and Ladies' Night of the London and Provincial Photographic Association will take place at the Champion Hotel, Aldersgate-street, on Thursday, March 8. The arrangements are in the hands of a Sub-committee, consisting of Messrs. Thomas Bedding, J. S. Teape, W. D. Welford, and T. E. Freshwater (Hon. Secretary).

CENTRAL PHOTOGRAPHIC CLUB.—To-night, Friday (January 12), Mr. F. P. Cembrano, jun., will deliver his lecture on *Granada and the Alhambra*, accompanied by lantern slides. Next Friday Mr. Kenneth Murray, Manager and Engineer of Brin's Oxygen Company, will deliver an address on *Compressed Gases and Cylinders*. All interested in lantern matters are cordially invited.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—Owing to Mr. Horsley Hinton's state of health, his paper, which was to have been read before the next meeting of the Society, has been deferred to the summer session. On January 15, Mr. John Howson will therefore demonstrate the working of the new Ilford matt-surface paper, and Mr. C. L. Burdick will give an exhibition of the use of his improved Air Brush.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.—The Seventh Annual Exhibition, under agreement between the Society of Amateur Photographers of New York, the Photographic Society of Philadelphia, and the Boston Camera Club, will be held at the Galleries of the American Fine Art Society, 215, West Fifty-seventh-street, near Broadway, New York, April 16 to 28, 1894. All correspondence should be addressed to Mr. Thomas J. Burton, 111–115, West Thirty-eighth-street, New York.

HACKNEY PHOTOGRAPHIC SOCIETY.—January 16, Lantern Evening, by Messrs. Birt Acres and J. B. B. Wellington. 23, Ladies' Night; Lantern Evening by Mrs. H. Snowden-Ward (Miss Catherine Weed Barnes). 30, Paper by Mr. Thomas Bedding. February 6, *To the World's Fair and Back*, by Mr. H. Snowden-Ward. 13, *Architectural Photography*, by Mr. J. H. Avery. 20, *Photo-micrography*, by Mr. Charles H. Oakden. 27, Lantern Evening, *Ireland*, by Mr. F. W. Hindley. March, 6, Members' Lantern Night. 13, Smoking Concert in Club-room. 20 and 27, Prize Slides.

BOROUGH POLYTECHNIC INSTITUTE.—The instructors in the Photographic Department are Messrs. Alfred W. Dollond, George Elliott, and Francis T. Beeson. A Class for Practical Instruction in Retouching Negatives will be commenced on Tuesday, January 23, 1894, at half past seven o'clock; fee for the course of twelve lessons, 10*s.* 6*d.* Practical Instruction in Printing from Negatives will be held on Saturday afternoons, commencing January 20, 1894, at two o'clock; fee for the course of six lessons, 5*s.* For further information concerning the Photographic Classes application should be made to Mr. C. T. Millis, Principal of the Educational Department.

DURING the months of February and March an Exhibition of oil and water-colour paintings, and decorative and applied art will be held at the Walker Art Gallery, Liverpool. A section will be devoted to photographic art and appliances, comprising original photographs from life, landscapes, and marine views, &c., for which no charge for space will be made, except in the case of professional photographers, whose contributions will be subject to the usual rate. A section will also be allocated for the purpose of illustrating the various processes and inventions in connexion with photography. Applications for wall space should be made to the curator, Mr. Charles Dyall, Walker Art Gallery, Liverpool.

CROYDON CAMERA CLUB.—January 15, Special Meeting to try the slides for display on 17th. 17, Public Lantern Show, Braithwaite Hall, *A Ramble Through Lakeland*, by Mr. John A. Hodges. Miscellaneous slides by members of the Club. Music by Birdhurst Glee Society, which will, during the interval, give the cantata "St. Cecilia's Day," by Jansen. 31, Beginners' Night. *The Development of Negatives* shown and explained by Messrs. Smith, Corden, and White. February 14, Public Lantern Display at Braithwaite Hall, *Within the Arctic Circle*, by Mr. A. Bellin. 21, Annual Meeting. Council Meeting on January 10 and 24, February 7 and 28. The above arrangements are subject to alterations.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.—January 11, Auction of Photographic Goods, the property of members. A few copies of presenta-

tion prints will be offered on this occasion. 18, *Wet-collodion Process for Lantern Slides and Photo-mechanical Negatives*, by Mr. W. T. Wilkinson, 25, Monthly Meeting. Mr. J. Howson, of the Britannia Works Company. Ilford. Subject, *Matt-surface P. O. P.*, at half-past seven. February 1, *Photo-zincography in Line and in Half-tone*, by Mr. W. T. Wilkinson. 8, *Toning, Finishing, and Mounting Gelatino-chloride Paper*, by Mr. F Anyon. 15, *The Carbon Process*, by Mr. W. T. Wilkinson. 22, Monthly Meeting. Lantern Lecture, *Old Flanders*, by Mr. E. M. Tunstall, at half-past seven. March 1, *Photogravure*, by Mr. W. T. Wilkinson. 8, Competition Slides. 15, *Collotype Process*, by Mr. W. T. Wilkinson. 29, Monthly Meeting, half-past seven. April 5, *Photo-micrography*, by Mr. W. T. Wilkinson.

THE Annual Children's Entertainment of the Photographic Club was held on Monday, January 8, 1894. The programme included:—Pianoforte solo, Waltz in F (Chopin), Miss Muriel Gaze. A selection of dissolving views, including some pictures of the Tower of London by Mr. T. E. Freshwater, and some flower studies by Mr. J. A. Williams. Solo pianoforte, "Ivanhoe March," Miss L. Tottem. Song, 'Love's old, sweet Song" (J. L. Molloy), Miss Lilly Gotz. A little nervous, but sung very nicely. Recitation, "Catching a Cat" (Margaret Vandequilt), Miss Emilie Bence. Duo pianoforte, "Dance of the Witches" (Theo. Bonheur), the Misses Muriel and Olive Gaze. Very nicely played indeed. Buffo scena, "Ye Historie of Blue Beard," with a life-size portrait, warranted a speaking likeness, by Mr. F. A. Bridge, as the gentleman in question, gorgeously arrayed in full Turkish costume, with lime-light effect, much to the delight of the little folks. Cakes, lemonade, ginger beer, biscuits, and coffee were abundantly supplied. Magic and Mystery, by Mr. Arthur Strode. Very good, as he usually is. Pianoforte solo, "The Chevalier Quadrilles" (Crook), Miss Muriel Gaze. Well played. A selection of dioramic effects and humorous slides, inciuding a children's humorous story and some very good dioramic effects and comic slides, kindly lent by Mr. A. Bridgman. As on last occasion, each visitor was presented with a bag of chocolates. About 160 present. All very much enjoyed themselves. Messrs. Newell, Zaehnsdorf, Tottem, H. M. Smith, and several other members, worked very hard to make the evening successful.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 158.—"Improvements in Lantern Microscopes." W. GREENWOOD and R. WALLWORK.—*Dated* January, 1894.

No. 366.—"Improvements in Photographic Cameras." Complete specification. W. FITZ-HARRY CURTIS.—*Dated* January, 1894.

PATENTS COMPLETED.

A PHOTOGRAPHIC HAND CAMERA.

No. 1000. HARRY GAMWELL, 37, Wavertree-road, Edge-hill, Liverpool, and CHARLES GAMWELL, 46, Low-hill, Liverpool.—*November* 25, 1893.

A PHOTOGRAPHIC hand camera provided with one or more light-tight sheaths so constructed that the camera and sheaths in combination with each other, the one, *i.e*, the sheaths, can be opened and shut by means of a double lever or other suitable mechanism, part of which is on the outside of the camera, the other part acting inside in conjunction with the sheaths, which can be opened and shut, during which process the whole of the inside of the camera is in darkness, thus enabling the manipulator to remove and replace the sheaths in the brightest sunlight.

The camera and sheath are constructed in the following manner:—The sheath is made of suitable metal and of such size as to enable a sensitive glass to be placed inside two flanges which form a groove, which stands just above the surface of the glass, into which the other half of the sheath engages with one flange, thus shutting out the light. The sheath is hinged at the bottom, and is provided with a lip on the top, which acts in a slot in the top of the double lever.

This double lever is constructed in the following manner:—At the bottom is a spindle with two sizes, or three shoulders. The larger size, or centre of the spindle, fits in a hole which is drilled through the camera, and is of the same length as the thickness of the camera side. On the inside shoulder is riveted a straight piece of metal with a slot at the top, and on the third shoulder which projects through the side of the camera is riveted or shouldered a suitable handle. At the top of this handle, which is made of such a thickness that it will spring a little, is a small projection, which, when it comes into position, drops slightly into a hole, which is drilled one at the top and the other at the bottom of a half circular shield of brass which is screwed on to the side of the camera.

IMPROVED SENSITISED PAPER FOR PHOTOGRAPHIC PURPOSES.

No. 20,042. ADOLF HESEKIEL, 32, Landsbergerstrasse, Berlin, Germany.—*November* 25, 1893.

THIS invention relates to the manufacture of granulated paper, and rendering same capable for photographic printing whereby artistic effects may be produced.

The improved paper for photographic purposes is prepared in the usual way, either by hand or machinery, but of sufficient substance to receive the impress from rollers or otherwise, of a granular surface; the granulations may represent ears of corn or other small matters, or may consist of indentations, corrugations, waved, curved, or other lines, the object being to break up the surface of the paper somewhat regularly or irregularly, so that when made light sensitive in the ordinary way and operated on, the printed matter or photograph may present the appearance of line or other engraving, or etching, or other effect.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—

The combination of a granular-surfaced or granulated paper with light sensitive agents for the purposes of obtaining photographs substantially as described, and for the purposes set forth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 15	Camera Club	Charing Cross-road, W.C.
,, 15	Glasgow & West of Scotland Am.	180, West Regent-street, Glasgow.
,, 15	Leeds Photo. Society	Mechanics' Institute, Leeds.
,, 15	Richmond	Greyhound Hotel, George-street.
,, 15	South London	Hanover Hall, Hanover-park, S.E.
,, 16	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 16	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 16	Derby (Annual)	Smith's Restaurant, Victoria-st.
,, 16	Exeter	City Chambers, Gandy-st., Exeter.
,, 16	Hackney	206, Mare-street, Hackney.
,, 16	Hastings and St. Leonards	
,, 16	Keighley and District	Mechanics' Institute, North-street.
,, 16	North London	Canonbury Tower, Islington, N.
,, 16	Paisley	9, Gauze-street, Paisley.
,, 16	Rochester	Mathematical School, Rochester.
,, 17	Brechin	14, St Mary-street, Brechin.
,, 17	Bury	Club Rooms, 13, Agar-street, Bury.
,, 17	Leytonstone	The Assembly Rooms, High-road.
,, 17	Manchester Camera Club	Victoria Hotel, Manchester.
,, 17	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 17	Southport	The Studio, 15, Cambridge-arcade.
,, 17	Southsea	3, King's-road, Southsea
,, 18	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 18	Camera Club	Charing Cross-road, W.C.
,, 18	Glossop Dale	Norfolk-square, Glossop.
,, 18	Greenock	Museum, Kelly-street, Greenock.
,, 18	Hull	71, Prospect-street, Hull.
,, 18	London and Provincial	Champion Hotel, 15, Aldersgate-st.
,, 18	Oldham	The Lyceum, Union-st., Oldham.
,, 18	Oxford Photo Society	Society's Rooms, 136, High-street.
,, 19	Cardiff	Castle Arcade, Cardiff.
,, 19	Central Photographic Club	Coleman's Hotel, Henrietta-st., W.C
,, 19	Croydon Microscopical	Public Hall, George-street, Croydon
,, 19	Holborn	100, High Holborn, London, W.C.
,, 19	Leamington	Pump Room, Leamington.
,, 19	Maidstone	"The Palace," Maidstone.
,, 19	North Kent	Gravesend.
,, 20	Hull	71 Prospect-street, Hull.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JANUARY 9,—Mr. J. Spiller (Vice-President) in the chair.

Scrutineers for the annual election were appointed.

EQUINE PHOTOGRAPHY.

Captain M. H. HAYES introduced this subject by paying a tribute to Mr. Frank Haes, as the pioneer of animal photography, to Messrs. Dixon & Son, Anschutz, and others. He approached the subject of photographing horses not from an artistic standpoint, but from that of portraiture. In photographing a horse one wanted to see him in the position that one would like him to be in if one were going to buy him. He thought the best position was broadside on. He advised a hand camera for the work. Without such a camera he would have been unable to get the results he had in the Transvaal and other places abroad. Great praise was therefore due to Mr. Haes and the other workers who had produced such good results with wet plates. He thought a focussing camera necessary, on account of the rapidity of movement of the horse, and a shutter working from half a second up to one eight-hundredth. He did not think there was at present in the market any shutter that would expose the entire plate in that short period of time. He preferred a twin camera (which Mr. Dixon was the first to use for this kind of work), light being excluded as much as possible from the focussing screen. For a quarter plate he used a lens of six and a half inches, working with a large aperture.

A number of lantern slides from negatives by Captain Hayes and others were then shown, the Captain pointing out their features in illustrating his views as to the best way to photograph the animals. Two pictures of a cheetah were presented, one representing the animal in a recumbent position, the other depicting him broadside on. The latter position, said Captain HAYES, gave one the better idea of what the animal was really like. "Coming to the 'osses," as the late Mr. Ducrow is said to have remarked, Captain Hayes showed several slides of horses photographed against the sky, with the distance dwarfed, which he recommended as the best way of taking horse portraits. The horse should be placed with strange surroundings, away from his stable, which conditions would excite him. A series illustrating the walk, the trot, the canter, the gallop, &c., next followed, among them being several of races at Kempton Park, and were followed by horses jumping, and zebras, the exhibition concluding with slides illustrating the evolution of the horse's leg from a polydigital extremity to its present form.

The CHAIRMAN, referred to his own experiences of photographing horses years ago for artillery purposes, when he used to find a very shrill whistle

useful for arresting the animal's attention at the moment of exposure. Suddenly opening an umbrella also answered.

Mr. FRANK HAES said it was thirty years since he started animal photography. He always learned something from Captain Hayes' lectures, and had never seen any photographs equal to his. He (Mr. Haes) had recognised that the only way to photograph animals correctly was in profile, and he used to take them stereoscopically, using long-focus lenses.

After other remarks by Mr. Debenham, Mr. Bolas, Mr. Addenbrooks, and Mr. Dallmeyer, a cordial vote of thanks was passed to Captain Hayes for his discourse.

Mr. Charles L. Burdick, of Chicago, having demonstrated the use of the Fountain Air Brush, the meeting terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 4,—Mr. Walter D. Welford in the chair.

The HON. SEC. (Mr. T. E. Freshwater) referred in sympathetic terms to the death of Mr. D. P. Coghill, a member of the Association.

HURTER & DRIFFIELD; OR, THE MEN AND THE MONEY BAGS.

Mr. E. HOWARD FARMER read a paper on this subject [see page 21]. A discussion followed.

Mr. P. EVERITT said he was glad to see that Mr. Farmer had recognised to the full the valuable work Messrs. Hurter & Driffield had done. That work was probably the most important that had been done in photography for a number of years. Since he had adopted their method of calculating exposures he had found a very considerable advance in the number of good results as compared with before. No doubt that was, to a large extent, due to the approximately accurate method of determining the speed of plates which they had formulated. Photographers used to take plates of a generally known speed and went on working with them, thinking there was regularity in them. But that had been found not to be the case. They now got plates numbered according to their sensitiveness, which was a great help. As to development, persons were apt to pooh-pooh Messrs. Hurter & Driffield's conclusions. People judged of a plate to be finished when it was taken out of the developer. That might or might not be the case. If we stopped development short of reducing the amount of silver it would produce, we could obtain modifications which were apparent contradictions of Messrs. Hurter & Driffield's position, although in reality they were not, for the plate would be only partially developed; it had not been carried to its fair conclusion, so that it would only be true so far as development had gone. As to the nature of development, and the film with which one is dealing, with a weak developer so much was absorbed straight away; if weak all round, only a certain amount could be reduced by it. Suppose a certain amount of ammonia were added, it would take some time to penetrate the film Adding it at once, without allowing it the full effect on the most exposed parts, persons would say that Messrs. Hurter & Driffield were wrong, because it had not penetrated the film. If it were allowed to penetrate the film the same as the original developer, it would be found that the gradation yielded would be the same.

Mr. R. CHILD-BAYLEY had used a Bunsen photometer with a beam twelve feet long, but could not measure with it accurately. He asked whether the instrument with which Messrs. Hurter & Driffield worked was as delicate as the larger one?

Mr. W. E. DEBENHAM observed that Mr. Farmer had stated that the contention that, by modifying development, different relative gradations could be obtained, was disproved, but Mr. Everitt's case would prove the contrary. Mr. Everitt said, if we went on developing until we got out as much as we could with a developer, we should find the relations the same. This was begging the question. If we have over-exposed a plate, and, by modifying development, we get the middle tones and dense tones as we wanted them before we have brought out the shadows, which would weaken them, then we have modified the range of gradation, and stopped short of what can be developed. Referring to Mr. W. K. Burton's experiments and the published results, he said that, if those negatives had been developed to the full, a printable result could not have been got from them.

Mr. J. S. TEAPE assumed that in the three plates shown Mr. Farmer had used the same developer, and yet he noticed with the shortest exposure there was a perceptible tone over the clear glass, while on the longest-exposed plate there was no perceptible tone at all on the clear glass. Referring to the actinograph, he said he had saved a great many plates with it. In any case where he was in doubt about the exposure that would be required, he was guided by the reading, and always gave a correct exposure.

The CHAIRMAN quite agreed with Mr. Debenham in his remarks. Mr. Farmer had laid stress on stopping development at the correct point, so that he (the Chairman) did not quite see how, by carrying on development, that proved that the stoppage did not alter the gradation. *Apropos* Burton's experiments, he pointed out that no process of printing would render the same amount of gradation that is in a negative.

Mr. FARMER, in reply, said that Messrs. Hurter & Driffield had determined the experimental error in their observations with the photometer. As to stopping development at an early stage being tantamount to altering gradations, he asked if there was any evidence that the gradations were altered in such a case?

After other remarks a vote of thanks was passed to Mr. Farmer for his paper.

PHOTOGRAPHIC CLUB.

JANUARY 3,—Mr. S. Herbert Fry in the chair.

It was announced that Werge's *Evolution of Photography* had been added to the Club library.

The HON. SECRETARY (Mr. F. A. Bridge) stated that the Photo-Autocopyist Company had offered to demonstrate their collographic process before the members of the Club, and it was decided to accept the Company's offer for the second Wednesday in February.

A vote of thanks was passed to Mr. Thomas Bedding for editing the Annual Report of the Club for 1893, Mr. Bridge stating that this was the first time the Report had been published so early.

RESIGNATION OF MR. BRIDGE.

Mr. BRIDGE then informed the meeting that he would shortly be obliged to relinquish the office of Hon. Secretary and Treasurer, which he had held for some years past. He thought that, after an official connexion with photographic societies extending over a period of something like seventeen years, he was entitled to a rest; but, besides that, business and other matters now made it difficult for him to devote the necessary time to the work. As regards his successor, the Committee had approached Mr. James A. Sinclair on the subject, and that gentleman had agreed to undertake the duties. Mr. Bridge, having stated that his retirement would take effect from the 31st of this month, bespoke for Mr. Sinclair the same consideration the members had always shown him.

The CHAIRMAN, on behalf of the members, expressed regret at Mr. Bridge's resignation, and said that the Club owed him a very great deal for all the work he had done on its behalf.

Mr. ALEXANDER COWAN endorsed the Chairman's remarks, and proposed that a very hearty vote of thanks be given to Mr. Bridge for his services. The vote was carried by acclamation.

Mr. H. Wilmer showed a patent paper clip, the "Tenax," made by Clemitson, 27, King-street, Cheapside.

PAGET MATT PRINTING-OUT PAPER.

The CHAIRMAN exhibited several gelatino-chloride prints (Paget matt and glossy surface), made by printing-out and development. The paper had been unpacked and placed in the frames in the light of an ordinary room, and the developed prints showed that there was very little need for extra precautions in shielding from the light. He also drew attention to the fact that the difference between the developed and printed-out prints was not practically distinguishable. The Chairman further showed prints illustrating the difference in results of prints from the same negative on matt and glossy paper, and remarked that it was easy to get sepia tones on matt paper by employing about a third of the quantity of the gold advised. For purple tones the bath should be used in a concentrated state.

Mr. G. W. Tottem presented a folio of silver prints, being copies of Turner's *River Scenery of England*, to the Club library. The book was about thirty years old. Mr. Tottem was heartily thanked for the gift.

Mr. BIRT ACRES read a paper on *Clouds*, and showed slides of the different forms of clouds. In acknowledging the vote of thank, Mr. Acres expressed a hope that more cloud work would be done by photographers in the future.

Brixton and Clapham Camera Club.—January 2, Annual General Meeting, Dr. J. Reynolds (President) in the chair.—One new member was elected. The Club then elected officers for 1894, the names being as follows:—*President:* Dr. J. Reynolds, F.R.G.S.—*Vice-Presidents:* Messrs. J. W. Coade, W. H. Harrison, G. P. Wyatt.—*Committee:* Messrs. T. J. Bartrop, J. A. Butler, E. Dockree, F. W. Kent, F. W. Levett, W. Thomas.—*Committee of Instruction:* Messrs. T. J. Bartrop, J. A. Butler, E. Dockree, F. W. Levett, W. Thomas.—*Delegates to Photographic Society of Great Britain:* Messrs. J. A. Butler, W. Thomas.—*Auditors:* Messrs. F. P. Knights, C. F. Palmer.—*Treasurer and Curator:* Mr. R. G. F. Kidson.—*Hon. Secretary:* Mr. B. E. Pinder, 7, McDowall-road, Camberwell, S.E. The Club approved of the report of the Committee for the past nine months. The report showed that the stock of apparatus has been increased by the addition of a 15×12 enlarging camera, a 10×8 Griffith's enlarging camera for quarter-plate negatives, a blackboard, easel, &c., and a typograph for the use of the Hon. Secretary. The membership was fifty-two, as against fourty-five in April last. The Treasurer's balance-sheet, which was embodied in the report, showed a slight balance in hand, instead of a deficit as at last Annual Meeting, notwithstanding that great additional expense has been incurred since that date. It was decided to establish a Club Library and a Sale and Exchange List. Several donations of books were promised, and it is hoped that photographers in the neighbourhood of Clapham, Brixton, &c. will visit the Club, which proposes very shortly to acquire a permanent room of its own. The fourth Annual Exhibition will be held during the week ending March 10 next, particulars of which may be obtained from the Hon. Secretary as above.

Central Photographic Club.—January 5.—Mr. C. L. Burdick, of Chicago, gave a practical demonstration of the working of his improved Air Brush. He said the great feature of it was its simplicity, containing fewer parts than any of its predecessors, and there was no friction on any of the parts, causing them to wear out and require replacement. Of a large number in use in the States, none had been returned for repairs except such as had been damaged accidentally. The greatest use of the tool was for working up in black and white, but any water colours could be used with it, in proof of which he exhibited a water-colour portrait which he had executed. In the States the Air Brush was used for the decoration of lamp shades and other articles of chinaware, which were afterwards fired. Experiments were being carried out with the view to its use in laying the ground for photogravure. Mr. Burdick executed a number of sketches in the room, including a life-size portrait of a gentleman in the room. The latter was executed in five minutes. In reply to an inquiry, the demonstrator thought the tool could be used for tinting lantern slides, and it was arranged to place some in his hands for experiment.

Croydon Camera Club.—In spite of a severe blizzard, there was a very fair attendance on Wednesday, the 3rd inst., when Mr. G. R. WHITE read a paper upon the *Evolution of Photographic Lenses*. The principles upon which the chief types are constructed were illustrated by a large number of specially prepared diagrams, and the limits of applicability of the various forms emphasised. The discussion was chiefly taken part in by Messrs. Pierce, Smith, Packham, Halland, Maclean, Cordew, and Frost, in the course of

which several minor points were elicited. Thus it is fallacious to suppose that it makes any difference whether the front or the back lens of a rapid symmetrical, or similar type of combination, is used when it is desired to employ a single lens for view-taking; but, in doing this, it is desirable to alter the position of the stop, this last point is often disregarded with unfavourable results. In reply to the President as to experience of metol, samples of which had been given out on a previous occasion, none had succeeded well with the maker's formula. Mr. HALLAND reported favourably of metol with hydroquinone, as recommended in the pages of this JOURNAL, good results with paper and slides being obtained. Mr. E. PIERCE, of South Norwood, using the same, stated that, compared with pyro, the results were uncertain; out of twelve negatives, he found that six would be worse and six better than the pyro negatives, all of which latter would be alike in quality; but the metol negatives which happened to be good were decidedly superior to the pyro ones. Mr. Pierce also showed a print on Hardcastle's platinum paper. It had been exposed for one hour in medium light, and no image at all became visible; on breathing on the paper, the picture developed out, and a soft print resulted, free from mealiness and as plucky as all but the strongest of ordinary platinotypes.

Croydon Microscopical and Natural History Club (Photographic Section).—January 5, Mr. C. H. Sparrow in the chair.—Mr. C. F. ROBINSON showed and demonstrated the uses and toning of Mezzotype paper, and, from the results produced and shown, placed it in the front rank as a paper for artistic work. The keeping qualities of the paper were such as to commend it for intermittent printing, and, after being kept for twelve months, was as good then as ever, and showed little or no deterioration in a subsequent print produced from it. The variations in tone obtainable ranged from red-brown and sepia to black and grey. Before toning, a sponging on the back and front, so as to thoroughly saturate the paper, was advantageous. Fixing should be done in a weak bath. Separate toning and fixing baths should be used. The following bath gave beautiful results, and subsequent fixing had little or no effect in reducing the colour obtained:—Chloride of palladium, 6 drops; distilled water, 10 ounces. A salt bath between toning and fixing was recommended.

Hackney Photographic Society.—December 2, Mr. R. Beckett in the chair.—The Hon. Secretary showed Butcher's Cloud Negatives for lantern slides, and Baker's New Rapid Mounter. This being made of glass, dirt can easily be detected, and so thorough cleanliness be assured. Mr. C. L. Burdick of Chicago, then exhibited his Fountain Air Brush. Explaining its construction, and comparing it with the old form of air brush, Mr. BURDICK claimed that his invention possesses many advantages: for instance, it is smaller, being about the size of an ordinary reservoir pen-holder; it contains only one-fifth the number of parts, and the pneumatic arrangement works more easily, and at lower speed. Thus it is more easily manipulated, is less likely to get out of order, and is steadier in action. Its uses are manifold. As a substitute for the pencil or brush in drawings, lithographic work, enamels, &c., it is most efficient, while, as regards photographic work alone, it is useful for making vignettes, backgrounds, &c., and for working up enlargements. Any liquid colour, either in water or oil, may be used with it. Mr. Burdick then gave a most interesting demonstration on its use in drawing and shading. Most striking was the ease and quickness, together with the fine quality of the result, with which all degrees of work—from thick to thin lines, and heavy to the most delicate shadows—could be produced. In ten minutes Mr. Burdick, with the Air Brush, drew in sepia water colour, on cartridge paper, a finely shaded head, that in the ordinary way with pencil and stump would have taken hours to do. In answer to inquiries, Mr. Burdick said that the probable cost of the instrument would be about 6*l*. Mr. JOHN HOWSON then brought before the meeting some very fine examples of work done on the new Ilford Matt. P.O.P., and gave instructions for working the new paper. Both this and the old (glossy) P.O.P. require identical treatment, so that they may be manipulated together. Briefly, the instructions were:—Print to same depth as for ordinary P.O.P.; wash; pass into alum bath, although the latter is only necessary as a precaution in hot weather; wash again; tone to depth required, as there is but little change in fixing bath, and drying restores the tone; wash well again and then fix thoroughly. As the emulsion is thinner, and there is no mineral substratum, final washing may be somewhat shorter than for glossy P.O.P., about one hour and a half in running water being sufficient. Formulæ same as for the ordinary paper. For *sepia* tones use double quantum of gold; for *warm browns*, a short time in normal bath; for *black* tones, longer immersion is necessary, but black tones can only be obtained on prints from vigorous negatives. In answer to questions, Mr. Howson said, anent the use of the combined toning and fixing bath, that he did not believe in it, and the separate baths were preferable. Platinum toning of gelatine chloride papers was undesirable, because platinum salts have a staining action on gelatine and so discolour the whites; it was also unnecessary, because black tones could be readily produced by gold toning. He was also opposed to the development of printing-out papers. Mr. Howson then gave a demonstration on toning the new paper, and obtained some fine results. Samples of the paper were distributed among the members for trial.

South London Photographic Society.—January 1, Mr. Mark Boxall in the chair.—Mr. F. J. LEWIS delivered his lantern lecture entitled, *Eastward Bound*. After a few Continental views, the lecturer gave a very graphic description of Hong Kong and its situation, accompanied by slides of his own preparation. Scenes in the streets were shown, and vivid accounts of the treatment of the native police by the Europeans, the gambling dens (now situated outside the city), the observances at funerals, and many other incidents, showing that Mr. Lewis was a keen observer of the customs of the "heathen Chinese." The difficulties of the amateur fire brigade were recounted. By some peculiar coincidence the fires always broke out about seven o'clock in the evening, when the members of the brigade, in common with other Europeans, were at dinner. The coolies always gathered near the scene of the outbreak, and endeavoured to prevent the brigade doing their duty. A view showing a number of Chinese pirates about to be executed was shown, followed by one taken after the decapitation. From the lecturer's description it was quite certain the Chinese had not secured his esteem after four years' residence among them. After a short description of Shanghai, Yokohama and the Japanese were dealt with. After leaving Japan a visit was paid to Honolulu. The native army of forty men, the band (bossed by a German), and the native dancing girls were all described in their turn. A few views of San Francisco and the seal rocks brought to a termination a lecture brimful of information.

Rotherham Photographic Society.—January 2, Mr. E. Isle Hubbard, M.S.A. (Vice-President), in the chair.—The result of the "Members' Competition, 1893," was announced as under:—Six untouched negatives and six prints therefrom resulting from Society's excursions: 1, Mr. H. C. Hemmingway, President's silver medal; 2, Mr. E. I. Hubbard, President's bronze medal. Six untouched negatives: 1, Mr. R. Chrimes; 2, Mr. J. Clarke. Six contact prints: 1, Mr. R. Chrimes. Six lantern slides: 1, Mr. G. T. M. Rackstraw. Mr. Chrimes is first of negatives in the class for members who have not previously taken a Society's prize, and Mr. J. W. Baker is first for prints in the same section, but, owing to there being less than three competitors, the awards are withheld. A similar remark applies to the classes for "artistic print" and "hand-camera work." The Judge, Mr. R. Keene, of Derby, was accorded a hearty vote of thanks for his services, and for his kindly notes on the exhibits. All the work was displayed, and underwent critical scrutiny by the members, as did also a series of architectural photographs.

Sheffield Photographic Society.—January 4, Mr. ERNEST BECK in the chair.—The President announced the result of the annual competition as follows:—Class I., first prize, Mr. C. W. CROWDER; second prize, Mr. W. M. TOPLIS. Class II., first prize, no award; second prize, Mr. W. M. Toplis. Class III., first prize, no award; second prize, Mr. C. W. CROWDER. Class IV., for lantern slides, Mr. T. G. HIBBERT both first and second prize. The purchasing of a new lantern was referred back to the Council. A print on a new matt-surface paper was put on the table, and was much admired; also a patent ether saturator, which requires only one tube to work, and, as the oxygen is passed through the saturator, there is not the slightest fear or danger of an explosion. A number of prize slides were passed through the lantern by Mr. Ernest Beck in an efficient manner, and were much admired.

FORTHCOMING EXHIBITIONS.

1894.	
January 12–22.....	*Bristol Triennial International Academy of Arts, Bristol. Hon. Secretary, F. Bligh Bond, 36, Corn-street, Bristol.
——	*Exeter Amateur Photographic Society. Hon. Secretary, John Sparshalt, Fairfield House, Alphington-road, Exeter.
,, 15–29.....	*Photographic Society of Ireland. Hon. Secretary, J. A. C. Ruthven, 35, Dawson-street, Dublin.
February 6	Durham Camera Club. Hon. Secretary, R. Hauxwell, The Avenue, Durham.
,, 8–10	Woolwich Photographic Society. Hon. Secretary, W. Dawes, 145, Chestnut-road, Plumstead, S.E.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

* Signifies that there are open classes.

Correspondence.

THE SPEED OF PLATES: A CRITICISM AND A REPLY.

To the EDITOR.

SIR,—Mr. Elder's letter in your issue of December 29 has thrown some light upon the object he had in view in attacking our work, as he recently has done. We confess that till now we were inclined to regard him as a clever mathematician, who, in order to support Captain Abney, was not too careful in the application of his mathematical knowledge, so long as, by means of it, he could strike what he thought would be a crushing blow to us. We have now, however, come to the conclusion that Mr. Elder was, after all, simply seeking for the truth, and that he honestly believes us to be wrong. We owe him, therefore, our apologies for having mistaken his motives; but, in order to take this more charitable view of his criticism, we are compelled to discredit him as a mathematician, for it is quite clear from his last letter that he is still in blissful ignorance of the mathematical blunder he has perpetrated, upon which the main portion of his arguments in favour of Captain Abney and against ourselves are based.

Mr. Elder's criticism, in a nutshell, is as follows:—He supports Captain Abney's method of speed determination because he thinks, though he offers no proof, that the range of transparencies utilised therein is greater, and practically more useful than is ours; and because this range of transparencies really satisfies our criterion of a theoretically perfect negative; and he condemns our method of speed determination because he thinks, though he offers no proof, that the range of densities we employ is too contracted, and practically useless to the photographer, and because our equation fails to satisfy our criterion of a theoretically perfect negative.

These conclusions must all fall to the ground, partly because they are the result of a mathematical blunder, which we now think it desirable to

point out, and partly because proof to the contrary has been already published by us, and can be easily verified by others.

We defined a theoretically perfect negative as one in which the transparencies are inversely proportional to the exposure. This definition, in the form of an equation, is as follows :—

$$T = \frac{a}{I}$$

T is the transparency, I the corresponding exposure (product of intensity of light and time of action), and a is some constant.

Mr. Elder defines the differential of the transparency with respect to the exposure as the "printing value," and, from the above equation, it follows that, for a theoretically perfect negative, the "printing value," taken negatively, must be inversely proportional to the square of the exposure, and not, as Mr. Elder has it, to the exposure.

(1) $$\frac{dT}{dI} = -\frac{a}{I^2}$$

We also gave a second definition of a theoretically perfect negative, namely, that its densities are proportional to the logarithm of the exposure; and we carefully defined density as the negative logarithm of the transparency. This definition expressed algebraically, introducing another constant μ (our development factor), and i (our inertia), is—

$$-\log T = \mu\left(\log \frac{I}{i}\right)$$

and the corresponding differential equation becomes—

(2) $$\frac{dT}{dI} = -\frac{a}{I(1\times\mu)}$$

in which a is a constant. When the factor μ becomes numerically equal to 1, then, and only then, is the negative theoretically perfect, as we pointed out on page 15 of our *Photo-chemical Investigations*. In this case, the above equation (2) becomes identical with (1).

It was in translating our definition into a differential equation that Mr. Elder committed his blunder, for he states that, when this differential equation is of the form

$$\frac{dT}{dI} = -\frac{B}{I}$$

(as it really is for Abney's straight line), the negative satisfies our definition of a theoretically perfect negative.

We trust Mr. Elder will now see that it is our equation alone which can ever satisfy our criterion of a perfect negative, and that no portion of the 'law of error' curve, nor the tangent to its point of inflexion, ever will satisfy it.

As to the more extensive range of gradations employed by Captain Abney, he himself says, 'therefore in practice a transparency of about 0·606 and two others give three points (two are enough),' &c.

With respect to the relative practical value of the range of transparencies utilised in the two methods respectively, we refer Mr. Elder to measurements of negatives published in our paper, read at the last meeting of the Photographic Convention.

Mr. Elder's blunder is of about the same order as Captain Abney's proof that a parabola does not differ much from a straight line, and we trust that, now we have called his attention to it, he will, in scientific honesty, admit it, and so make some reparation for the injury which, we are only anxious to be assured, he has unintentionally done us.—We are, yours, &c., F. Hurter & V. C. Driffield.

Widnes, January 9, 1894.

To the Editor.

Sir,—We understand it has been rumoured that we were about to give up the Hurter & Driffield system for determining the speed of dry plates. As this is entirely contrary to the fact, we shall be much obliged by your giving us the opportunity of saying that, after more than twenty thousand tests, we are more than ever convinced of the correctness and value of their method.—We are, yours, &c., Marion & Co.

22 *and* 23, *Soho-square, London, W., January* 10, 1894.

ACTION OF METOL ON THE SKIN.

To the Editor.

Sir,—In your last week's issue under the above title Messrs. Fuerst Brothers, "in order to safeguard the interests of their manufacturer," write to contradict the reports which have from time to time appeared as to the noxious qualities of metol. Perhaps you will permit me, in order to safeguard the interests of the public, to say something on the other side.

Messrs. Fuerst state that metol will not attack the skin if the hands are washed *during and after use*. What do they mean by "during use?" Do they mean anything, or is it only a discreet proviso inserted to guard their retreat in case of necessity? I invariably wash my hands after development, but this has not obviated the distressing effects experienced from using metol; and, although Messrs. Fuerst desire to contradict the reports, they are apparently conscious of weakness in their position, for they proceed to instruct those who have delicate skins to anoint their hands with vaseline before developing. Alas! I did this months ago without any appreciable effect, and I venture to suggest that I have not an exceptionally delicate skin, although not blessed with the hide of a rhinocerus.

Messrs. Fuerst mention that very few cases have been reported during the comparatively few months that metol has been on the market. Surely this is not strange. Do they expect all the afflicted to rush into print, or even at first to correctly diagnose the cause of their complaint? They state that their manufacturer has had no case on the Continent brought to his notice. Apparently he has not seen all the German photographic papers.

I think I may be allowed to have a fair knowledge of all the usual commercial developers, and, moreover, am brought into daily contact with a large number of photographers. I have never yet suffered from or met a case of poisoning with any other developer, while cases of metol poisoning are frequently reported to me.

That metol does have such an effect I regret exceedingly, for it is certainly one of the best developers for all-round work I have ever met; but having by its means lost the feeling in two of my fingers for some days, and seen the skin of the hands of others in a condition resembling parchment, I think it is only just that something should be said in opposition to the dogmatic assertions of Messrs. Fuerst, and so show the necessity of taking every precaution to render an otherwise admirable product perfectly innocuous.—I am, yours, &c.,

James A. Sinclair.

26, *Charing Cross-road W.C., January* 8, 1894.

THE BRONDESBURY CAMERA CLUB.

To the Editor.

Sir,—As one who would contribute his mite towards the continuance of the high tone which photographic journalism has hitherto maintained, might I be allowed to make a respectful protest against the amount of capital which has been made of the "Brondesbury Camera Club" incident.

In photographic circles in London one now hears nothing but "hydroxyl-monohydride," "Dr. Burton Coxe," "the excusable ignorance of the staff of a photographic paper," &c., to the complete exclusion of serious discussion; and one is irresistibly driven to the conclusion that the cleverness displayed was worthy of a nobler cause.—I am, yours, &c.,

January 6, 1894. Crosbie Combes.

[We lament our correspondent's evident lack of the sense of humour. All photographers, we should have thought, would have been grateful to a photographic journalist who, failing the ability to be instructive to his readers, accepted, if unconsciously, the opportunity of affording them some amusement. Our correspondent deserves to be fined "five pounds" for his obtuseness.—Ed.]

PHOTOGRAPHIC EFFECT OF WASTE LIGHT.

To the Editor.

Sir,—The paragraph in Friday's Journal on the above reminds me of two micrographic negatives which I have recently taken, prints from which I inclose. The effect of the outer cone of rays not brought to focus is marked in both, but especially in the Polyastis. These negatives were made with the eyepiece, which I seldom use. I have never noticed this effect with the objective only.—I am yours &c.,

Clifford E. F. Nash.

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To the Editor.

Sir,—There are one or two errors in "Free Lance's" letter to you of last week which make the reading puzzling. The word "other" in line 3, p. 16, should be omitted, and the word "vendor" in line 9 of the same page should be "vendee."—I am, yours, &c., Photo-Lex.

January 8, 1894.

THE NEW YORK EXHIBITION.

To the Editor.

Sir,—It will probably interest the exhibiting portion of your readers to know that the Seventh Annual Exhibition of the Joint Photographic Societies of New York, Boston, and Philadelphia will be held in New

York from April 16 to April 28 next. This Exhibition, under the auspices of the three above-named Societies, is the most important one on the other side of the Atlantic, and, in fact, the only one that will in any degree bear comparison with the principal exhibitions of Europe.

It is open to all the photographers of the world, professional as well as amateur, and it is to be hoped that our English practitioners of the black art will this year do their very best to maintain the position they have already won on the other side.

Last year's Exhibition, held in Philadelphia, was somewhat of a revelation to our American cousins. The English exhibit, taken as a whole, simply swept everything before it, though several of our leading men did not enter into competition for the prizes. Out of twenty-six medals, thirteen fell to England, one to Germany, and only twelve to America. But Brother Jonathan is not asleep. He had somewhat of a stagger last year, but comes up again smiling, and will conquer this time, or do his level best. The contest, then, will be severe, and any medals won will be worth having.

I will not say more, except that English exhibits need not be framed or mounted. They may be put into a roller and sent by book-post, addressed to Thomas J. Burton, 115, West Thirty-eighth-street, New York, and should arrive there on or before March 15. The Committee will mount and suitably frame all foreign exhibits, and return same when the Show is over. A handsome illustrated catalogue will be issued, and a copy sent to each exhibitor.

Full particulars must be mailed under separete cover, addressed as above, stating number and titles of prints sent, process, and whether negatives and prints are the exhibitor's own work.

I shall be happy to give intending contributors any further information they may require.—I am, yours, &c., H. B. HARRIS,

English Agent for the Society of Amateur Photographers of New York.

10, *Colville-gardens, W., January* 5, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, four-and-a-half or five-inch compound condenser. Exchange excellent half-plate rapid rectilinear.—Address, ROBERT MCCONCHIE, Kirkcudbright.

Will exchange a good burnisher, by Rock, eight and three-quarter inch bar, in first-class condition, for hand camera.—Address, D. P. PRIMROSE, Fawcett-street, Sheffield.

Complete collotype plant, value 15*l*., offered in exchange for quarter-plate outdoor outfit, or lantern outfit.—Address, A. WILKINSON, 7, Little Alport, Deansgate, Manchester.

Will exchange magic lantern three and a quarter inch condenser, and seventeen slides of agricultural machinery, by Newton, for quarter-plate camera.—Address, S. E. KELF, 189, Southampton-street, Reading.

Answers to Correspondents.

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

RECEIVED.—"Either Three Guineas," Focus. Thanks.

T. H. NASH.—We have no such process.

F. J. FRIDAY.—*Photographic Chemistry* by Hardwich & Taylor (J. & A. Churchill).

COL. CHLOR.—Use a pyroxyline of a less horny character for making the collodion, and add a little glycerine to it before adding the chlorides, &c.

S. BENWELL.—If you send a sketch of the proposed studio, and indicate on it the aspect, we shall then be able to advise. The present letter is quite unintelligible so far as concerns a description of the structure.

1, 2, 3.—Of course, unused plates contain silver; but we are not at all astonished that the refiner has returned them, saying that he cannot undertake to recover the metal. If the film only be sent, then he will deal with it.

D. LORD.—1. A rectilinear lens of about ten inches focus would be advisable. 2. Messrs. Edwards & Co., E. H. Fitch, and Thomas & Co. supply cut celluloid films. 3. Communicate with Messrs. Newman & Guardia, Shaftesbury-avenue, W.

WALTER WYKESMITH.—The case, we should think, is one for the County Court. Return the camera, sue for the money, and call expert evidence as to the worthlessness of the article. A threat to this effect will, no doubt, bring the firm to their senses.

F. BARKER.—If a sharp image, same size, of the cabinet picture cannot be obtained in the half-plate camera, it shows that the camera is not long enough. Try with the whole-plate camera, using the half-plate lens. That will, no doubt, get over the difficulty.

T. C. H.—There is no patent for stripping films from glass by hydrofluoric acid. This method was introduced some years ago by Plener, but he did not take out a patent for it. Most films, when stripped from the plate, expand, if no means be taken to prevent it.

PLATES.—The exposure by moonlight will, of course, depend upon the sensitiveness of the plates, the aperture of the lens, and the brightness of the light at the time. Better make a preliminary trial. No advantage will be gained by having the gas burning within the church.

H. AINSLEY.—We have not tried tinting "bromides" with aniline dyes, but have little doubt that the colours would "take." Why not try them for yourself, it would take you no longer than it would us? Bear in mind, however, many colours of the coal-tar series are of a very fugitive nature.

CAMBS.—Your Club are quite under a misapprehension in supposing that silver prints, on albumen paper, never last over five or six years. There are many in existence thirty years old and upwards, that show no signs whatever of change. We have many such. We fear your albums are of modern date, or they would prove the supposition to be unfounded.

T. SKEGGS.—The trouble appears to be due to the coldness of the solution. If the negative sent is a fair sample of the lot, we have little doubt on the point. Although so thin and phantom-like, in spite of the long development, it is full of detail. If there are any more plates to develop, warm up the solution to 60° or 65° Fahr., and keep it at that temperature while the plates are in it.

A. FRASER.—If you require to make a solution of indiarubber in benzole, you will not succeed with old vulcanised gas tube, even if it had not become so hard. Procure some "masticated rubber;" that is the best kind to use. When we require some thin solution, we usually purchase a tin of "solution" as sold at the rubber shops, and thin that down. It sometimes saves a little trouble, being more quickly prepared.

S. P. A.—Your neighbour, the chemist, is quite right. You are acting illegally in selling bichloride of mercury and cyanide of potassium, although you may be a dealer in photographic materials. If he were to set the law in force, you would find yourself mulct in unpleasant penalties. Rather take the intimation in a friendly light than as trade jealousy, and discontinue the sale of such things as are scheduled in the Poisons Act.

CONSTANT READER.—The conclusion arrived at is that the spots on the prints are due to some deleterious matter in the water. Try the effect of treating one with distilled water throughout, or with boiled water that has not passed through iron or rubber pipes. You wash too long by far. Read what Messrs. Haddon & Grundy have written on the removal of hyposulphite, and, by the way, also try the effect of changing your fixing salt for a different brand.

AMATEUR (N.W.).—We are not at all surprised that some first-class photographers have refused to take portraits of your friends and hand the negatives for you to supply them with prints from, because you could produce them at a cheaper rate. We should be very much surprised if they did such a thing. The only thing we can suggest is that you take the negatives yourself, and that we expect is what you will have to do if you wish to supply the prints.

W. A. W. writes as follows: "I see all manner of things recommended in the journals for mounting photographs with, but nobody seems to have thought of what is really the best of all, namely, dextrine. It is cheap, easily mixed, and keeps well afterwards, and last, though not least, it is simple in use."—Our correspondent is mistaken in saying that no one has thought of dextrine as a mountant before. Its use has frequently been suggested for the purpose, and is now a commercial preparation made up in solution.

MESSRS. WILLIS & CO. (Limited), of 92, Long-acre, London, W.C., write: "Will you kindly mention that this old-established business, at above address for sixty years, has been removed to more commodious premises at 92, Long-acre, the site of the late old Queen's Theatre, where we shall carry on the businesses of manufacturing message cards, paste and mounting boards, photographic mounts, enamel papers, show-card mounters, label-varnishers, gold-blocking, metal-rimming, and every other branch of manufacture appertaining to cards and paper?"

S. NICHOLL.—We are not aware that there is any trade secret in mounting prints without the mounts cockling, unless, indeed, it be the experience gained by practice. There is no better medium for the purpose than a solution of gelatine in which a large proportion of the water necessary to make a thin solution is replaced by alcohol, and prepared according to the formula referred to in the ALMANAC. No advantage is to be gained by the addition of more glycerine. In many instances the album is taken to pieces and the prints when mounted on the leaves and rolled. The album is afterwards rebound. The prints then lie perfectly flat.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1759. Vol. XLI.—JANUARY 19, 1894.

ETCHING GROUNDS FOR INTAGLIO PLATES.

One of the important points, and one not uncommonly overlooked, in connexion with the production of intaglio plates by the etching method, is the "ground" which determines the grain in the finished plate. In what has been published on this part of the subject, sufficient stress has not been laid on the importance of the ground and the part it plays in the process. The system pursued in obtaining the ground usually is to place some pulverised asphaltum in a "dust box," agitate it, and allow the particles to settle down upon the plate, which is placed near the bottom of the box. The plate is then heated, to melt and fix the asphaltum.

A little consideration will show that, if the plate be placed in position directly the dust is raised, and removed soon afterwards, the particles upon it will be coarser than if it had not been placed in position until the larger particles had subsided and only the finest ones then in suspension were allowed to settle upon it, and then only in an attenuated layer. Again, the amount of dust that is allowed to settle on the plate is important. A thick layer, whether coarse or fine, will manifestly produce a different character of grain from that obtained with a thin one. Furthermore, the degree of heat applied to melt the asphaltum also influences the grain. With either a thick or a thin layer, if too much heat be applied, or it be continued for too long a time, the asphaltum would be distributed homogeneously as a varnish without any grain at all. Hence, the copper would be quite protected from the action of the etching fluid.

Asphaltum, as just mentioned, is the material almost invariably recommended in text books for producing a grain, but there are many others that may be employed, and, for some purposes, perhaps more advantageously. Almost any resin that can be reduced to a fine powder, and be melted by heat, will answer. Common resin, for example, answers well, and it melts at a lower temperature than asphaltum. Fox Talbot, who may be termed the inventor of this system of photogravure, used copal, and it answers admirably, so does mastic. All these substances yield a grain which, although of the same general character, has its individuality, which, for some subjects, may be specially useful. A mixture of common resin and asphaltum has been advised. As these two materials have a different melting point, it will be seen that, if only sufficient heat were applied to melt the resin, the asphaltum would retain its particles unaltered, though they will be fixed to the metal by the resin. This also gives a further modified grain.

Photo-etching is just analogous to the now almost, if not quite, obsolete aquatint engraving, so far as the etching ground is concerned, and each aquatinter had his own pet method of forming it, which he frequently kept to himself as a profound secret. One of the methods of producing the ground was by dusting, as referred to above, but more frequently it was obtained with a solution of a resin in alcohol, flowed over the plate. By this means an exceedingly fine and even grain is obtained, and by altering the proportion of the resin to the solvent, and the kind of resin employed, it is capable of a wide range of modification. The grain obtained by this system is quite different from the dust grain, and partakes more of the character of reticulation.

If a glass plate coated with matt varnish be examined with a magnifier, it will be seen that the film is a mass of minute cracks, and this is precisely what is the case with this form of aquatint ground. The resinous solution, when applied to the metal plate, "chills" as the solvent evaporates, and the minute cracks expose the bare metal, which is attacked by the mordant. By varying the proportion of resin to spirit the grain can be made coarser or finer at will. The particular resin used also gives different characteristics. Some aquatint engravers employed a solution of mastic, some sandarac, and others, shellac resin, &c.; and, more generally than not, a complicated mixture of several resins, sometimes with certain advantages. A favourite ground with one aquatint engraver we know was a mixture of common black resin and Burgundy pitch in alcohol, and we have employed this identical ground in photo-etching with very satisfactory results. It need scarcely be mentioned that in laying this form of etching ground the solution must be applied to the plate cold, as, if the latter were heated, the varnish would not properly chill and crack. Hence the film, when dry, would be homogeneous, and completely protect the metal, as would a dust ground that was too thickly laid or over-heated. It may be mentioned that, in applying and drying the solution, the plate should be protected from draught, as that would cause an unequal evaporation of the spirit, and, consequently, an inequality in the grain.

As the grain obtainable by this system of working can be made exceedingly fine, it would appear to be better, perhaps, adapted for extremely delicate subjects than those requiring exceptional vigour. For such the dust grain would possibly be best. It is a little surprising that in connexion with half-tone, intaglio etching, only the dust method of obtaining grain is mentioned, and the other not alluded to.

UNSTABLE NEGATIVES.

When, in our issue of June 23 last year, we gave a plan by which the complete elimination of hypo and its compounds from a negative film might be practically ensured, we did so in the expectation that it would be applied as given. In endeavouring, however, to improve upon it, our old friend, Mr. W. B. Bolton, has not only succeeded in obtaining an opposite result to that desired, but has also apparently discovered a new cause of fading of the negative image.

From the description given in another column, the facts of the case or cases of fading will be gleaned, so that we need not here recapitulate them. We may, however, remark in passing, that there does not seem to be any evidence that the use of metol as the developer plays any part in the result, although it is very curious that the effect should be so erratic in its occurrence.

What we have more especially to consider in the present article is the nature of the chemical changes that occur, in doing which we shall have to rely more upon surmise than established fact; but, before embarking on that task, we would point out the difference between the treatment of negatives suggested by us and that adopted by Mr. Bolton.

The soluble contents of a gelatine negative film after fixing consist of the double hyposulphite of silver and sodium, together with bromide of sodium and excess of hypo, and, if there be plenty of the last-named salt present, the complete removal of the whole of these is only a matter of time and simple washing. If, however, there should be a deficiency of hypo, either from the use of a too weak bath or too short an immersion, a portion of the silver will remain behind in an insoluble form in combination with hypo, and it was in order to ascertain whether any trace of such insoluble salt remained that we proposed the treatment with iodide of potassium. Of the three silver haloids employed in photography the iodide is far the least soluble in sodium hyposulphite, and, in fact, the addition of a soluble iodide will, in a great measure, throw down the metal from a solution of bromide or chloride of silver in hypo unless the quantity present be extremely small. Thus it happens that, if a plate freshly taken from the fixing bath be treated with a soluble iodide—iodide of potassium, for instance—the soluble double salt of silver and sodium is decomposed, a large portion being converted into iodide of silver, which the free hypo present is unable to keep in solution. Consequently it is thrown down in the film, which reassumes the appearance of an unfixed plate.

The effect may be more clearly shown by means of solutions of the silver haloids in sodium hyposulphite. If a solution of the latter salt of ordinary fixing strength be saturated with chloride of silver, or, at least, allowed to take up a considerable quantity, and then filtered, a slightly coloured, but perfectly clear, solution will be the result. If, now, a solution of bromide of potassium be added, a copious precipitate of silver bromide will be formed, owing to the lower degree of solubility of that haloid as compared with chloride. If this be allowed to settle, or be removed by filtration, a fresh addition of a soluble iodide will cause a still further precipitate of silver in the form of iodide, a comparatively small portion still remaining in solution.

The *rationale* of the process described by us consists, then, in throwing down, in a visible form, the greater part of any silver present in the negative film, and, as the precipitated iodide requires to be removed by fixing, the probabilities are that the reimmersion in the fixing bath will ensure the complete removal of even the last traces not revealed by the iodide. But, in doing this, no decomposition of the hypo occurs, the only effect being to dissociate it from a portion of the silver it holds in combination, or to convert the double hyposulphite of sodium and silver, in which form the precious metal is present in the recently fixed negative, into sodium hyposulphite and iodide of silver.

But, in the case of the decomposed iodide of ammonium solution described by Mr. Bolton, an altogether different result is most probably formed. It is not possible to say what may have been the precise composition of the solution as used, but it may safely be assumed that it contained some free iodine; at any rate, we may take the action of the free iodine as illustrating the difference in behaviour. By such an addition the hyposulphites are decomposed with formation amongst other compounds of tetrathionates which are sulphur compounds of certainly not much, if any better, character than hypo itself, so that it is easy to see how the substitution of a solution containing free iodine may have a very deleterious instead of a beneficial action upon the negative film, even in the absence of any of the by-products of fixing.

But, under such circumstances, we should anticipate a tolerably rapid, if not indeed an immediately visible, change; that is to say, that the action of the iodine would render itself evident in the course of a few days, or perhaps even hours, instead of lying *perdu* some months; moreover, the nature of the change would, we surmise, partake more of the character of sulphuration than seems to be the case from an examination of the negative, which presents the appearance of being gradually eaten away, in much the same manner as would be the case if it had been treated with the old-fashioned clearing solution of cyanide and iodine, or one of the more recently used "eliminators" composed of an alkaline hypochlorite.

This brings us to another possibility in connexion with the solution of iodide of ammonium, to which allusion has been made, namely, that one of its possible constituents may be a substance of somewhat analogous character to the hypochlorites or hypochlorous acid. Hypoiodous acid and its salts, the hypoiodites, are formed by a variety of decompositions of iodine and its compounds, and are not unlikely to be present in the brown solution referred to. The effect of such an agent on the silver image, if allowed to remain in contact with it, can be easily imagined. Still, here again, if the agent were powerful enough to act at all, it would be imagined that it would do so at once and while the negative was in the wet state, and when therefore it had its fullest power of action, and not when rendered practically inert by drying. The fact of the tardy occurrence of the fading points, therefore, to the formation of some insoluble compound incapable of removal by washing at the time of treatment, but which afterwards slowly decomposes,

That the action of iodine differs entirely from that of an alkaline iodide is shown by the behaviour of negatives under their respective applications. Plain iodide of potassium, when applied to an imperfectly washed film containing silver, at once renders it opalescent to a greater or less degree according to the quantity of metal present. Not so, however, iodine, for the negative will often remain perfectly clear until the opalescence is apparently produced by the subsequent washing, and we have an instance in which it did not occur until the plate was dried.

We have alluded to this matter principally in order to show the danger of departing from the safe course laid down by us some months ago. But incidentally it may be considered as

only one more instance of the danger attending "eliminators" of hypo, especially such as decompose that salt, which iodide of potassium does not. Moreover, in using the latter, it is the necessity for refixing and washing that is really instrumental in securing the final result.

THE WET-COLLODION PROCESS.

VI.—Collodion Positives.

Unlike other processes, the image on a collodionised surface is, when viewed by reflected light, of a light colour. Hence, in the very earliest days of the process, the possibility of making positives in contradistinction to negatives was recognised. A picture of this class is negative when looked through, positive when looked upon. It is true that, as a negative, the image is thin and feeble, owing to the development being checked at an early stage; still, the image partakes of the negative character.

A very excellent way by which to illustrate the positive and negative distinction is to clip out a piece of tinfoil in any fancied shape—a star, for example—and paste it down upon the centre of a clean plate of glass. This affords an efficient demonstration of negative and positive, being the former when looked through, and the latter when looked upon. Attention having been paid to the conditions requisite to obtain positives of fine gradation and good colour, and which competed in these respects with the Daguerreotype, this latter, in an incredibly brief period, gave way before its potent rival, and ceased to be practised.

When the most ordinary precautions are taken to ensure permanence, a collodion positive never fades. We possess many that were taken within one or two years after the introduction of collodion, and they show no indication of fading, although more than forty years have elapsed since they were taken. What we mean by "ordinary precautions" will be explained as we proceed.

A collodion that gives a strong dense negative is not the best for positives. Here we want delicate thin gradation rather than vigour, the requirement being such thinness of the image as, except in the very highest lights, shall be influenced by any suitable black matter being placed behind or in contact with the plate. Such a collodion as that for which we gave a formula will answer well, provided it be considerably thinned by the addition of sulphuric ether. An immersion in the nitrate bath of two minutes usually suffices for sensitising, and with a thinly salted collodion the bath need not exceed thirty grains to the ounce at the commencement, although, singularly enough, it will frequently work well when the silver has been so far exhausted as to show only eighteen grains, although by making a bath of an initial strength of eighteen grains we have failed in obtaining good results. How far the presence of the products of decomposition tends to this end, or the probable manner in which they act, are questions not necessary to be here discussed.

Iron gives a whiter image than pyrogallol, therefore it must be the developer for positives. While it is quite true that pyrogallol, one grain to the ounce, with two drachms of acetic acid and one drop of nitric acid, has been recommended, it is less advantageous than iron in nearly every respect. While a developer giving moderately good pictures may be formed of a solution of protosulphate alone, yet will the addition of about two drops of nitric acid per ounce considerably improve the colour. Still better is the nitrate of iron. First suggested by Diamond, it was prepared, according to Ackland's treatise on the positive collodion process, by decomposing the proto sulphate of iron with nitrate of barytes, and removing the sulphate of barytes which is precipitated. The formula stands thus:—

Protosulphate of iron	2 drachms.
Nitrate of barytes	1½ ,,
Acetic acid	2 ,,
Alcohol	3 ,,
Water	10 ounces.

The iron and barytes are dissolved each in one-half of the water, then added to each other, after which it is decanted and filtered, and the acetic acid and alcohol then added, when it is ready for use.

It will readily be perceived that other nitrates, such as that of lead, which form insoluble sulphates, will answer instead of that of barytes.

A modification of this, for which photographers were indebted to Mr. John Spiller, saves all the trouble of decanting and filtration, inasmuch as it gives a clear solution at once. It is this:—

Protosulphate of iron	14 grains.
Nitrate of potash	10 ,,
Acetic acid	½ drachm.
Nitric acid	2 drops.
Water	1 ounce.

The decomposition produces protonitrate of iron and sulphate of potash, which are both soluble in water, the presence of the sulphate of potash not interfering with the developing.

If asked which of these developers we prefer, we unhesitatingly point to the latter, which we have used many hundreds of times.

In any case the development should be stopped by rinsing with water as soon as the details become visible.

To fix, cyanide of potassium should be employed in preference to hyposulphite of soda. The precise strength is not of vital consequence. Anything from five to ten grains per ounce will do, but it is to be remembered that, if strong, the fixing solution will quickly dissolve away the more delicate shades of the image. This is not an unmixed evil, for, when by over-exposure or over-development a too flat picture results, a considerable degree of vigour may be imparted by allowing the solvent action of the cyanide to act upon it and reduce the weaker portions to any desired extent, the lights remaining longer unaffected.

After the fixing has been completed, it will, in most cases, tend to impart greater whiteness to the silver deposit if a rather strong and old cyanide solution be poured over the surface and allowed to act for from two to four seconds.

The washing of the picture occupies a very brief time compared with that required to remove hyposulphite from a gelatine plate. The cyanide is removed from a wet-collodion plate by allowing the water from the tap to play upon the surface for one minute, after which the plate is dried by holding it before a clear fire.

If the bright deposit of silver be too metallic, owing to too great a proportion of nitric acid being in the developer, this may be remedied by adding more acetic acid; while, on the contrary, if it is of a too dead or chalky white, one or more drops of nitric acid will give the metallic lustre.

When sulphuric acid is added in liberal proportion to the iron developer, the image will possess an appearance as if composed mainly of tinfoil. This may prove useful when making a positive of an object composed of metal, but, in our estimation, it does not look well in the case of a portrait.

Bichloride of Mercury Solutions.—According to M. L. Vignon, as quoted in the *Chemical News*, these solutions are not stable, as their initial state varies rapidly with time.

Snow Crystals.—*Apropos* of this subject, recently treated upon in these columns, it may be stated that Professor G. Hellmans has recently published a work on the subject which is of considerable importance. He refers to different forms depicted by sundry observers, from the spikes, crescents, and daggers of Magnus in the sixteenth century to the elaborate and perfectly symmetrical representations by our own countryman, Professor Glaisher. There are some beautiful reproductions of Photographs by Dr. Neuhauss, taken last winter, and a lengthy discussion on the forms of the crystals leads to a proposed classification, which we need not here enter into, though it is evident that, the greater the number of such snow-crystal photographs available, the more valuable will they be.

Exploding Sodium.—*Apropos* of the accident to Mr. Birt Acres from the explosion of some sodium he was experimenting with a few months ago, it is evident that some conditions of such explosions are well known to chemists, so much so that Professor Rosenfeld has been endeavouring to trace the cause to its origin. It appears that the cause has hitherto been supposed to be due to the formation of a quantity of sodium peroxide, from the decomposition of which oxygen was liberated, mixed with the hydrogen in the main reaction. But no such oxygen was found, and in all experiments, when the explosion was brought about by the action of water, it was invariably found that the sodium was blown to powder from the centre outwards. Professor Rosenfeld attributes the explosion to the sudden dissolution of a hydrate of sodium formed at the outset.

Large Telescopes and their Object-glasses.—At the Royal Astronomical Society's meeting in December last, Mr. Alvan G. Clark, whose name is celebrated over the world as a maker of the largest known lenses for telescopes, greatly interested the members by the information upon the subject he was able to afford them. He has recently been making a telescope, known as the "Miss Bruce" Telescope, for Harvard University, the object-glass having a diameter of 24 inches, and he thinks very highly of the photographic capability of the instrument, some details of parts of which will be of interest to our readers. Thus the lens is 2 feet in diameter, and has a focus of 11 feet 3 inches. The glasses shown weigh about 100 lbs. each; that is, 400 lbs. weight of fine optical glass in the object-glass of the telescope, besides the prism, which of itself weighs 130 lbs., and is 3 inches thick at one edge, and seven-eighths of an inch at the other. He, with his sons, is now at work upon a 40-inch glass, which is well advanced. The form of lenses he employs in the Bruce Telescope, he stated, in reply to Mr. Edmund, is an ordinary double combination, and would come nearer to what is known in the market as a rapid portrait lens. These 40-inch lenses are 3 inches thick for the crown, and half that substance for the flint, seven-eighths and two and three-quarter inch respectively being the marginal thicknesses.

Photography and History.—Under this title, our contemporary, *La Nature*, has some very piquant remarks touching the great value that the future will place upon photographic representations of what are now current events. When a great public function takes place in which the highest of the land take part, it is not unusual for it to be recorded by some painter of skill; but what of the thousand-and-one social events of vast importance in the history of the nation? are they so recorded? Every one knows they are not; and this is not all. Instead of a photographer officially permitted to record such scenes, we have a hap-hazard system of "trusting to luck;" an undignified scramble too often takes place for a position wherein to place the camera, under circumstances of humiliation painful in the extreme to any self-respecting artist. Too often the man with the camera is treated as a social pariah, and the marvel is that we get the qualified amount of success that still does attend this kind of work. As we need not say, there are conspicuous instances to the contrary of this "scramble system," which possibly has been engendered by the nuisance the ubiquitous camera-carrier has proved himself capable of being; but at the same time it must be admitted that the time has come when history must be recorded by the lens as well as the pen, and steps should be taken to see to the carrying out of such a mode of recording in a satisfactory fashion. As *La Nature* says: "Why, when events of this kind are taking place, should not arrangements be made to enable official photographers to operate under favourable conditions? The photographs so obtained might be preserved in special archives as authentic representations of the facts of history. The value of these documents would augment year by year, and our descendants in the future would not view, without emotion, the scenes which had excited their ancestors."

FADING NEGATIVE IMAGES.

A FEW weeks back I described in these columns (page 684 of last volume) a somewhat peculiar case of fading of the negative image, that at the time I partly attributed to the fact of metol having been used as the developer, although it is difficult to imagine that silver reduced by that means should behave differently from the same metal reduced by pyro or hydroquinone. Yet the circumstances at that time were such as to lead to no other conclusion but that the image formed by metol did in some way differ from others, as in every case of fading or change that has taken place—and there were several—it was in metol-developed plates.

While I have since had reason to suspect, if not actually fix, the immediate cause of the fading, I am still in the dark as to the reason why only negatives developed with metol exhibit the peculiarity, while none on which hydroquinone, eikonogen, or amidol have been used show any signs of it. But, further than this, it is a puzzle to understand why, out of a number of negatives that have received precisely the same treatment in every way, some, or one, should change and the others not.

Such, however, is the case, and I am sending to the editorial office two negatives out of four that were exposed upon the same subject—a portrait—within fifteen minutes of one another. The plates were of the same make and brand, came, in fact, out of the same box, were developed with the same quantity of developer, and were, in absolute truth, treated throughout, from exposure to drying, in precisely the same way so far as it is possible to say that such was the case. Yet now, after a lapse of some six months, or perhaps more, on turning over the four negatives, one of them only has faded in the same peculiar manner previously described. The colour of the image, or what remains of it, is a reddish-brown, but the finer details and half-tones are almost represented by clear glass. The two negatives I am sending you were originally exactly alike in character, so you may fairly judge what amount of change has taken place.

As regards the cause of the fading, I think there can be little doubt that it arises from the use of the sample of old iodide of ammonium mentioned in my previous article, though it is difficult to explain why the solution should be so erratic in its action, and also what the precise change is. In order to make the matter clear to present readers, who may not have seen the previous article, I may perhaps be allowed to recapitulate the circumstances of the case.

Some months back, in a leading article, a method was given by which the removal of the last traces of hyposulphites from the gelatine film could be ensured, consisting in the treatment of the

plate with a solution of iodide of potassium, the effect being to convert any soluble silver salt remaining into silver iodide, and betray the presence of danger. A second fixing, of course, must follow. In putting this method into practice with some particularly thick films I was using, I substituted for iodide of potassium the ammonium salt, a sample that I had had about for several years, and which was badly decomposed. If I gave the matter a thought at all at the time, my idea would be that the fact of the decomposition and liberation of iodine would rather help matters than otherwise, but I fancy now that it is the cause of all the trouble.

In the first place, the colouration of the iodide of ammonium does not arise from free iodine alone, although there may be some iodine liberated, because, as I have found by experiment, the addition of an alkali does not remove the colour, hence there must be some other iodine compound present. But the question that I should now like to solve is this, What is the unstable compound that is left in the film that differs in no way in appearance from the ordinary negative image, and that is yet capable of, I suppose, an entire disappearance into "clear glass" if time be allowed? It will be noticed, in the faded negative sent you, that the finer details in the shadows have already entirely disappeared, and the rest of the image seems likely to follow. At the time I previously wrote, this particular negative had shown no sign of fading, for I went carefully through the whole stock developed about the same period as the ones that had then gone wrong; yet, after remaining unchanged for a period of perhaps four or five months, it eventually assumed its present condition. The probability is that the rest will follow in due course.

Perhaps the most curious part of the business is that, although the shadows at present are represented by almost bare glass, yet, if suitably treated, the detail will all come back again, proving that the image is still there, although in an invisible form. The two negatives I previously mentioned came back almost to their original printing quality, one being treated with bichloride of mercury, followed by ammonia, the other with sulphide of ammonium, the first giving the best result. Probably, if the second plate had been thoroughly washed before applying the sulphide, the result might have been better, though it is equally possible that the invisible image may be in a more or less soluble form, in which case washing would certainly tend to remove it.

Although I do not suppose any one will care to follow my example in using decomposed iodide of ammonium, and therefore the danger of fading from that cause is not great, still it would be rather interesting to know what the pinky-brown image consists of; so, if you like to show the negative to any of your chemical friends, or to try experiments upon it, I shall be very glad to hear the result.

W. B. Bolton.

JOTTINGS.

If the writer of a letter in the last number of one of your contemporaries is correctly informed, Captain Abney, the President of the Photographic Society of Great Britain, will not stand for re-election to that position at the forthcoming annual meeting of the Society. That general regret will be expressed at Captain Abney's decision may, I suppose, be taken as assured, while his long and honourable record of service to the Society, coupled with his many qualifications for the Presidential chair, must undoubtedly make it difficult for the members to find a worthy successor to him. Just now, it appears to me, the best kind of President the Society could have would be a level-headed, unprejudiced man of business, with a capacity for mastering small details, *au courant* with modern photography in all its aspects, and filled with the determination to place the Society in a firm position as the representative and authoritative body to which all classes of photographers could, upon necessity, turn. The correspondent of your contemporary suggests Mr. J. W. Swan. I do not know sufficient of Mr. Swan personally to be able to discuss his qualifications for the Presidency, but not even the glamour attaching to his name and achievements shall prevent me from pointing out, that if Mr. Swan's interests in the affairs of the Society may be gauged from the way in which he has performed his duties as a member of the Council, and if also from the latter data one may fairly deduce the amount of time he is likely to place at the Society's disposal in a more exalted position, the result can scarcely be considered satisfactory; for, last year, according to the Society's journal, out of ten meetings of the Council, Mr. Swan did not attend one. I do not think the members of the Society need seek beyond the present four Vice-Presidents for the most deserving, if not the best, successor to Captain Abney, and I at any rate shall let one of these gentlemen have my nomination and my vote.

During February and March there will be an Exhibition of oil and water-colour paintings, &c., at the Walker Art Gallery, Liverpool, and I observe that a section of the Exhibition will be devoted to photography. This is as it should be, and photographers should be glad of, and take advantage of, the chance of having their work hung contiguous to selected examples of the older arts. What I can't understand about this Exhibition, however, is, the fact that, in the photographic section, "no charge for space will be made, except in the case of professional photographers, whose contributions will be subject to the usual rate." I quote literally from the paragraph on page 27 of the last number of the Journal. What is the object of the regulation? To exclude professionals? Surely not; and yet it looks uncommonly like it. Perhaps Mr. Charles Dyall, the curator, will explain why a distinction is to be made between amateurs and professionals in the matter of charging for wall space. For the life of me, I am unable to make out why there should be any.

"It is fallacious to suppose that it makes any difference whether the front or the back lens of a rapid symmetrical or similar type of combination is used when it is desired to employ a single lens for view-taking, but in doing this it is desirable to alter the position of the stop." Another quotation, this time from a Society report. I fancy that there *is* a difference between the front and the back combination of many so-called symmetrical lenses, arising from the fact that such lenses are not composed of truly symmetrical compounds, the focus of one being different to that of the other. And I also fancy (but I am not sure) that the Editor of this Journal has recommended this method of symmetrical lens construction.

I am glad to see that steps are being taken by photographers to form themselves into a union for protecting themselves against the piratical practices of the illustrated press, and I also congratulate the leading lights of the profession on giving their brethren all over the country an opportunity of becoming members of the union. The movement is bound to gain by being worked from the London Chamber of Commerce, as it removes any possible cause for cavilling on the score of cliqueism or interestedness. If ever there was a cheap and easy opportunity for the professional man to help himself, it is that pointed out to him in the last number of the Journal. Once let it be known by the press and public that some three or four thousand men are banded together in self-defence, and an almost automatic respect for their rights of property will take shape. Besides the good effect which the mutual agreement to charge a minimum fee of 10*s.* 6*d.* for the use of a copyright photograph must create, the future possibilities of the Photographers' Copyright Union for defensive and ameliorative purposes are so great, that I unhesitatingly echo the Editor's advice, and say, Join.

One of the specifications of patents recently published (page 818, December 22) is for grooved metallic strips for plate boxes, the bottom part of each groove being made of "an angular figure or of a semicircular figure, and the parallel sides of the grooves of such depth that the surface of the grooves with which the photographic plates can come into contact, when the plates are packed or stored in the said grooves, is reduced to a minimum. That is to say, instead of the edges of the photographic plate bearing on the whole surface of the sides of the grooves, as in grooved strips of the

ordinary kind, the said plates, when the improved grooved strips are used, bear principally against the angular or curved bottoms of the grooves of the strips." I may be wrong, but I was under the impression that plate-washing tanks, fitted with grooving of this nature, were articles of commerce. At any rate, if I have not used such, I am greatly mistaken. COSMOS.

HURTER & DRIFFIELD; OR, THE MEN AND THE MONEY BAGS.*

DILUTION OF THE DEVELOPER, &C.

HAVING now shown the important effect which stopping the development at different stages has upon our negatives as a means of altering the gradation, we will pass on to the consideration of a second modification which is made in developing, I mean the extent to which a developer is diluted with water—in other words, its concentration. There are many ideas prevalent as to the reasons for altering the concentration of developers, and many different opinions exist as to the results obtained by so doing, but (so far as investigation has gone in the matter) it appears the only effect produced by the alteration we make in the degree of concentration is that of quickening or slowing the process of development. In making this statement, I omit from the question the consideration of effect of fog upon the image, which matter I shall deal with later. I only wish to remark here that various effects that are attributed to the developer are, in reality, due to alterations in the amount of fog present. There are two main reasons for altering the concentration of the developers, which I will illustrate by taking examples. As I have already so fully explained, we require in our negatives, above all, to get the desired range of gradation, and it is, of course, expedient to employ a developer of such concentration that, while it operates with sufficient rapidity, it will not be too fast for convenience of observation. Therefore, the degree of concentration naturally varies according to the high or low range of gradation in the subject.

Thus, in the case of photographing a faded print, in which the range of tone is perhaps less than two to one, we want to widen out the tones, and for this purpose the negative is made as dense as possible. Therefore, in order to accomplish this in a reasonable time, we employ a strong developer. But, on the other hand, when developing negatives of interiors, and such other subjects as usually have a very wide range of gradations, we require to compress the range, to do which (as we have seen) the development is stopped at an early stage, and a weak developer gives us time to examine the image without fear of over-developing. The second reason arises from exposure. Thus, if a plate is inclined to be under-exposed, it develops slowly and with difficulty. We therefore use a stronger developer to economise time. On the other hand, a fully exposed plate develops quickly and readily; we therefore employ a weak developer to give time for observation. I, of course, make no reference here to cases where portions only in the image are under or over-exposed.

The next variation of development which I shall briefly refer to is the temperature of the developing solution. It is well known that a warm developer acts more rapidly than a cold one. Also that a warm developer gives more fog, which I shall deal with presently; but, excepting the production of fog, there is no action which is known other than that of hastening or slowing development.

MODIFYING THE CONSTITUENTS OF THE DEVELOPER.

The only element that now remains for consideration (as regards modifications in the developer) consists in altering the relative proportions of its constituents. This is a point to which I must call your most careful attention, as it is on this modification in his developer that the photographer is accustomed to rely to produce any desired variation in the gradations.

In approaching this important question it is probable that I shall appear to be putting forward a photographical doctrine which (at first sight) may seem to run counter to the experience of many practical workers present; therefore I wish to impress upon you the fact that the revolution of ideas which has been set afoot by the researches of Hurter & Driffield is founded upon what is undoubtedly one of the finest technical investigations ever associated with photography. I have no hesitation in saying that there never has been a photographic technical investigation conducted with greater impartiality of spirit and exactness of detail than the experimental tests which have been carried out by these gentlemen to arrive at the results which I am putting before you. To put the gist of the matter in a single sentence, the idea that the photographer has, that he can, by modifying his developer, effect local changes in his gradations, is disproved by the researches of Hurter & Driffield, excepting in so far as the relative gradations are modified by the presence of more or less fog. The practical outcome of the recognition of this new doctrine will be that we shall rely more upon exposures, and more upon the thickness of our sensitive films in cases where we wish to preserve the full delicacy of gradation, especially with subjects having widely different gradations. We shall further pay much greater attention to stopping development at the best moment. To explain the errors which have occurred in the inferences drawn from observation during development, let us take an example in the case of our old friend, the pyro developer. There are two alterations in this developer commonly made with the view of producing local changes in the gradations during development, viz., increasing the quantity of alkali and increasing the quantity of bromide. The idea of adding more alkali is that the substance has the power of adding local density to the shadows when insufficient, and further, that if the shadows have been under-exposed, to some extent it will bring them out. On the other hand, the idea of adding bromide is that of lessening the density of the shadows when they are over-exposed.

By the observation of the effects of these modifications, we have been led to believe that alkali has the power to accelerate the development of shadows, without (at the same time) having a corresponding effect upon the high lights; and that bromide has the power of retarding the development of the shadows, without also affecting the high lights. As a matter of fact, the high lights are affected in exactly a proportionate manner; and the reason why this is not noticed by the operator, in the case of adding alkali, is simply because he is observing the growth of the shadows while (owing to the blackness of the high lights) their growth is not visible. We all know that, in a dark room, the gradations in the high lights are very difficult to distinguish; but, if the negative were held up to a strong light, the growth of its high lights simultaneously with the shadows would be perfectly obvious. As in most principles, there are one or two exceptions to the rule; and I will point out to you one exception to this general principle of equal development. It is when the film is so thin that the high lights are already through the film at the time of adding the extra ammonia. Under such circumstances, of course, the high lights cease to develop, while the shadows continue to grow in density; but WHY do the high lights remain stationary? Simply because there is no more silver to be reduced. The addition of the alkali, beyond hastening the development and fogging the plate, has no effect whatever; the development of the shadows and the checking of the high lights would have inevitably taken place, whether the ammonia were added or not. And now, if, as I have endeavoured to show, we cannot localise our development, we can, at any rate, recognise our error. The operator is perfectly accurate in identifying the visible results of these additions to his developer, but he has attributed properties to bromide and ammonia which they in no wise possess.

An exactly similar mode of reasoning takes place in faulty exposures. For example, in the case of the shadows being somewhat under-exposed, the addition of alkali is found to rapidly bring out the details. This leads the operator to suppose that the alkali has in some way compensated for the exposure, whereas it has done nothing more than hasten the appearance of the details. Whatever details appear under the influence of the extra alkali would have appeared equally well without, providing a longer time was given.

Again, in the case of over-exposure, the bromide is added, which we knows slows the development; but as to preventing the shadows in a greater proportion than it does the high lights, investigation shows that this is not the case.

It may be said, therefore, that the whole and sole effect of these chemical additions, beyond that of hastening or slowing the development, resolves itself into a question of adding fog to the negative with alkali, or lessening the fog with bromide.

FOG.

Having now considered the various changes which are made in the developer, the only point remaining for discussion is the effect which fog has upon our gradations.

Now, unfortunately, up to the present no actual investigation has been published as to the function which fog exerts in our negatives, therefore I wish you to understand that the remarks I am about to make on the subject are not in any way attributable to Hurter & Driffield. I have every reason to believe, however, that the particulars I am about to put before you are, so far as they go, accurate,

* Concluded from page 23.

and that they are the natural deduction from the researches of Hurter & Driffield.

It is only right, also, that I should say that these gentlemen are still engaged in their investigations, more especially in reference to this difficult subject concerning the influence of fog.

There is no doubt that the presence of more or less fog is one which, in a large measure, determines the printing qualities of negatives, and by a recognition of the principles appertaining to it some considerable developments of our work are capable of being accomplished.

At first sight, it would appear that fog, by its very nature, is detrimental to our negatives, and, actuated by this idea, we are, in some cases, liable to pursue a mode of working which is directly opposite to the requirements of the case. It is thought by many that fog should be entirely avoided, whereas, as a matter of fact, fog acts as a most valuable and essential agent in obtaining printable negatives. It may at once be said that no dry-plate negative is absolutely free from fog, and, moreover, that in a vast number of cases a considerable amount of fog is actually an advantage. Many photographers have a preference for heavily fogged negatives, while others will go so far as to strain every nerve to avoid fog, thinking that a bright-looking negative is always the best, and both these preferences have very substantial advantages. But a wider experience shows that there are many negatives in which the absence of fog is desirable, and others of which the reverse is the case.

The effects of fog are totally different, according to whether the fog is evenly distributed all over the film or graduated over the film. Let us take the first of these conditions.

The effect of fog or stain on a negative, if evenly distributed, is that of simply lengthening the time of printing, in the same way as putting a piece of tissue paper over the frame does; that is to say, it simply weakens the light, and does not alter the relative gradations of the negative. There is a very interesting point here, which, though foreign to my subject, must not be forgotten; many printers say that, when a negative is covered with tissue paper, so that it prints more slowly, a brighter print is obtained than when printed quickly.

I hope to deal with this matter on a future occasion, but all I wish you to recognise here is, that the effect of fog evenly distributed is similar to that of using a paper over a negative, or printing in a weaker light, the range of the gradations, as well as the intermediate gradations, being in no way altered.

Graduated Fog.

We now come to the consideration of the effect of graduated fog. We know that when the alkali in the developer is increased, the other constituents remaining constant, the amount of fog also increases. This being the case, it is not difficult to show how the fog may be graduated so that certain parts of the negative may have more fog than others, and perhaps the simplest method of explanation will be by means of an example. Let us suppose we are developing a negative of an interior or other subject in which there is a wide range of gradation, and, in consequence, the high lights are developed through to the back of the film, or nearly so, while the shadows refuse to develop sufficiently. What do we do in such a case? We simply add alkali, which, as well as hastening development, also fogs the plate. But the shadows are fogged more than the high lights. Why is this? Because there is a much greater quantity of unreduced silver salts in the shadows as compared with that of high lights.

And we find, when printing with such a negative, the details in the shadows are preserved, whereas without the fog they would have merged into a patch of black by over-printing. I think we can now clearly appreciate that the function of this graduated fog is similar to that of having a complicated arrangement of local masks by which the shadows at different parts of the negatives are restrained from over-printing, and, moreover, that the masking is proportionately more or less heavy in accordance with the varying densities of the shadows, or, in other words, the function of the fog is to compress the gradations in the negatives to within a range suitable for printing.

I might go on multiplying my examples of cases where fog is useful, and examples of modes by which it may be graduated, but they all illustrate the principle that the fog (by acting as a graduated mask) compresses the range of gradation to within the proper limits for printing, and (at the same time) assists in obtaining a full representation of details.

Before dismissing this point, we must not overlook the fact that the action of fog in the example I have chosen is dependent upon the comparative quantities of unreduced silver salts present in different parts of the film, and that, therefore, we were employing a thick film (in which a quantity of silver salt would be largely in excess of that reduced by the developer and forming the image). The results of fogging the plate by the method given would be very different; for, as there would be a quantity of unreduced silver salt distributed almost equally over the plate, the fog would no longer be perceptibly graduated.

Retrospective.

I must now conclude by reminding you in a few words of the ground over which we have passed.

In the hope of, in some small measure, clearing away the cobwebs of misapprehension which have been so long and so largely associated with the subject of gradation, I devoted the early part of my lecture to explaining, in as simple language as possible, the important influence which the stage at which we stop development exerts upon our work. I then proceeded to show how qualities attributed to modifications in the developer, are, in many respects, quite contrary to their real function. And, finally, I endeavoured to put before you the real function which fog performs in modifying our gradations.

Also, I should have liked to have enlarged upon the subject of what really constitutes latitute in exposure, for a misconception of this element in photography is, indeed, one of the main secrets of the serious misunderstandings which prevail. I mean to say that it is absolutely necessary to form in our minds a conception of the difference which exists between producing a picture which contains a sufficient number of tones to produce a pleasing effect, and a picture which really reproduces the tones of the original. In connexion with this point, I must caution you against the tendency which we have to judge effects by what we see in small photographs, without comparing them with more perfect specimens of their type. Errors and shortcomings which would be palpable in a life-sized head are imperceptible to the eye in a cabinet photograph. But the tendency in many cases is to form an opinion from the observation of only small work.

I sincerely trust that I have avoided all spirit of dogmatism in my remarks, for it is my earnest wish that, whether you accept the logical deduction from Hurter & Driffield's work as correct or not, you will, in either case, pursue the subject to a definite conclusion, impartially and without prejudice. E. Howard Farmer.

CONTINENTAL NOTES AND NEWS.

"Le Moniteur de La Photographie."—Our esteemed Parisian contemporary, which is now in the thirty-third year of its age, commences the new year in a fresh guise, being reduced in size from quarto to octavo, and having a cover. The new arrangement, says the Editor, will permit of the frequent introduction of illustrations.

Photographic Exhibition in Paris.—On Wednesday, January 10, there was opened, at La Galerie Petit, 8, Rue de Sèze, Paris, an Exhibition of photographs, organized by the Photo Club de Paris. The Exhibition, which is to remain open until the 30th of this month, pays special regard to the art side of photography. In an early number we hope to allude to it in detail.

Anaglyphes.—The December number of the *Revue de Photographie* contains a supplement in the form of a picture printed in red and blue, which, when looked at by the unaided vision, presents a somewhat confused, if not chaotic, appearance, owing to the non-superposition of the colours. It is said, however, that, if the picture be looked at through a pair of spectacles having red and blue glasses, each eye only perceives one of the images, and a stereoscopic effect is obtained. Our contemporary credits the invention of the "anaglyphes" to M. Ducos du Hauron.

French Photo-Russophilism.—The visit of Admiral Avellan and the other officers of the Russian Fleet to Paris during the latter part of last year aroused no little enthusiasm among our volatile neighbours. Photography played an important part in the proceedings. The Admiral and his officers visited the establishment of M. Paul Nadar, the versatile and accomplished Director of

our handsome contemporary, the *Paris Photographe*, and M. Nadar was honoured in securing the autographs, with appropriate patriotic inscriptions, of his distinguished visitors, and also took their photographs. The December number of the *Paris Photographe* contains a sympathetic article alluding to the visit, and, besides reproducing the autographs and inscriptions, gives a fine gravure photograph of the Admiral, and a group containing portraits of the forty-two officers of the fleet who accompanied him. To parody an old saying, "This is enterprise indeed."

Colouring Gelatino-bromide Prints.—The *Archiv* gives the following plan for getting different colours on bromide prints. The prints are feebly developed with eikonogen, fixed, washed, and then immersed in a solution of—

Nitrate of lead	4 parts.
Red prussiate	6 „
Water	100 „

This bleaches the image, which may then be coloured, thus:—

Brown.

Schlippe's salt	10 parts.
Ammonia	5 „
Water	150 „

Yellow.

Neutral chromate of potash	4 parts.
Water	100 „

Green.

Immerse the yellow prints in—

Iron perchloride	1 part.
Water	10 parts.

Red.

Immerse the yellow prints in—

Chloride of copper	1 part.
Water	10 parts.

Nickel Green.

Chloride of nickel	1 part.
Water	10 parts.

Orange.

Mercury bichloride	3 parts.
Potassium iodide	4·5 „
Water	100 „

Action of Metallic Copper on Sensitive Plates.—At a recent meeting of the Société Française de Photographie, Commandant Moessard stated that he had left a plate in a slide for three months, the sensitive surface being exposed to, but not in contact with, a band of metallic copper. The result on development was an image of the copper band, which, even at a distance, thus appeared to have some effect on the sensitive surface.

The Combined Bath Again.—At the meeting just referred to, a letter from M. E. Audra was read, in which he offered a silver medal for a simple, practical, and certain method, with separate baths, of toning and fixing gelatine and collodion positive prints. He says that the uncertainty of the results obtainable with the combined bath, and, above all, the instability of the proofs, which are always more or less sulphurated, has led him to think that it would be useful to stimulate interest on the point.

M. Marey.—M. Janssen is succeeded in the Presidency of the Société Française de Photographie by M. Marey, whose work in photographing rapidly moving objects is well known.

THE FORTHCOMING CONVENTION AT DUBLIN.

On Friday, January 11, the first general meeting of the Reception Committee, formed to make arrangements for the visit to Dublin next July of the Photographic Convention of the United Kingdom, was held in the offices of the Photographic Society of Ireland.

Sir Howard Grubb presided, and, in opening the proceedings, he said the Photographic Convention of the United Kingdom, which was to hold its meeting for 1894 in Dublin, was a peripatetic Society. It occupied the same position to votaries of photography as the British Association did to science generally. He looked upon it as one of the strongest proofs of the wonderful advance of the photographic art that this Society had arisen, and had done good work for the last seven or eight years. It held its first meeting in Derby in 1886, and in subsequent years in Glasgow, Birmingham, London, Chester, Bath, Edinburgh, and Plymouth. This year its members proposed, at the invitation of the Photographic Society of Ireland, to hold their meeting in Dublin. It was the first occasion they came out of Great Britain. He hoped that their meeting here would be no less successful than the meetings of other societies that had been held in Dublin, and he trusted they would be able to look back upon it as a record meeting. Before the Convention separated at Plymouth they appointed five gentlemen—Dublin men—to be a local council. These five gentlemen were Professor Scott, Mr. Hedley, Mr. Mayne, Mr. Ruthven, and Mr. Werner. They had a meeting here, and had made preliminary arrangements, and had organized a Reception Committee, and appointed an Hon. Secretary. They met on several occasions, and communicated with a number of gentlemen likely to help in the matter, and the result was that they had got acceptances from several gentlemen who would form the Reception Committee, and practically secure the success of the Convention. This was now the first meeting of that general Reception Committee, from which they would appoint a good working Executive Committee to take charge of the arrangements. The Convention would last a week. There would be the reception on the Monday and an address from the President. On the following day there would be excursions. On the Wednesday, the reading of papers, with a *conversazione* in the evening. On Thursday, papers and excursions. On Friday they would have the annual dinner, and they would wind up the visit on Saturday. They expected from 150 to 200 visitors, and at least 400*l.* would be required to give them a hospitable reception.

Mr. John A. C. Ruthven, Hon. Secretary, submitted the names of the gentlemen forming the Reception Committee, as follows:—

W. E. Adeney, F.C.S., J. J. Alcorn, Walter Armstrong, B.A., Oxon. (Director of National Gallery of Ireland), Valentine Ball, C.B., LL.D., F.R.S., F.G.S. (Director of Science and Art Museum), C. B. Ball, M.D., M.Ch., F.R.C.S.I., Professor W. Barrett, F.R.S.E., A. H. Benson, M.D., F.R.C.S.I., W. Bewley, B.A. (Hon. Treasurer, P.S.I.), Hon. Judge Boyd, LL.D., W. H. Brayden (Editor, *Freeman's Journal*), James Brennan, R.H.A., M.R.I.A., Robert Browne, J.P., M.D., Edward Byrne, F.I.J. (Editor, *Daily Independent*), James Carson, C.E. (Vice-President, P.S.I.), Professor Sir C. A. Cameron, M.D., F.R.C.S.I., John Chancellor, Professor E. M'Dowell Cosgrave, M.D., F.K.Q.C.P., Alderman Sir Henry Cochrane, D.L., Professor Grenville Cole, F.C.S., Alexander Conan, Professor D. J. Cunningham, M.D., F.R.S., Sir Thomas N. Deane, R.H.A., the Right Hon. V. B. Dillon (Lord Mayor of Dublin), H. C. Draper, F.C.S., F.I.Inst., George Drury (Hon. Secretary, Dublin Arts Club), Charles Eason, junr., M.A., Thomas Farrell (President, Royal Hibernian Academy), C. E. Fitzgerald, M.D., F.R.C.P., Professor Fitzgerald, F.T.C.D., F.R.S., D. Edgar Flinn, M.D., F.R.C.S.I., William Frazer, M.D., M.R.C.P.L., F.R.C.S.I., A. M. Geddis, Samuel Geoghegan (Vice-President, Inst. C.E.I.), J. M. Gillies (*Freeman's Journal*), H. Goodwillie, the Right Hon. Ion Trant Hamilton, H.M.L., Edward Hamilton, M.D. (President, Royal College of Surgeons, Ireland), Professor Walter Noel Hartley, F.R.S., J. H. Hargrave, B.A., M.E., A.M.I.C.E., R. A. Hayes, M.D., F.R.C.S.I., M. Hedley, F.R.C.V.S. (Vice-President, P.S.I.), J. Malcolm Inglis, J.P., R. M. Inglis, H. A. Ivatt (Hon. Secretary, Inst. C.E.I.), Professor J. Joly, M.A., D.Sc., F.R.S., J. M. Keogh, T. H. Longfield, F.S.A., Professor, E. J. M'Weeney, M.A., M.D., M.Ch., M.A.O., William Lawrence, Thomas Drew, R.H.A., F.R.I.A.I., W. F. Cooper, J. M'Grath, LL.D. (Secretary Royal University of Ireland), George Mansfield, J.P. (Past President P.S.I.), Thomas Mayne, Louis Meldon, J. C. Meredith, LL.D. (Secretary Royal University of Ireland), Right Rev. Monsignor Molloy, D.D., D.Sc., R. J. Moss, F.C.S., F.I.C. (Registrar Royal Dublin Society), John G. Nutting, F. Harman Orr, W. Kaye Parry, M.A., C.E., G. V. Patton, LL.D. (Editor *Daily Express*), Greenwood Pim, M.A., F.L.S., James Talbot Power, D.L., Right Hon. Viscount Powerscourt, K.P., D.L., Professor J. M. Purser, M.D., D.Sc., F.R.C.P., Professor Arthur A. Rambaut, M.A., D.Sc. (Astronomer Royal of Ireland), Professor J. Emerson Reynolds, M.D., F.R.S. (Past President P.S.I.), F. J. Richardson, John L. Robinson, C.E., M.R.I.A., R.H.A., Right Hon. the Earl of Rosse, K.P., D.C.L., F.R.S., LL.D., Professor J. A. Scott, M.A., M.D., F.R.C.S.I. (President Photographic Society, Ireland), J. A. Scott, J.P., F.I.J. (Editor *Irish Times*), George Scrivens, M.D., B.Ch., Alderman Sir Robert Sexton, D.L., J. R. Simpson, J. Chaloner Smith, C.E. (President Institute Civil Engineers of Ireland), W. G. Smith, M.D. (President Royal College of Physicians), V. E. Smyth, W. Thornley Stokes, M.D. (Vice-President F.R.C.S.I.), Professor Sir William Stokes, M.D., F.R.C.S.I., Leonard R. Strangways, M.A., Professor C. R. C. Titchborne, Ph.D., F.C.S., C. Uniacke Townshend (Vice-President R.D.S.), A. M. Vereker, Alfred Werner, E. A. Werner, F.C.S., F.I.C., J. R. Wigham, J.P. (Hon. Secretary Dublin Chamber of Commerce), W. W. Wilson (M. Inst. C.E., M. Inst. M.E., M.R.I.A.), George Orr Wilson, M.A., J. H. Woodworth, John A. C. Ruthven, A.M. (Inst. C.E.I., Hon. Secretary).

It was announced that other influential gentlemen had been written to with a view to adding their names to the Committee.

Mr. Adeney moved: "That this meeting approves of the action of the Photographic Society of Ireland in inviting the Photographic Convention of the United Kingdom to hold its annual meeting for 1894 in Dublin, and pledges itself to use every effort to secure the success of that Convention."

The resolution was passed.

The following gentlemen were selected from the General Committee to act as an Executive Committee, with power to add to their numbers:—

Messrs. W. E. Adeney, J. J. Alcorn, W. Bewley, Hon. Judge Boyd, James Brennan, James Carson, Sir Charles Cameron, Dr. Cosgrave, Sir Henry Cochrane, Professor Grenville Cole, Alexander Conan, Sir Thomas N. Deane, H. C. Draper, George Drury, Dr. Edgar Flinn, A. M. Geddis, Samuel Geoghegan, H. Goodwillie, J. H. Hargrave, M. Hedley, J. M. Ingliss, R. M. Ingliss, H. A. Ivatt, J. M. Keogh, W. Lawrence, Thomas Drew, W. F. Cooper, George Mansfield, Thomas Mayne, Louis Meldon, Dr. J. C. Meredith, John J. Nutting, F. Harman Orr, F. J. Richardson, John L. Robinson, Professor Scott, J. R. Simpson, V. E. Smyth, Leonard R. Strangways, A. M. Vereker, Alfred Werner, E. A. Werner, J. R. Wigham, W. W. Wilson, and John A. C. Ruthven (Hon. Secretary).

Mr. Werner proposed a subscription list be opened to defray the necessary expenses in connexion with the meeting of this Convention.

The Chairman said the Executive Committee would, on a future date, call a general meeting of the whole Reception Committee, and report what they had done.

QUADRUPLE BINDING STRIPS FOR LANTERN SLIDES.

To some the *bête noir* of lantern slide-making is the binding, and facilities for this are often being afforded to the dilettante slide-maker. The latest of these is brought under onr notice by Messrs. Wormald & Co., New Malden, Surrey, whose new form of binding strip has been designed to obviate the trouble experienced by many amateurs in binding slides with the 14-inch strip (in one length) ordinarily in use, and it especially overcomes the difficulty of making satisfactory and neat corners. The strips are in four 3½-inch lengths, in two patterns, as shown below, two of each pattern being used in binding a slide, as the "Quadruple" strips are much easier to use.

The strips (in pairs) should be laid on a board, and the gum moistened



(not wetted) with one stroke of a damp brush, same way as ordinary strips. To make the gum of binding strips additionally adhesive, it is recommended to use paste instead of water.

A tongued pair of the strips (one at a time) are first attached to opposite edges of the slide by placing one edge of the glasses downwards in centre of the moistened strip, to which it will adhere, so that you can then turn that edge upwards to enable you to turn down and smooth the margins with the fingers in the usual way—the two tongues are fastened with the fingers down the edge of each of the (four) corners, so as to effectually prevent dust from getting between slide and cover glass, and serve as a junction for the other (mitre-cornered) pair of strips, which are then fixed (in similar manner) on the third and fourth edges, giving a neat and finished appearance to the slide. The tongues are also useful to show centre of the strip on which to place the edges of slide, so that equal widths are provided to turn over the front and back, while the strips with mitred corners enable a like precision to be attained in binding the other two edges.

Our Editorial Table.

PHOTOGRAPHISCHES TASCHEN-LEXIKON.

By Dr. JULIUS SCHNAUSS. Halle a. S.: Wilhelm Knapp.

IN this useful little manual Dr. Schnauss has gathered together the most common photographic terms, and has given them the German names, with their French and English convertibles, elucidating the full meaning of those terms in German. A second section of the book is devoted to rendering the English terms into German, a third to French into German, while in a fourth many Latin names are Germanised. Many will find this lexicon, which bears the impress of careful compilation, of great assistance.

FROM the Société Generale D'Editions, 21, Boulevard Saint-Germain, Paris, we have received three brochures, designed for the library of the amateur photographer. These are *Résumé de Photographie, Economique et Pratique*, by Ch. Finaton, a useful guide to a beginner; *La Photo-collographie Pratique*, by E. Rouanet, and *Guide Pratique de Photo-collographie*, by P. Bernard, two capital little treatises on collotype, and likely to be of service as introductory guides.

DAS ATELIER UND LABORATORIUM DES PHOTOGRAPHEN.

By Dr. JOSEF MARIA EDER. Halle a. S.: Wilhelm Knapp.

THIS should be a book of extreme interest to the professional photographer, as it concerns itself entirely with the studio aad its contents. Commencing with the construction of studios—a subject which it discusses with great completeness—it passes to lighting, blinds, reflectors, head rests, &c., and next devotes itself to the dark room and development and printing accessories, &c. In the course of 170 pages some 325 illustrations are given, which are an education in themselves, as constituting a pictorial guide to modern practical apparatus. Undoubtedly a valuable photographic *vade mecum*.

COMPENDIUM DER PRACTISCHEN PHOTOGRAPHIE FÜR AMATEURE UND FACHPHOTOGRAPHEN.

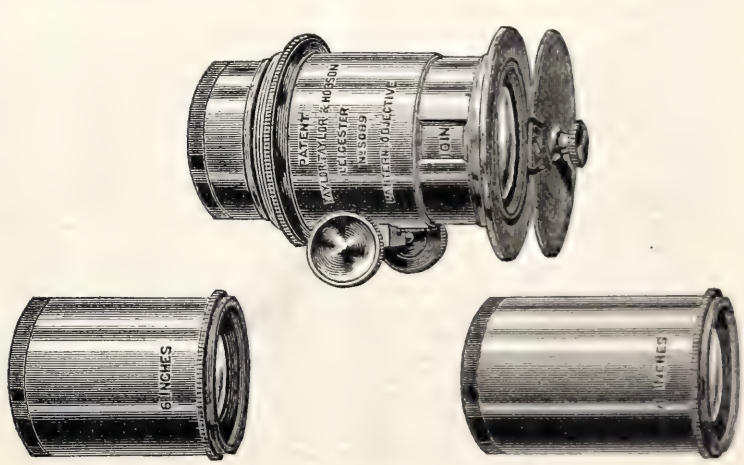
By F. SCHMIDT. Karlsruhe: Otto Nemnech.

THIS is a work of some 400 pages, and about sixty illustrations, which goes fairly exhaustively into the theory and practice of most branches of modern photography. It is prefixed by some useful historical notes. It is well printed and got up (as, indeed, most German books on photography are), and should be useful to those desiring their photography served up to them with a strong flavour of theory underlying its teaching.

MESSRS. MARION & Co. have issued a series of cabinet portraits of ladies connected with the stage—"leading actresses"—which are to sell at a low price—6*d.* each. They are printed in permanent ink. We can recommend them to photographers as studies of posing, for, whatever other qualities actresses may possess, their pose and expression are usually worthy of study and imitation.

TAYLOR, TAYLOR, & HOBSON'S LANTERN OBJECTIVES.

WE are pleased to see that this firm are adopting a very useful system in respect of their lantern objectives, viz., a series of lenses of different foci, set in plain tubes, for which the main mount, actuated



by rack and pinion, forms the carrier. The convenience of such a system is very great, for, when a suitable standpoint has been determined upon for the lantern, it then becomes an easy matter to select the lens best adapted for filling the screen, of whatever size it may be. The set shown us are of the foci respectively of 6, 8, and 10 inches. The first two have an aperture equal to *f*-4, the last being *f*-5·6. They are cemented compounds.

News and Notes.

PHOTOGRAPHIC CLUB.—January 24, *The Carbon Process*, by Mr. E.W. Foxlee.

LEWISHAM CAMERA CLUB.—January 19, *Hand-camera Work*, by Mr. W. Welford.

WOOLWICH PHOTOGRAPHIC SOCIETY.—January 25, at St. John's Schools, demonstration, *Sandell Plates and Films.*

PUTNEY PHOTOGRAPHIC SOCIETY.—February 5, Mr. T. Bedding on *Stereoscopic Photography.* 22, Mr. G. Ardaseer on *Home-sensitised Paper.*

MR. S. S. PRIESTLEY, of Messrs. Priestley & Sons, photographers, Egremont, Cheshire, died last week from the effects of a fall. He was sixty-seven years of age.

THE South London Photographic Society have been invited to make an exhibition of their members' work at the Central Photographic Club, which they have arranged to do.

WE are informed that Mr. J. J. Elliott, of the firm of Elliott & Fry, started on Saturday last in the *Dunottar Castle* for a trip to South Africa. We wish Mr. Elliott a pleasant journey and a safe return.

SOCIETY OF ARTS.—On February 7, a paper on *Reproduction of Colours by Photography* will be read by Captain Abney, C.B., F.R.S. Cantor lectures will also be delivered by Captain Abney, on *Photometry.*

WEST LONDON PHOTOGRAPHIC SOCIETY.—January 23, *Hand Cameras*, by Mr. F. P. Cembrano, jun. The Fifth Annual Exhibition of Members' Work will be held on February 13 and 14, at the School of Arts and Crafts, Bedford-park, Chiswick.

BRISTOL INTERNATIONAL PHOTOGRAPHIC EXHIBITION.—We are informed that in the announcement of awards made by the Judges, the name of Mr. F. W. Edwards, of Peckham Rye, should have been given as that of the winner of bronze medal for exhibit 1012 in Class XXI., and not Mr. F. Hollyer.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, January 23, at eight p.m., at 50, Great Russell-street, W.C., *Lantern-slide Processes.* It is hoped that all the current, and some of the past, processes will be illustrated. The Secretary will be glad to hear from any one who can contribute specimens or information.

OWING to Mr. John Howson's numerous engagements, he has been compelled to resign the office of Treasurer of the Central Photographic Club, which he accepted *pro tem.* Mr. E. J. Wall, of 1, Creed-lane, Ludgate-hill, E.C., has been appointed to succeed him. Mr. W. F. Slater has also been appointed Hon. Librarian, and Mr. F. J. Carter Hon. Lanternist of the Club.

CREWE AMATEUR PHOTOGRAPHIC SOCIETY. Eestablished January, 1889. Headquarters at the Studio, Chester Bridge, Crewe. Meetings held on Thursday evenings. The following are the recently elected officers:—*President:* Rev. W. G. Rainsford, D.D.—*Vice-Presidents:* Messrs. Wilmot Eardley and E. Booth.—*Committee:* Messrs. T. Popplewell, E. Crooke, and J. Lewis.—*Auditors:* Messrs. S. H. Hayward and T. Wareham.—*Hon. Treasurer:* Mr. John Cherrey.—*Hon. Secretary:* Mr. Thomas Gorrell, 106 Edleston-road, Crewe.

A SERIOUS fire occurred at Grantham early on Tuesday, Jan. 9th, completely gutting the photographic studio, workrooms, and shops occupied by Mr. H. J. Bliss, photographer, of Grantham and Newark. The fire was discovered by the police at twenty minutes past twelve, and raged furiously, in spite of the strenuous efforts of volunteer fire brigade and police until three a.m. The two adjacent buildings suffered severely by fire and water, but fortunately no lives were lost. The origin of the fire is unknown. Some of the books were saved, but that was all. The property was partially insured in the London and Lancashire Insurance Company.

"OPTIMUS" 100 GUINEA PHOTOGRAPHIC COMPETITION, 1893.—Prizes have been awarded to the under-mentioned:—Class I., sub-class A, transposed; B, J. H. Avery and W. Crofton Hemmons. Class II., sub-class A, W. Galloway, J. C. Oliver, J. Wickens. Class III., George Reade (for a set of prints), and Mrs. S. F. Clarke. Class IV., transposed. Class V., sub-class A, Miss E. R. Marcus; B, transposed. Class VI., A. F. Jarvis (for a set of prints), A. T. Bucknall, J. W. Morgan, T. G. Gamlen, R. Laverark (a set of prints). Class VII., J. H. Gear. Class VIII., transposed. Class IX., E. Brightman. In accordance with proviso on entry forms, several prizes have beeh transposed to classes other than those originally named, the Judges deciding such a course was advisable.

BLISTERS ON ALBUMEN PAPER. — The Dresden Albumenising Company write:—"In many Continental photographic societies and journals connected with them the origin of blisters on albumen paper has lately been discussed, and the question raised if there is a preventive besides the two known methods of immersion of the dry print in alcohol before the first washing and of adding ammonia to the fixing bath, which are both effective, but troublesome and expensive remedies. The formation of blisters in albumen paper must, in the first place, be attributed to the demand for high-gloss papers, which, in addition to a double coating, require a much stronger albumen than it was customary to use formerly. This thicker coating not only ensures higher gloss, but also better vigour and detail in the print, whilst at the same time it makes the paper more liable to blister. In order to work even the most brilliant of these highly albumenised papers without blisters, it is quite sufficient to use the very simple old remedy of adding a handful of salt to the first washing water after fixing. This has not only proved effective, and has been adopted by the majority of professional photographers, but has no injurious effect on the tone of the prints. The paper does not always blister, and is particularly free from the defect in summer, when the baths and washing water are nearly the same temperature; but in winter the baths are, as a rule, much warmer than the washing waters, and it is this sudden change from warm to cold that favours the formation of blisters. It is then that the simple salt remedy should never be left out. Amongst professional photographers, albumen paper will hold its own probably for many years to come, for the simple reason that it is easier to manipulate and less liable to injury than gelatine or collodion papers. In most cases operators have only themselves to blame if they lose a batch of prints through blisters, when the salt remedy would have saved loss of time, money, and temper."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 499.—"Improvements in or relating to Photographic Cameras." Communicated by P. S. Marcellus. W. P. THOMPSON.—*Dated January*, 1894.

No. 699.—"An Apparatus for Drying Photographic Plates and Prints and suchlike Articles." F. ILES.—*Dated January*, 1894.

No. 797.—"An Improved Camera-stand." J. H. GREEN and C. E. HENDRICK.—*Dated January*, 1894.

No. 809.—"Improvements in Apparatus for the Separation and Manipulation of Sheets or Cards, especially Applicable to the Separation and Manipulation of Sensitised Surfaces in Photographic Cameras." J. APPLETON.—*Dated January*, 1894.

No. 824.—"An Improved Method of Preparing Pigment Paper for Photographic Printing." Complete specification. W. WHITE.—*Dated January*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 2035.—JOHN GEORGE GOOSEY, 16 Blythe-hill, Catford, Kent. *December* 2, 1893.

THERE are photographic cameras now in use which are so arranged that a series of sensitive plates can be stored in a holder contained within the camera, and simply by rotating this holder by a handle upon an axis, which passes through to the outside of the camera, the plates can in succession be brought into position for exposure, and after exposure can be dropped on to a pile where they can safely remain until taken out to be developed. Such cameras, however, have usually been so contrived as to render it necessary that special photographic plates should be used, the edges of the photographic plates needing to be specially formed or notched to suit the instrument.

It is an inconvenience not to be able to employ the plates commonly to be found in the market, and this inconvenience, by my invention, I avoid.

In my instrument the plate-holder is a frame of rectangular form closed at the bottom and having small blocks or filling pieces in the corners.

The sensitive plates are placed in this frame alternately with pieces of opaque cardboard. The plates are somewhat wider than the cardboards, and the latter are longer than the plates, so that the former extend past the corner blocks widthwise, and the latter lengthwise. The holder is provided on either side with a spring lip, and these lips, so long as they are in place, prevent the plates from falling out of the holder, although they are pressed outwards by an inner bottom with a spring beneath it with which the holder is provided.

On each end of the box there is a slide having two pins upon it which project through slotted holes into the interior of the holder near to the mouth. The outermost of the cardboards retained in the holder rests on the pins. The ends of the cardboards are notched, so that a movement of the slides places the pins in such a position that the cardboards can pass them.

The holder is mounted on trunnions within the camera, and can be turned by means of a handle, which also serves to indicate the position of the holder. When the holder is in a suitable position, the outermost sensitive plate may be exposed in the camera and a picture taken; then, when the camera is closed, the holder, by turning the handle, is rotated through about three right angles. This movement inverts the holder and brings fingers or projections upon or in connexion with the spring lips against cam pieces fixed within the camera; the exposed plate then falls out on to the pile where it is to remain. Then the holder is turned in the reverse direction through an angle less than a right angle; this motion allows the spring lips to close upon the edges of the next plate, and also causes other stationary cam pieces to shift the slides upon the ends of the holder. The pins in the slides are thus bought to coincide with the notches in the uppermost cardboard and this card is then able to fall down out of the holder, and it does so fall and is deposited on the top of the receiving pile. It then only remains to turn the holder back to its original position and the instrument is ready to take another picture.

The claims are: 1. In a photographic camera, a rotating plateholder, adapted to contain a store of rectangular photographic plates, separated the one from the other by cardboards, such plates being retained by lips on opposite sides of the plateholder, whilst the cardboards are retained by pins or projections on the other or remaining sides, and there being also upon the plateholder and the camera parts so arranged that, on the plateholder being rotated, the lips are first withdrawn to allow the plate to fall out, and afterwards, when the lips are again in place, the pins or projections are moved so as to allow the cardboard to pass out. 2. In a photographic camera, a plateholder with corner blocks, and containing a pile of sensitive plates and cardboards, differing in width and length, and kept duly ranged by the corner blocks, and having movable lips on opposite sides, and movable pins or projections on the remaining sides, which operate alternately to allow the escape

of the plates and cardboards one at a time from the plateholder. 3. In a photographic camera, apparatus substantially as herein described and shown, by which a series of plain rectangular plates may in succession be exposed in the focal plane of the lens.

Improvements in or relating to Photo-mechanical Printing.

No. 3964. William Roger André, and Wallace Robert Harrington Sleigh, and Arthur Benson Aide Sleigh, Melrose Electric Light Studio, Bushey, Hertfordshire.—*December* 2, 1893.

Whereas it is the ordinary practice in photo-engraving to use transparent screens, or network of variously distributed lines, for the purpose of obtaining tones on a photo-mechanical block for surface printing.

This invention is for the adaptation of any transparent, or semi-transparent, screens or network of cross lines (horizontal, vertical, or diagonal), or a reversed network of the same, or a screen of single lines, horizontal, vertical, diagonal, circular, oval, waved, or rectangular, or a combination of one, two, or more of these, for the production of an intaglio (bitten) plate, or any metal, stone, glass, or composition, to be printed by the ordinary copper-plate printing method.

By the employment of screens or network of lines as aforesaid, not only the image but the aforesaid lines are represented on the sensitive plates, so that the subject is broken up into lines.

All the rest of the process is effected in the ordinary way.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is, the employment of screens for the production of intaglio plates for photo-mechanical printing, substantially as described.

Improvements in Iris Diaphragms for Photographic Objectives and in Mechanisms for using same as Objective Shutters.

(Communicated by the firm of Carl Zeiss, of Carl Zeiss-strasse, Jena, Grand Duchy of Saxe-Weimar, Germany.)

No. 21,276. James Yate Johnson, 47, Lincoln's-inn-fields, Middlesex. *December* 9, 1893.

This invention relates to iris diaphragms for photographic objectives, and consists in improvements of such diaphragms, and in mechanisms for using the same as objective shutters for time as well as for instantaneous exposures without prejudicing the employment of the iris as a mere diaphragm of adjustable aperture for focussing the object, or for exposures at which a special cover is used as the objective shutter.

For the purpose of allowing absolutely instantaneous exposures and of excluding any interruption of the working, the mechanism of the iris is so arranged that the blades move with the least friction or other resistance, and cannot be deformated or interfere with each other, thus avoiding the defect common to iris diaphragms, that, in rapid closing, the hook-shaped inner ends of the blades strike into each other so as to stop the movement before the aperture is completely covered.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 22	Camera Club	Charing Cross-road, W.C.
,, 22	Lantern Society	20, Hanover-square.
,, 22	North Middlesex	Jubilee House, Hornsey-road, N.
,, 22	Putney	Boys' Gymnasium, Charlwood-road.
,, 22	Richmond	Greyhound Hotel, Richmond.
,, 23	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 23	Great Britain (Technical)	50, Great Russell-st., Bloomsbury.
,, 23	Hackney	206, Mare-street, Hackney.
,, 23	Newcastle-on-Tyne & N. Counties	Central Exchange Art Gallery.
,, 23	Paisley	9, Gauze-street, Paisley.
,, 24	Leytonstone	Assembly Rooms, High-road.
,, 24	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 24	Southport	The Studio, 15, Cambridge-arcade.
,, 24	Stockport	Mechanics' Institute, Stockport.
,, 25	Camera Club	Charing Cross-road, W.C.
,, 25	Glossop Dale	Norfolk-square, Glossop.
,, 25	Halifax Photo. Club	Mechanics' Hall, Halifax.
,, 25	Hull	71, Prospect-street, Hull.
,, 25	Ireland	35, Dawson-street, Dublin.
,, 25	Liverpool Amateur	Percy-buildings, Eberle-street.
,, 25	London and Provincial	Champion Hotel, 15, Aldersgate-st
,, 25	Oldham	The Lyceum, Union-street, Oldham.
,, 26	Cardiff	Castle Arcade, Cardiff.
,, 26	Central Photographic Club	Coleman's Hotel, Henrietta-st., W.C
,, 26	Croydon Microscopical	Public Hall, George-street, Croydon.
,, 26	Holborn	100, High Holborn, London, W.C.
,, 26	Maidstone	"The Palace," Maidstone.
,, 26	Swansea	Tenby Hotel, Swansea.
,, 26	West London	School of Arts and Crafts.
,, 27	Hull	71, Prospect-street, Hull.

PHOTOGRAPHIC CLUB.

January 10,—Mr. Birt Acres in the chair.

A sample of Christie's ruby medium was shown by Mr. Bridge.

The Chairman had found it very satisfactory.

Mr. J. Nesbit asked if it would do for isochromatic plates.

Mr. Bridge replied that it would. He did not find it fade.

Presentation of the volume of the *Practical Photographer* for 1893 was acknowledged, and the thanks of the Club passed to the donors, Messrs. Percy Lund & Co.

Mr. W. E. Halse exhibited Fletcher's Thermo-hydrometer.

Ilford Matt P.O.P.

Mr. John Howson, in introducing the subject, said that the new paper could be worked side by side with the glossy-surface paper. He showed prints of various tones produced in the same bath. No variation of the formulæ was necessary. He pointed out that it was difficult to see the difference between matt and glossy prints in the bath. He advised placing the prints in the first wash water face downwards, and to keep them moving to prevent unequal toning. The matt prints would stand rougher handling than the glossy, and stood heat equally as well or better. The emulsions for the matt and glossy paper were made by the same formulæ, with an addition in the former case for obtaining the matt surface. The alum bath after the first washing was not necessary except in hot weather. When used the alum should be well washed out before toning. The toning bath recommended was—

Ammonium sulphocyanide	30 grains.
Gold chloride	2 ,,
Water	16 ounces.

He advised keeping the sulphocyanide in a solution of known strength. The bath might be used at once with advantage; it was best not to keep it. Replying to Mr. Foxlee, Mr. Howson said he had not detected any difference in action with discoloured samples of the sulphocyanide, but it should be white. An excess of the sulphocyanide gave a liability to partial toning and degradation of the whites. The tone depended on the length of toning, and the finished tone was the same as when the prints were withdrawn from the toning bath. About a grain and a half of gold per sheet were required. The salt bath rather slowed toning. Sepia tones were best got by using a bath with double the quantity of gold to the normal quantity of sulphocyanide, and short, quick toning; but the shorter the toning, the less permanent was the print. The matt paper suited a wider range of negatives than the glossy.

Mr. A. Mackie remarked that in using a weak bath it was easy to tone the high lights without affecting the shadows.

Mr. Howson, proceeding, said that the matt paper being thin it was easier to mount than the glossy, by rubbing down with a wet sponge, oiled paper, or a roller squeegee. Blotting-paper, however, must not be used. Lessening the quantity of sulphocyanide slowed the toning. It was most important to use a pure sample.

Mr. Howson toned and fixed several prints, which were much admired. He also distributed sample packets of the paper.

In reply to Mr. Foxlee, Mr. Howson did not advise the combined bath; he thought it required a chemist to keep it in order. Answering Mr. Wilmer, he said he would not attempt to dry sulphocyanide; he thought it was chemically deteriorated.

Mr. Foxlee had had samples of ammonium sulphocyanide in sealed bottles, which had turned pink. He inquired if the change was likely to be due to light.

Mr. Halse thought it was doubtful.

Mr. Howson would not advise the use of a damp sample.

Mr. Foxlee asked if the matt paper could be toned by other formulæ than the one given.

Mr. Howson had toned successfully in every simple bath recommended, but advised the sulphocyanide. He thought platinum did not give satisfactory tones with gelatine paper.

The Chairman spoke strongly against the use of the combined bath, and was of opinion that brown-toned prints were less permanent than purple-toned. He asked how to get a soft print from a hard negative (for negatives suitable for albumen prints) by modifying the bath, &c.

Mr. Howson replied that gelatine papers were made suitable for most general classes of negatives. There was no means of modifying results.

A vote of thanks was passed to Mr. Howson for his address and demonstration.

MANCHESTER PHOTOGRAPHIC SOCIETY.

January 11,—Mr. T. R. Cobley in the chair.

Messrs. J. C. Wolfenden and James Chapman were elected members of the Society.

Mr. W. I. Chadwick, a former secretary of the Society, gave a lecture, or rather a series of lectures and demonstrations, on *Photo-micrography, Lantern Projection, and the Polariscope.* The members were much interested in Mr. Chadwick's description of the various processes, and accorded him a very hearty vote of thanks. Regret was expressed that business engagements prevent his more frequent appearance among his old friends at the Society's meetings.

Central Photographic Club.—January 11. The large room of the Club was crowded to excess when Mr. F. P. Cembrano, jun., gave his lecture on *Granada and the Alhambra*, Mr. Thomas Bedding presiding.—The lecturer, in his opening remarks, said the work was done early in his photographic career. Six or seven years ago he visited the south of Spain in the months of December and January; the weather was as fine as it is here in May and June. This ground is practically a feast for photographers, but it is no use being in a hurry getting about, travelling being very slow, express trains going about eighteen or twenty miles per hour, and ordinary trains so slow that on one occasion mounted police were sent after the train and caught it up. The lecturer then showed and described several views of the neighbourhood of Granada, and some fine street scenes. It was unusual to see groups of people without donkeys, which was confirmed by the slides shown. There were some striking pictures of the King of the Gipsies and others. The Alhambra was now reached, and a large number of good slides of the interior and exterior were shown, especially some of the Court of Lions. The extent of the palace can be

best estimated by the fact that at one time it had about 6000 inhabitants. Some views of the Palace of Generalife brought the lecture to a close. Mr. Carter then showed two slides of H.M.S. *Victoria*, one taken when the vessel was sinking, just showing the propellers out of the water. Mr. W. Butcher, of Blackheath, showed the following "Primus" novelties:—New combination cylinder key, lantern lecturer signal, registering and centering slide-carrier, and professional spot-binding strips. Fitch's new developing dish for films was also shown.

East London Photographic Society.—Ordinary Meeting, January 9, Mr. John H. Gear (President) in the chair.—Messrs. Taylor & Hobson's system of interchangeable lens fittings was on view, and won admiration from all for its simplicity and neatness. The CHAIRMAN had recently several of his lenses altered in this manner, and found it a distinct saving of time, weight, and temper, and also done away with the cumbrous other fronts necessary for each individual lens. A question from the question box was read: "Is it a practical fact that, by the use of amidol and some other of the new developing agents, the exposure can be considerably shortened?" Mr. GEAR, who had used amidol considerably both for positive and negative work, had found that, when the negative is under-exposed and pyro is used, the shades of gradation were not so good as when amidol was used, and from this fact he deduced that this is what is really meant when it is asserted that amidol allows a shorter exposure than pyro. A simple and workable amidol developer, suitable both for bromide paper and negative-making, was made up as follows:—Stock solution, 1½ ounces sulphite soda dissolved in 20 ounces of water. To develop, take 1 ounce of solution, add 5 grains of amidol, and make up with water to 6 ounces, adding it to 10 minims of a ten per cent. solution of bromide potassium, as required. The third annual dinner and presentation of awards will be held at the "City Arms Restaurant," 2, St. Mary-axe, E.C., on Monday, January 29.

Hackney Photographic Society.—January 9, Mr. E. Puttock in the chair.—Two new members were elected. Work was shown by Messrs. Gosling, Dean, and Guest. In reply to a question, it was stated that the strength of a saturated solution of hypo was about forty per cent. A pint of saturated solution contains about eight ounces of hypo. Mr. S. H. BARTON then read a very interesting paper on *Cloud Printing*, and illustrated his remarks with examples of his own work. In a landscape photograph, when clouds are included in the view taken, it will generally be found on developing that the sky portion of the negative will rush up and become over-dense long before the rest of the negative has been sufficiently developed. Mr. Barton said that this difficulty might be overcome by using a developer weak in pyro, this having the effect of restraining density until detail was fully out. In taking cloud negatives, clearness and softness should be the aim, mistakes being often made in making them too hard. Isochromatic plates were best for clouds. When no suitable clouds were available, prints were often improved by sunning down the blank sky space. In making lantern slides, Mr. Barton used a lantern plate for the cover glass, and printed the clouds thereon. This was done by using the finished lantern slide as a mask, and with a cloud negative in the reducing camera, printing suitable clouds through it on to the cover glass. Any dark parts of the sky showing through the high lights of the landscape, &c., could be removed by applying locally solution of potassium ferricyanide and hypo. In the discussion which followed, Mr. R. BECKETT said that, hitherto, sufficient attention had not been paid to clouds in photography. In selecting cloud negatives, the question as to their character and suitability should be regarded. They often either made or marred a picture. It was a good plan, in photographing a landscape where suitable clouds were present, to expose two plates on the same subject, one with normal exposure for the landscape, and the other with less exposure for the clouds. A long discussion on exhibition matters concluded the business of the meeting.

North Middlesex Photographic Society.—The Annual General Meeting of this Society was held on the 8th inst., when a very encouraging and favourable report was presented by the President. He announced that, notwithstanding the increased competition around, this Society had not only held its own, but had materially increased its strength, the number of active paying members being eighty-four. The balance in hand was more than three times that carried over from the previous year, so that there could be no question as to the solvency of the Society. The Technical Instruction Evenings had proved most valuable and interesting, and a further series of meetings of a similar kind would be held during the present season. The election of officers for the present year is as follows:—*President* (fourth time): Mr. J. W. Marchant. *Vice-Presidents:* Messrs. Charles Beadle and S. E. Wall. *Council:* Messrs. Avery, Golding, Goodwin, Gregory, Gill, McIntosh, Mummery, Mattocks, Pither, Treadway, Walker, and Wall. *Curator:* Mr. W. H. Langton. *Hon. Treasurer:* Mr. Henry Smith. *Hon. Secretary:* Mr. George Gosling, 13, Lausanne-road, Hornsey, N., of whom any further information can be obtained. Meetings are held on second, third, and fourth Mondays in each month, when visitors are always welcome.

West London Photographic Society.—January 9.—Mr. F. W. Hindley showed a most interesting series of lantern slides from negatives taken by himself in some of the less-frequented districts of the west of Ireland, and gave an entertaining account of the incidents of his sojourn in that country, with much instructive information about the customs and character of the inhabitants, under the title of *Irish Life and Scenes*. In reply to a member, he intimated that the photographs had been taken on films in a Facile hand camera.

Woolwich Photographic Society.—January 11, Colonel D. Davies in the chair.—Mr. Birt Acres, representing Messrs. Elliott & Son, demonstrated the *Carbon Process*, briefly giving a description of the materials used and apparatus required. The rest of the evening was taken up in practical work. Mr. Birt Acres went through the whole process by single and double transfer, and it seemed a pleasure to him to go through the work, in the course of which he gave many useful and valuable tips that would never be learned by merely reading up the subject. The results are so beautiful and the methods seemingly simple, that it is a wonder that the process is not even more popular than it is; but, as Mr. Birt Acres pointed out, there is no doubt that carbon work is making considerable headway amongst those who strive for artistic effects, as shown by the great number of pictures hung at the best photographic exhibitions. Mr. H. J. DALBY afterwards addressed the meeting, testifying as an every-day worker in the process the great value of the demonstration to all those intending to take up the method, and moved that the thanks of the Society be accorded to Mr. Birt Acres.

Birmingham Photographic Society.—January 9, Annual Meeting. Sir J. B. Stone, J.P., F.L.S., F.G.S., presided, and there was a large attendance.—The ninth annual report of the Council stated that the status and usefulness of the Society had been well maintained. The attendance at the various meetings had been rather above the average, and a wider interest had been taken amongst the general members in the subjects discussed. Several highly interesting and instructive papers had been read by members of the Society, and the Council felt a real pleasure in expressing their indebtedness to those gentlemen, not only for the ready good-will with which they took upon themselves much hard work, but also for the ability with which they handled the subjects dealt with. The finances of the Society continued in the same healthy condition to which they were brought during the preceding year. The number of new members enrolled during the year was twenty-nine, the largest number (if they excepted 1892, when thirty-four members were added to the list) ever elected before in one year. The subject of a more commodious club-room had been frequently discussed, and it was proposed to take steps in the near future to secure rooms which will at once be more convenient and suitable to the growing needs of the Society. The annual Exhibition was in no way behind its predecessors with regard to the general excellence of the exhibits, and financially it had been the most successful which had hitherto been held. The Survey Section reported that the members had done good work during the year. Photographs to the number of 517 had been handed in to the Survey Council, and, after exhibition in the Art Gallery, were presented to the city, to be preserved in the reference library for public use. Owing to the unusually fine season of 1893, a larger number of excursions were arranged during the past year than in any previous year. Financially, the Society had maintained the satisfactory position it had acquired in 1892. The receipts had been 141*l.* 5*s.* 10*d.*, and there was a balance in hand of 50*l.* 17*s.* The PRESIDENT delivered an address, in which he referred to the objects and duties of the Society, and the advantages it afforded to its members by the interchange of opinions, and the emulation which their work should create. He claimed for exhibitions that they did a good work in that direction, and alluded to the last Exhibition of the Society in illustration of their special educational value. He urged that new members and those of less than average ability should be encouraged also to exhibit samples of their work, with the object of their own self-improvement by comparison, whilst, on the other hand, they should receive encouragement and consideration from workers of greater knowledge and experience. The President also expressed his opinion that the Society should have a wider sphere of action considered in the light of its public duties. He recommended the giving of popular lectures by the aid of the lantern, thus demonstrating the value of photography in this respect; and he reminded members of their duty in educating the public by the aid of their art. He expressed his satisfaction at the valuable work that was being done by the Photographic Survey, and referred to the formal resolution of the Birmingham City Council and the numerous private letters of congratulation as evidences of the fact that the Society's efforts in this respect were highly appreciated by their native town, adding that those evidences of appreciation should induce further efforts, which would operate still more to the good of the city and the credit of the Birmingham Society. He was hopeful that, judging by the letters received from all parts of the country for advice in survey work, the Society had set an example which would be the means of ultimately creating a national photographic survey. An animated discussion ensued upon various matters affecting the Society's interests, after which the following officere were elected:—*President:* Sir J. B. Stone.—*Vice-Presidents:* Messrs. G. F. Lyndon, J.P., W. Jones, J. H. Pickard, and E. C. Middleton.—*Council:* Messrs. Thomason, T. Taylor, Leeson, Underwood, Winn, Hart, Wilson Browne, and Wilkes.—*Librarian:* W. S. Horton.—*Treasurer:* W. Rooke.—*Hon. Secretary:* C. J. Fowler.—*Assistant Hon. Secretary:* T. W. Robinson. Votes of thanks concluded the meeting. The PRESIDENT, in responding, referred to the special value of photography for scientific and historical purposes, adding that in all branches of science the necessity of photography was universally conceded as a means of conveying knowledge by exact representation.

Cardiff Photographic Society.—January 11, Mr. S. W. Allen in he chair.—Mr. S. Herbert Fry gave a demonstration on *Paget Matt Printing-Out Paper*, and submitted a large number of very fine prints on both matt and glossy surfaces. After some preliminary remarks, he proceeded to manipulate some under-printed proofs of varying depth, laying special stress upon the necessity of well bromising the prints, stating that, to be certain of the results, they should be allowed to remain in the bromide bath for twenty minutes. Two minutes, as given in the Paget Company's working instructions, would be sufficient for moderately under-printed proofs, but where the prints were very much underdone the longer time was necessary. After leaving this bath, the prints are developed to a uniform depth and well washed to get rid of the developer, as, unless this is thoroughly removed, it acts as an intensifier in the toning bath. Mr. Fry used the combined toning and fixing bath, to which prepared chalk was added to absorb the free acid contained in the paper, and to keep the bath neutral. The best results are got by using a fresh toning bath for each batch of prints. A number of slides on Paget plates were passed through the lantern, the tones varying from black to red, the warmth of tone depending upon a lengthened exposure and the addition of carbonate of ammonia to the developer. The print-out slides were remarkable for the translucency of the shadows. A vote of thanks to the lecturer brought a most interesting meeting to a close.

JANUARY 12.—Some discussion arose as to forming a photographic section at the proposed Fine Art and Industrial Exhibition to be held in Cardiff during the year, and it was decided to communicate with the Exhibition Committee upon the subject.

Derby Photographic Society.—The Annual Dinner of this Society was held on January 9, at Smith's Restaurant, in Victoria-street, among those present being Messrs. W. Morley, T. Scotton, T. A. Scotton, F. Ford, J. A. Panton, J. W. Smith, A. Smith, W. Morris, C. Bourdin, G. Cornwell, G. Walker, G. Riste, R. Orme, J. Barlow, C. J. Bennett, F. Anker, A. Scotton, F. Carter, G. H. Grundy, R. Watkin, W. H. Glen, and A. W. Sone. After an excellent dinner, Mr. Morley was voted to the chair, and Mr. Cornwell to the vice-chair, and the toast-list was then proceeded with. The CHAIRMAN having given the loyal toasts, Mr. G. Walker proposed "The Derbyshire Photographic Society," and wished it every success. Mr. T. SCOTTON, in responding, referred to the fact that the Society was formed in 1884, when eight gentlemen interested in the profession assembled in a room in the Rodney-yard, and thoroughly discussed the advisability of launching a Society. That was done, and they now had seventy-three members, which, he thought, was very successful. They had one of the cleverest, if not the cleverest, experts in photography as their President, namely, Captain Abney, and a very practical man in Mr. Keene as a supporter. Mr. SMITH proposed "The Visitors," of whom, he said, there were a good number present, and who were always welcome. Mr. A. SCOTTON replied, and said that he yielded to no one in his admiration of a beautiful picture. The art was a noble one, and an agency wherewith to develop the artistic tastes of the people, and, consequently, apart from its commercial aspect, it deserved encouragement. Mr. GRUNDY suitably proposed "The Chairman," who, in responding, said that, though he had no knowledge of the technicalities of the art, it was one in which he was deeply interested, and one which he would support to the best of his ability. Mr. CARTER gave "The Vice-Chairman," and Mr. CORNWELL suitably responded. This concluded the toast-list, and an harmonious evening was then spent. Some excellent songs were sung, and Mr. Scotton contributed a very clever reading, which was heartily enjoyed. Mr. T. H. Bennett, F.C.O., ably presided at the piano.

Exeter Amateur Photographic Society.—January 10.—Address by Mr. Herbert Fry on the merits of the *Paget Prize Papers and Lantern Plates.* A large number of prints on glossy and matt-surface paper were shown, from which the members were able to judge the capabilities of both. After giving very clear instructions as to the process of developing partially printed pictures, Mr. Fry proceeded to develop and tone two in different stages of printing, the results being exceedingly good. Three sets of lantern slides were shown on the screen, the first being made by contact, and developed with hydroquinone and carbonate of ammonia. A dozen slides of the same subject were shown, to illustrate the variety of tones that could be obtained in this way. The second set was made by reduction, and developed with pyro. The third consisted of print-out slides, the various colours, from warm to cold, being obtained by gold toning. After the address, which was very carefully followed, numerous questions were asked as to difficulties that had been experienced by some; formulæ for toning, &c., were given, and the meeting terminated with a cordial vote of thanks to Mr. Fry for his remarks.

Leicester and Leicestershire Photographic Society.—January 11.—The Treasurer's report was read by the President (Mr. J. Porritt), showing a balance of over 7*l.* to the credit of the Society, and the Secretary's report was read by the Hon. Secretary. After a vote of thanks to the retiring President, proposed by Mr. George Bankart and seconded by Mr. S. S. Partridge, the following officers were elected for 1894:—*President:* Mr. J. Porritt (re-elected).—*Vice-President:* Mr. Joliffe.—*Committee:* Messrs. Bankart, Partridge, Toone, Hubbard, and Cowdell.—*Treasurer:* Mr. J. Toone.—*Hon. Secretary:* Mr. H. Pickering,

Stereoscopic Club.—December 8, 1893.—Mr. M. W. THOMPSTONE read a very practical paper, and gave a demonstration in carbon printing, or the Autotype process, for he preferred the Autotype Company's tissues, &c., to any other make, and this after some considerable experience. After dealing with the early history of the carbon process, he plunged into practical details, showing carbon prints in various colours alongside with platinotype, albumen, gelatino-chloride, and bromide prints from the same negatives. The prints, which he developed in simply plain hot water, had been exposed during the day for about a third of the time that would have been necessary for silver paper. They were all of one tone, and simply beautiful, as were the finished pictures and opals exhibited by Mr. Thompstone. Many of the members were astonished at the simplicity of the process, and intended to adopt it. The HON. SECRETARY (W. I. Chadwick) then gave a demonstration of *Nikko Paper Printing*,. He said the process was so simple that it reminded him of a man who came to a bookseller friend of his for a treatise on the mixing of plaster of Paris. "There is no treatise on the subject, and no need for one," said the bookseller; "all you have to do is to put some water to it and stir it up." It was nearly the same with Nikko paper; all you have to do is to expose it develop in metol, then fix and wash. It is a bromide paper with a fine surface, very suitable for small prints. He had never been in favour of ordinary bromide printing for small contact printing until Nikko came on the scene. The makers gave ferrous-oxalate as the developer, but that required a clearing bath, and metol did not, and as he had never seen any ferrous-oxalate developed prints superior to those developed by Nikko, he preferred the simpler process. It was quite easy to make a dozen or more prints from one negative in an hour by an ordinary gaslight.

Dundee and East of Scotland Photographic Association.—January 11.—Mr. John Thow delivered a lecture upon *A Trip to the Netherlands with Cycle and Camera.* Starting from Leith, the lecturer described, in a humorous and entertaining fashion, a tour in Holland and Belgium, passing through Rotterdam, Delft, The Hague, Dordrecht, Antwerp, and Brussels. The beauties, architectural and otherwise, of the towns and cities were finely illustrated by a beautiful set of instantaneous photographs taken with a snap-shot camera by the lecturer himself. At the close he was awarded a vote of thanks. Slides were thereafter passed over the screen by Mr. David Ireland and Mr. Cox. The prize offered for three harvest studies was awarded to Mrs. Norrie, Broughty Ferry.

Glasgow and West of Scotland Amateur Photographic Association.—January 15, Annual Meeting.—Three new members were elected. The annual report and financial statement showed that the Association is in a prosperous condition, having a balance of 92*l.* to the good and furniture and apparatus valued at 200*l.* Office-bearers for 1894 were elected as follows:—*President:* Mr. Stewart Smith.—*Vice-President:* Mr. A. Lindsay Miller.—*Council:* Messrs. W. J. B. Halley, Archibald Watson, V. L. Alexander, Andrew Brown, R. F. Linn, and William Miller.—*Librarian:* Mr. N. G. Reid.—*Treasurer:* Mr. J. Robertson Miller.—*Secretaries:* Messrs. William Goodwin and J. C. Oliver. Mr. P. Falconer gave a practical demonstration of the wet-collodion process, making a successful negative from a plaster bust illuminated by magnesium light. A large number of lantern slides by members were shown on the screen, including the slides which competed at the recent exhibition of members' work.

Photographic Society of Japan—December 8, 1893.—Mr. Kajima Seibei showed a panoramic camera for working films 45×16 inches, and including an angle of about 120 degrees. The principle of the camera is as follows:—The film is placed in a flexible dark slide that can be bent into a circular form constituting about one-third of a complete cylinder. The lens can be revolved on a vertical spindle, the axis of which passes through the optical axis of the lens. The light is allowed to reach the film only through a narrow slit close to the film, this slit being at the end of a tapered box, fixed to the same front as the lens, and revolving with it. The camera is by Scovill, Adams, & Co., and is a very handsome and substantial piece of work. An ingenious arrangement for photographing from a captive balloon was shown by Mr. K. Ogura, of the Photographic Laboratory of the General Army and Navy Staff. The camera is suspended on gimbals on a frame so arranged that the ground glass will remain either in a vertical or a horizontal plane, or in a plane at any intermediate angle, as desired. The exposure can be made by an ingenious electrical arrangement. Two prints from the same negative were shown by Messrs. W. K. Burton and K. Arito. In one far too great an expanse of nearly white sea appears between the foreground and the middle distance; in the second the distance is reduced and the sky is added to, with the effect that the picture is greatly improved. The effect is got by double printing. Mr. W. K. Burton presented the Society, in the name of the Duke of Newcastle, with several bottles of Messrs. Burrough, Welcome, & Co.'s photographic "Tabloids." These are small discs, or "tabloids," of compressed photographic chemicals, of exact weight. Both Mr. Burton and Mr. K. Arito could testify to the extremely good results that could be got with these tabloids. They are likely to be of the greatest use to photographers, either amateur or professional, whilst travelling. Some excellent results of the balloon camera already mentioned were shown by Mr. K. Ogura; also a very beautiful collotype, 16×10 inches on paper 26×18 inches, from his own negative, by Mr. I. Tanaka.

FORTHCOMING EXHIBITIONS.

1894.	
January 19–22.....	*Bristol Triennial International Academy of Arts, Bristol. Hon. Secretary, F. Bligh Bond, 36, Corn-street, Bristol.
——	*Exeter Amateur Photographic Society. Hon. Secretary, John Sparshalt, Fairfield House, Alphington-road, Exeter.
,, 19–29.....	*Photographic Society of Ireland. Hon. Secretary, J. A. C. Ruthven, 35, Dawson-street, Dublin.
February 6	Durham Camera Club. Hon. Secretary, R. Hauxwell, The Avenue, Durham.
,, 8–10	Woolwich Photographic Society. Hon. Secretary, W. Dawes, 145, Chestnut-road, Plumstead, S.E.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

* Signifies that there are open classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COMPRESSED GAS CYLINDERS.

To the EDITOR.

SIR,—Mr. W. Morton Jackson, manager to the Manchester Oxygen Company, has at last attempted to reply to my letter, published in your issue of December 1, but his effort is not a straight reply to my letter at all.

Mr. Jackson considers the whole tone of my letter as "implying censure upon the compression companies." If there is any censure conveyed in my communication, to whom should it apply but to those who supply the thing in question? It is no use to censure dry-plate makers or others who have nothing to do with the subject.

When I stated my opinion "that we may expect these explosions more frequently from now," I also added, "unless something is done to prevent them."

I likewise gave, as a reason, that there were hundreds of cylinders in use which were not so good as they were originally, because they have

deteriorated by constant use. I have always been willing to admit that a cylinder "properly made, tested, and annealed," is better than one that is not so, and the public want a guarantee that they are "properly made, tested, and annealed." Mr. Jackson's Company have given proof that they can charge a defective cylinder by charging the one which exploded at Bradford. But Mr. Jackson fences only with my statements of irregularities by his Company, as shown by his remarks that "he cannot think they are such as I indicate." As the Manager of the Company, he ought to be in a position to refute my assertions, and I sympathise with him not being able to do so.

Replying to my statement about the overcharging of cylinders, Mr. Jackson says this is "to allow liberally for cooling." In my own commercial practice, charged cylinders may be in store for days, or sometimes a week or two, before they are required, but we always test the pressure before delivery to our customers. Sometimes we find that, by the valve or the gland not being properly closed, the whole or part of the gas has escaped; on the other hand, it is not unusual to find, as previously stated, a pressure of 135 and even 140 atmospheres, and this after having been charged several days. But I am not the only dealer in oxygen and coal gas with this experience—a railway journey from Manchester to Yorkshire or other distant places, surely gives plenty of time for "cooling." I simply mentioned this overcharging of cylinders as one of the irregularities that exist at the present time, and which Mr. Jackson has admitted by his attempt to give a reason for it.

Mr. Jackson calls my mention of the interchangeable adapters "sensational." It would have been better for him if he could have said it was not true. I have shown these interchangeable adapters to the chief engineer of the Manchester Steam-users' Association and other engineers and experts, and shall be pleased to show them to anybody else who takes an interest in the matter. As I have already said, the object of making the coal-gas connexions different from those of the oxygen cylinders was to make it difficult or impossible to charge a wrong cylinder; but, as soon as the alterations were made, the Company began to offer the very thing that made it quite easy, and which ought not to exist, and I asked the question why were these adapters made, or why their own workman should carry one in his pocket as "a very convenient little thing?" It is all very well for Mr. Jackson to tell us what their workmen *would* or *would not* do, but the public want assurance of what the workman *can* or *cannot* do; and when we know of such cases as the following, there is not much room left for confidence.

A friend of mine ordered a new cylinder from a certain firm. On its arrival he noticed a bulge in one place, manifestly a weak place. He therefore returned it as a defective cylinder, and requested a perfect one, but the vendors simply filed the bulge away and redelivered it.

I can assure Mr. Jackson and everybody else that I am prompted by no other motives than the safety of the public. I shall be very glad to see confidence restored, and will do all I can to help to re-establish it as soon as I am in a position to do so. As a manufacturer of lanterns and limelight appliances my business has not been improved by this want of confidence, but business or no business I will never be a party to cloaking a thing which I believe to be defective. Let me assure Mr. Jackson that I have read the report and articles to which he calls my attention. I have also had cylinders cut into sections and tested on my own account, and I am confirmed in my opinion that the only safeguard to the public is Government supervision, and why should we not have Government supervision? If it added a shilling or half-a-crown to the price of a cylinder, what reasonable man would object to that? If it increased the price of compressed gas by the fraction of a penny per foot, what of that compared with the security? In talking over this matter with a prominent M.P., I was assured that Government supervision would not be difficult to obtain if the public demand it.

The railway companies have passed a vote of censure on the present system of compressed gas in cylinders by refusing to carry cylinders, packed or unpacked, by any passenger train, and it is quite time that something was done, one way or the other, to improve the present state of affairs, and I should be glad to see expressions of opinion from others than those commercially interested.

If the subject could be brought forward at every photographic society in Great Britain, a vote passed either of confidence or of censure on the present system of supply, it would at any rate be making a move.

W. I. Chadwick.

P.S.—During the past few weeks I have received some scores of letters from various parts of the country, asking my advice on the use of gas cylinders. The best advice I can offer in the existing circumstances is to reduce the pressure; take, say, fifteen feet in a twenty-foot cylinder.

W. I. C.

GAS CYLINDERS.

To the Editor.

Sir,—In your issue of last week I notice the complaint of a correspondent to the effect that, on sending his own gas cylinder to be filled, the Compressing Company have not returned the same cylinder.

For some years past I have had my gas from Brin's Oxygen Company, in my own cylinders, and have never yet had any but my own returned to me, *but* I have followed the suggestion of that Company, and have had my initials and the name of my town *painted* on them. I should recommend your correspondent to go and do likewise, as his trouble in this direction will very likely become a thing of the past.—I am, yours, &c., Vectis.

January 6, 1894.

THE ACTION OF METOL ON THE SKIN.

To the Editor.

Sir,—Will you kindly allow me space for a few words on this subject in reply to the letter from Mr. J. A. Sinclair in your last issue?

It will, no doubt, be conceded that I have had probably as much experience in the use of metol-Hauff as any one, and I am quite unable to agree with your correspondent as to its injurious action.

It is, of course, quite true that some people have suffered from a form of skin trouble after using metol *and an alkaline carbonate*, but I venture to think that there has not been so far any evidence that this trouble has been *caused* by metol.

In my own experience the difficulty complained of is undoubtedly an eczematous eruption, which would possibly be aggravated by constant dabbling in almost any chemical solution, or even in plain water, at this time of the year. Some months ago I suffered very severely from this form of skin disease—my hands were far worse than any other case which has come under my notice; but, strange to say, I had not at that time touched metol, and my hands, with a gradual recovery of general health, have become all right, in spite of the fact that I have been every day, for many hours, in constant contact with the metol solution.

In conclusion, lest it might be thought that I am holding a brief for Messrs. Fuerst Brothers, you will perhaps allow me to say that, as my connexion with the firm terminated some weeks since, I am only stating my personal opinion and experience.—I am, yours, &c.,

January 16, 1894. L. E. Morgan.

A REMEDY FOR OVER-EXPOSURE.

To the Editor.

Sir,—Reading Mr. Matthew Wilson's communication in the current Journal on "A Remedy for Over-exposure," I was much disappointed to find that it had no reference to over-exposure as ascertained by results, but to anticipated over-exposure only. It may be—probably is—owing to my density, but it did seem to me that prevention in this case is better than cure, and that the best course would be not to over-expose. If a photographer believes that he has exposed correctly he does not expect over-exposure, and cannot use the remedy, as he does not find out the disease until the time for using Mr. Wilson's cure has passed. In ordinary practice of outdoor work the matter generally takes the following course:—A. B. or C., or even D., goes out for the purpose of photographing (more or less) the views of interest in a particular locality, and takes with him for his day's work as many plates of known average quality as he thinks he may need. One after another during the day they are exposed at varying times of the day, in ever-varying conditions of light, and on different classes of view. To each exposure he brings his best judgment, giving such time as he considers the most suitable for each subject, according to its nature and the light available, as well as the lens and stop employed. Returning, he proceeds to development. No one negative, under the circumstances, can be much of a guide to the others, and believing he has exposed correctly he goes ahead. Perhaps the negatives are all successful; perhaps, and not unfrequently, some are over-, some under-exposed, but he cannot tell till he tries each one; and the man who comes home and then says, "I believe I have over-exposed all my views to-day," and then proceeds, in mistrust of the judgment formed at the time and on the spot, to doctor his plates with chlorine water, or anything else, without trying them deserves, in my opinion, to spoil the lot.

If anybody will tell your readers anything new in the way of correcting serious errors of exposure, *when discovered*, he will earn the gratitude of a good many, and of none more than of A. Thickhead.

THE SPEED OF PLATES: A CRITICISM AND A REPLY.

To the Editor.

Sir,—I am very glad to see Messrs. Hurter & Driffield's more reasonable letter in your last issue, although I have to regret that they are even yet unable to refrain from making unworthy innuendoes. I am, however,

willing to take the kindlier view, and I heartily accept their apology and assume that any lack of heartiness on their part is unintentional.

The point that Messrs. Hurter & Driffield have taken up from my paper is certainly a somewhat difficult one, and it is possible that I did not make my meaning sufficiently clear. I certainly imagined that I had said enough to explain my point of view to any one who carefully followed the argument, but I will try to make my meaning clearer.

In the first place, Messrs. Hurter & Driffield say that I "offer no proof" that Abney's range of transparencies is practically more useful than theirs, and that theirs is practically useless to a photographer. Well, it may be a matter of opinion whether I did offer proof or not, but I think that most people who read my paper will agree with me in thinking that I offered quite sufficient. They then attack me on a footnote to the paper, and accuse me of making a mathematical blunder therein. It is remarkable that, with all the paper to criticise, Messrs. Hurter & Driffield select a footnote, containing the only piece of symbolic argument that I used, to reply to. Still, let that pass! I fear that the point that I did not make sufficiently clear to them is that their definition of a perfect negative interpreted absolutely literally is incorrect, but that with an interpretation which I suggested, and which leads to a modification in the mathematical expression of the definition, it is correct, at least apart from the considerations of contrast which I discuss in my paper. This interpretation depends on the fact that the effective printing transparency of a negative cannot be measured from the same origin as the actual visual transparency; thus, the "printing value," as I have called it, is of the nature of a difference, and I have suggested that it is properly measured by the differential coefficient $\frac{dT}{dI}$; and I fully agree that if through any range the relation $T=\frac{a}{I}$ holds, then through that range the printing value will be proportional to

$$\frac{dT}{dI} = -\frac{a}{I^2}$$

only then the negative will not approach to a true representation, and will not be a perfect one.

As Messrs. Hurter & Driffield point out, their second definition of a perfect negative does not coincide with their first one unless μ, the so-called "development factor," is unity—that is, except in a very special case not likely to be often realised in practice. Perhaps this throws a little light on their extraordinary dictum that no one ought to use any developer but ferrous oxalate!

It is unfortunate that there should be a serious misprint in equation (2) of Messrs. Hurter & Driffield's letter. This should read—

$$\frac{dT}{dI} = -\frac{a}{I^{1+\mu}}$$

And then their statements with regard to it are formally correct. My point, however, is this, that it is Messrs. Hurter & Driffield who, in translating their somewhat loosely worded definition into symbols, have blundered, and not I.

Put in a nutshell, the argument runs thus:—The printing value of a perfect negative must be entirely proportional to the exposure. This printing value is represented by the differential $\frac{dT}{dI}$.

Hence $\frac{dT}{dI} = -\frac{B}{I}$, when B is same constant.

This may be transformed into—

$$\frac{dI}{d(\log I)} = -B,$$

which being integrated gives—

$$T = A - B \log I, \text{ when A is also a constant.}$$

In the neighbourhood of Abney's point of inflexion this relation holds. Hence, for transparencies such as are used in Abney's method, the definition of a perfect negative is approximately satisfied.

Messrs. Hurter & Driffield then proceed to quote from Captain Abney's practical instructions for making use of his method. May I in reply refer them to a sentence of their own (*Photo-Chem. Investigations*, p. 13)? "In order to ensure *at least two exposures* falling within the period," &c. The italics are mine, and I do not think they would allow any one to base an argument as to the range which their method covers on this; neither is it fair for them to do so on the parallel sentence in Abney's paper. I regret very much that they have seen fit to repeat their absurd statement that Captain Abney tried to prove that a parabola does not differ much from a straight line. I completely disposed of this in my last letter, and I can only refer to that and to my paper for the demonstration that it is absolutely untrue.—I am, yours, &c.,

Camera Club, January 15. HENRY M. ELDER.

THE WOOLWICH EXHIBITION.

To the EDITOR.

SIR,—The "Woolwich Polytechnic Photographic Society," acting on the suggestion of one of its officers, have decided to add a new feature at their Second Annual Exhibition, to be held on February 8, 9, and 10, 1894. They intend awarding an additional bronze medal to the competitor whose picture, in the opinion of the public, is the best exhibited (apart and independent of all judges' awards).

All admission tickets will be perforated across the centre; one half being reserved for the holder to fill in the catalogue number and the title of the picture considered best—this half to be dropped in a box provided for the purpose, which will not be opened till the close of the Exhibition. The result of this voting will be published in all photographic papers.—I am, yours, &c., W. DAWES, *Hon. Sec.*

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—No one will welcome the formation of a Copyright Union more than I. Perhaps the following suggestion may deserve consideration.

That the blocks reproduced from copyright photographs be handed over to the copyright owner, free of charge, within a month after publication of the journal in which they have appeared.

In my own case I consented to allow a certain journal to reproduce a copyright photograph, the consideration being that my name and address should appear underneath the reproduction. In about a year after, another journal thought fit to publish a portrait of the same gentleman, and with an eye to economy purchased the *identical* block and printed it in their paper—acknowledging underneath the source from whence they obtained it. "Reprinted from —— *Journal*."—my name not appearing.

As the blocks are only used in the one issue, they are practically of no use to the publishers.—I am, yours, &c. J. W. BEAUFORT.

25, *Colmore-row, Birmingham, January* 12, 1894.

COLOURS ON THE SCREEN.

To the EDITOR.

SIR,—The method of making separate positives in composite heliochromy, and then mounting them in register in a wooden frame, claimed by Mr. Gray (p. 26) as a recent improvement of his own, is precisely that which I demonstrated in Philadelphia in February, 1888. This methed had already been so far improved upon when I first showed the results in New York, that the pictures were automatically registered by the camera that made them, and the difficulty experienced at a single demonstration was, *as stated at the time*, due to an accident to the lantern during its transit from Philadelphia to New York.—I am, yours, &c. F. E. IVES.

116, *Charing Cross-road, W.C. London, January* 15, 1894.

FOGGED NEGATIVES.

To the EDITOR.

SIR,—I wish to thank you for the first article in last week's paper (they are all worthy of that), but this one brought to my mind a similar experience last summer.

In company with a friend, one bright morning, I started out for some pictures, partly on business, and for one or two for our album. At night I found three of them, as I concluded, over-exposed, although I had been, as I thought, very careful with the time, no amount of doctoring would bring them right. I well remember how very bright the sky was in front of me, and at the time wished I had my Ross doublet lens, with a sky shade, at hand, but that was at home. I have no doubt, now you have pointed it out, but that was the cause of the flat, foggy appearance, unlike over-exposure. Oh, how we laboured to remove some heavy agricultural implements to better the picture; the heat and perspiration was a thing never to be forgotten.

I went again the next morning to repeat the operation, but the farmer had removed a hay-stack, and otherwise mutilated the scene. I went to the second, a house, etc., there some of the people were gone. At the third, the sky became clouded, so these three were similar in fate to that good second negative you wrote about, I have had like mishaps to my sorrow.—I am, yours, &c., WM. GIRLING.

Stradbroke, Suffolk, January 15, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange couch-end chair, balcony, or ornamental gas stove, for leather Gladstone bag or case to hold whole-plate set.—Address, J. JACKSON, 7, Trafalgar-street, Coventry.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

H. GATZALE-DAVIS.—Received.

G. SLAYMAKER.—The apparatus is Nievsky's, and may be obtained, we believe of Mr. Fallowfield, Charing Cross-road, W.C.

PROFESSIONAL.—Try equal parts by weight of magnesium and chlorate; powder the chlorate thoroughly, and mix by shaking in a bag.

FRED. SMITH.—The conduct of the professed enlarger is extraordinary. We shall endeavour to ascertain more about the matter.

WALTER RIDLER.—Your proposal is quite a feasible one. For ourselves we like it on a larger scale, but yours will certainly answer.

R. A. Co.—Consult the advertisement columns; several makers advertise. It is against our rule to recommend any particular manufacturer.

R. WOOD.—If the carbon picture was developed on the usual single transfer paper, we know of no means of successfully transferring it to a porcelain plaque.

A. N.—The stain on the gelatino-chloride print is clearly due to carelessness in the manipulation. It was not kept moving while in the fixing solution. Probably two prints stuck together.

F. F. WEEKS.—1. You cannot copyright reproductions of old engravings. 2. Read Mr. J. J. Elliott's "Few Facts relating to Photographic Copyright" in the last number of the JOURNAL.

F. J.—1. Grubb's Optical Works, Dublin, will be sufficient address. 2. Why not have a reversing mirror made? 3. By waiting a little longer you will find particulars given in this JOURNAL.

NOVICE.—1. All the firms named make excellent lenses. 2. No advantage except rapidity. 3. Five and a half inches. 4. It depends upon the focal length of the lens, and the particular employed.

B. A. W.—Your experience with one holding a certificate of proficiency is by no means exceptional. The experience gained in the lecture-room does not always turn out to be what is required in actual practice in the studio.

A. WOULD BE.—The apparatus referred to is full value for the money; but, of course, it must not be compared with that costing three or four times the amount. If price is an object, we cannot recommend anything better for the sum stated.

F. DAY.—Of course, if a lens of long focus is used, the resulting photograph will be telescopic. Mr. A. Levy is a thoroughly experienced photographer, and knows what he writes about. Study the subject and write again; we shall always be glad to hear from you.

W. P.—Please repeat your query. Doubtless the first letter miscarried, as we have no recollection of having received it.

T. STUART.—If the employer has become bankrupt, it will be of no use suing him in the County Court for the three weeks' wages. They will, however, be paid in full when the affairs are arranged. It would be a waste of money to do as proposed, as it would lead to no result.

A. SIMPKIN.—Corrosive sublimate and bichloride of mercury are one and the same thing, consequently it would be quite as illegal for an unqualified person to sell it under the one name as under the other. The Poisons Act takes no note of the requirements of photographer.

LEEDS.—It does not follow, because a certain formula is recommended with that brand of paper, that it will tone with no other bath. We have little doubt that any of the other recognised toning baths will answer quite as well, say the acetate for example. Try it, as you are familiar with its use.

C. C. C.—Unless the negative is thoroughly freed from the hyposulphite of soda, varnish is not a sufficient protection against continued contact with even slightly damp silver paper, and that is the source of trouble in your case. The varnish that has been used we know to be good if applied to a properly washed negative.

T. BASSETT.—You must not be discouraged with the first attempts at collotype. It is a process that requires learning, though very simple when the knowledge is acquired. From the plates breaking so frequently, we suspect that the platten of the press is not perfectly true. That is a very common fault with second-hand presses.

SUBSCRIBER (Leeds).—The alternating current can be used for electric lighting for portraiture. A Brockie-Pell lamp will answer as well as any. Better, however, leave the selection of the lamp to those who supply the current, unless you happen to have a lamp by you. A light of from five to six thousand candle power is a convenient one to employ for studio work.

P. GUTTENBERG writes: "I should esteem it a great favour if you would kindly give me some information, or tell me where I could obtain it, concerning the manipulations of photo-lithography, what the process is, and the easiest way of working it.—See the ALMANAC for last year, Hardwich's *Photographic Chemistry*, or Burton's *Photographic Printing Processes;* also back volumes of the JOURNAL.

MR. LOUIS MELDON writes: "A considerable time ago I read in your paper how a gentleman treated dry plates at a bazaar so as to cause them to answer as quick positives like ferrotypes. Can you tell me the process or put me 'on' to him, that I may learn the treatment for a like purpose? Ferrotype would, I fear, make too great a mess of my dark slides."—In reply: The process in question is described by the Earl of Rosse at page 357 of our volume for 1887.

A. COX & CO. write: "Can you oblige us with the title and publishers of any work which goes into the details of the manufacture of carbon tissue?"—We know of no such work, nor is it at all likely that one is issued. In all works on carbon printing it is assumed that the worker will prefer to purchase the tissue the same as the silver printer does his albumenised paper. The specifications of Swan's and Johnson's patents describe the way tissue is made, but, of course, do not give very full working details.

NEW STUDIO.—The design for the studio is admirable, and cannot well be improved upon, though the proportions may be. We should suggest that the height from floor to gutter be increased eighteen inches or two feet. That will bring the ridge proportionately so much higher. If the glass comes to within three feet of the floor with that width of studio, it will be sufficient. As twenty-one feet is rather short, we should advise three or four feet longer. That will enable full-length portraits to be obtained with lenses of sufficiently long focus to secure moderately good perspective.

S. BRINKWOOD says: "I have been making some experiments with the dusting-on process, and have tried the formulæ given in the ALMANACS and elsewhere but all with the same result—failure. So soon as the powder—plumbago of the best quality I could obtain—was brushed on, it adhered all over, and scarcely showed any image. Although the exposure was doubled and tripled, it seemed to make little or no difference. What is the reason?"—Evidently the film contained too much moisture when the powder was applied. The successful working of the powder process depends upon the hygroscopic condition of the film. If it is too moist—a very common fault at this season—it will behave just as our correspondent has found. The film should be thoroughly dry when it is printed, and then dried again when it is taken from the printing frame. It will then quickly absorb sufficient moisture from the atmosphere to cause the powder to adhere where it is required to form the image.

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THE BRITISH
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THICK OR THIN FILMS.

"If I can see the image well through at the back of the plate, or, indeed, any way but most faintly in the high lights, that brand of plate will not suit me." "I must be able to say when development is complete by seeing the image well out at the back, or the plate will not suit me." Within a brief space of time we heard both these utterances, and from the mouths, be it said, of experienced and clever workers. The question naturally arises, Are both speakers right? both wrong? or is there a right and wrong view at all on this point? It is one we have given much attention to, and upon which we have formed a definite opinion, but not without considerable difficulty. The chief difficulty arises from the danger of confusing the issues when attempting to differentiate the qualities of a plate. Every one is aware that the plates now on the market vary very considerably—one make against another—in the appearance of the developed negative. In one the developed image is almost as visible upon the back as the front; in another there is usually nothing at all to be seen at the back (unless an extremely bright object is included); in still others there are all ranges of image visibility between these two extremes. Further, each of the recognised brands is used largely, and with each pictures of high merit have been taken. It is further known that when a photographer becomes used to a particular plate he generally praises it as the best to be had, and, if he be at all critical in his examination of his plates in their various stages, it is scarcely to be wondered at if the characteristics his favourite plate exhibits are looked upon as means to an end; in other words, that their tendency is in the direction of assisting to produce that end. Hence, if one works with a thin-film plate, and likes his results, he probably will not be tempted to try another make simply because it has a thick film. Still more operative does this inertness become when it is considered that the merit or demerit of a plate cannot possibly depend solely on the fact of the image showing or not showing at the back.

We are thus driven to argue on theoretical grounds, rather than by exhibiting practical results. There is, of course, before us the Sandell plate, the makers of which, in effect, say, "Our plate has certain good qualities not possessed by ordinary plates, simply because it is a plate with a very thick film, this quite apart from other good qualities it possesses."

Some makers of thick plates argue that this quality is obtained because there is an unusually large proportion of silver in the plate, and that consequently the image will have more pluck and a larger range of gradation. Other makers will reply, The thickness does not necessarily depend upon the amount of silver present, and that they take their stand on the merits of their plates, thick or thin.

Thus the conflicting elements are so strong that it would be most probable that when any one was guided by the thickness or otherwise it would only be when he had to decide between two brands of apparently equal merits. Consequently there is only left for consideration the possible relation the point we are dealing with has upon the quality of the image.

What, then, is this relation? Briefly, it is as follows:—When the image is received, during exposure, upon the plate, if the illuminated parts are thin enough to permit some of the actinic light received to pass through the film, it is reflected from the back, at the back of the plate, upon the under side of the film. This much is indisputable. The next query is, Does this reflected light do any injury? The reply is that sometimes it does and sometimes it does not. Every one is familiar with the halation so often seen surrounding the sky of a landscape, which makes the trees look foggy at the edges, or the roof of a house little different in tone from the sky where the two join. When "halation" occurs, a thin plate has obviously caused it; for, though it shows the more the brighter the sky, it is found in any condition of sky, but slightly in a thick plate.

If the same argument be applied to subjects where the contrast is not so great—taking, as example, a portrait—it may be suggested that, in a thin plate, though the finger cannot be laid on a particular spot, and halation be then shown, it is yet the case that reflection from the back does take place, and that, more or less, the delicate half-tones in the face must be degraded to some extent, and that, therefore, a thick plate must, *à priori*, be superior to a thin one for portraiture.

It is true that a high authority once laid it down that in a thin plate the luminosity, where the image was received, was so much less than with a thick one that there was less light to be reflected at the back, and so a consequent gain. This dictum, however, related, we believe, to a plate of such transparency as is now practically unknown in commerce.

To sum up, we would say that, other things being equal, a thick plate is very decidedly preferable to a thin one, and, to any one halting in his decision as to what plate to start upon, by all means select one that, when the development is concluded, will not show the image upon the back. And our last word is: Thick plate or thin, an infinitely better average of quality in results is obtained if all plates employed be backed with a suitable medium.

THE WET-COLLODION PROCESS.

VII.—Alabastrine Positives.

Almost simultaneously with the discovery of the collodion process Archer made the further discovery that the silver image could be rendered white by being treated with a solution of bichloride of mercury. This, having been followed up, culminated in the alabastrine process.

The name itself is pretty and suggestive of the nature of the photograph. Still, when well made, the picture exceeds, in the pearliness and purity of its tones, the finest alabaster possible to be obtained; indeed, there is an inexpressible charm about an alabastrine positive, added to which is the pleasing fact that it is one of the most permanent of the numerous fraternity of the photographic family. As above hinted, the basis of the alabastrine photograph is a collodion positive; but, in order to obtain the best effect, the whites must consist of a denser deposit of silver than is requisite for an ordinary positive.

A developer that has been recommended for this class of picture consists of a mixture of solutions of pyrogallic acid and protosulphate of iron, nitric acid being present; for, as every chemist knows, if this latter acid were omitted, the mixture of the pyrogallic acid and iron would form a solution as black as ink, to which, indeed, it would be closely allied. We do not say that such a developer is necessary in all cases, for we have obtained many admirable results with a plain iron developer.

A suitable formula consists of the following :—

Protosulphate of iron	15 grains.
Pyrogallic acid	3 „
Nitric acid	3 or more drops.
Water	1 ounce.

If the solution be black from the formation of gallate of iron, one or two drops of nitric acid more must be added.

The bleaching solution consists of—

Hydrochloric acid	4 drachms.
Nitric acid	4 „
Bichloride of mercury	*quant. suff.*
Alcohol	4 drachms.
Water, distilled	6 ounces.

It is best to omit adding the two last until the acid mixture has dissolved all the mercury which it is capable of doing.

The plate, having been fixed and well washed, is placed on a levelling stand, and enough of the above to cover the surface is poured upon it. At first the picture will, in some cases be darkened, even to disappearance, by reflected light, but it will gradually lighten up, until eventually it acquires a colour of a character quite different from what it originally possessed, having now a pearly-white appearance. This may take from five to thirty minutes, according to temperature, &c.

It might reasonably be thought that the nitric acid present would have a solvent action on the image, but it has scarcely had time (even when present in a much larger proportion) to act ere the mercury has also acted and counteracted this tendency.

In washing the picture distilled water ought to be used. If there is any alkali present in the water, the purity of the whites will be degraded. Fortunately, little washing suffices, as the film is now in a very spongy condition. The purity of the whites is improved when dry.

Instead of the bleaching formula we have given, another containing protosulphate of iron was at one time recommended; but, having made comparative trials of both, we give preference to that given above. The following is the one in question :—

Bichloride of mercury	80 grains.
Protosulphate of iron	40 „
Chloride of sodium	30 „
Water	4 ounces.

In our estimation, alabastrine pictures ought not to be varnished, at any rate, as the term is usually employed. We have said that the image is of a spongy nature, and any varnish which is applied should be so thin as to be absorbed by the whites, leaving a glaze on the blacks. After having tried every preparation sold or suggested when these pictures were fashionable, and when recipes for the preparations required in their productions were privately sold at a high price—a guinea for any one being a usual charge—we came to the conclusion, after numerous experiments, that the best effect was obtained by the application of a varnish, if such it could be called, composed of spirits of turpentine, holding in solution such a modicum of Canada balsam as when spread upon glass formed a film of extreme attenuation. This is seemingly quite absorbed by the image, which remains matt as before, but it is apparent in the blacks, to which it imparts additional lustre.

This application also permits of the image taking on colours to any desired degree of depth, the colours referred to being those in powders, so well known and so extensively used in Daguerreotyping and subsequent times. The surface, without this preparation, takes the colours quite well, but with it a greater depth is possible.

Owing to the peculiar texture of the collodion, the colours may, by the application of a stronger varnish than the above, be caused to penetrate the body of the image, and become equally visible from either side.

If a picture thus taken be mounted in a morocco case, with a piece of black velvet behind and a colourless glass in front, it will vie in beauty with the finest productions of the ivory-miniature painter, while, as regards permanence, it will remain absolutely unchanged.

CHARACTER OF NEGATIVES FOR DIFFERENT PRINTING PROCESSES.

Although during the past year or two a good deal has been written on the subject of density and gradation in negatives, we doubt whether any considerable section of our readers trouble themselves much with the question or recognise the importance that attaches to the production of the right degree of gradation to suit particular printing processes. Too frequently the quality of gradation is lost sight of entirely, or merged into that of density, and if a negative present a certain degree of opacity in the light, and has been exposed such a length of time as to give a due amount of detail in the shadows, it is assumed to be all that can or need be desired.

Yet such a negative, while it may be of the very character or gradation to suit one process, may at the same time be utterly unsuited to another or others; and we think that it is high time that a little more attention was given to this matter. To the majority of amateurs who confine themselves to one method of development and one printing process, the question is not one of grave importance so long as they pursue the beaten track, but the instant they depart from that course they are liable to be landed in a sea of difficulties. More especially is this the case in changes of development, for as we

hall endeavour to show, the difference of gradation rendered y different developers, other things being equal, is far greater han would be imagined.

If we travel back in retrospect to the period anterior to the eneral adoption of albumenised paper, we shall find that, in onjunction with the plain paper of that day, iodised collodion, ither wet or dry, and acid pyro or gallic acid development ere almost solely employed, conditions which tended most rongly in the direction of density of image and strong con-rasts. As a matter of fact, the negatives of that period, hether upon glass or paper, are chiefly remarkable for a egree of density and of contrast—or, to combine the two erms into one, of *intensity*—that would alarm the present-day orker. The character of the positive paper then employed ecessitated this great density, and one of the contingent re-ults was the formation of an image which, from its robustness richness in silver and gold, was far more permanent than any of those at the present day.

Along with the introduction of albumen paper there came, most contemporaneously, bromo-iodised collodion and iron evelopment, and the softer and more delicate character of the nage obtained by these means proved eminently suited to the equirements of the more brilliant positive surface. Later, the onditions became still further varied by the introduction of ne still more brilliant double albumenised papers, whose extra igour was compensated, where necessary, by weaker salting, s well as by the use of still more delicate negatives.

With the general adoption of gelatine plates there came an ntire change, or series of changes. The wonderful power ossessed by these films of searching out feeble details in the eaviest shadows, especially in dark draperies and foliage and feeble light, made photographers acquainted with quite a ifferent character of negatives to what they had previously een accustomed to, and they were not slow to utilise the new ower, with the inevitable result that it was somewhat over-one. The facility with which dark draperies could be made o yield detail, as well as the fine gradations in flesh shadows, nded in the former becoming too "Salomonesque" and the tter altogether too heavy, and then, both in portraiture and andscape, the cry arose of want of "sparkle."

These faults have, however, long since been recognised and emedied, and we suppose very few even of the most inveterate raisers of the glorified past would now deny the possibility of oing as good all-round work with gelatine plates as with wet ollodion. True, the latter still retains its supremacy in cer-ain classes of work, but it is perhaps more on the score of con-enience than of necessity, and we cannot ourselves altogether void a feeling of regret when looking back at some of our old ollodion negatives, although in actual printing qualities the nore modern ones may be, at least, their equal.

However, our object in the present article is not to contrast vet collodion with gelatine, but rather to point out where, from vant of care or recognition of the conditions, gelatine itself nay fail to give the best class of results. This is more especially he case at the present day than it was fourteen or fifteen years go, when emulsion plates were just coming into vogue. Then ve had practically but one developer, for ferrous oxalate can carcely be said ever to have taken any hold upon public fancy or negative work in this country, and our printing methods vere confined to albumen paper, and the recently introduced latinotype.

The latter process was at once recognised as requiring a very different type of negative to those already alluded to as presenting the maximum of delicate detail with very little density. Platinum declared for strong, vigorous images, full of gradation from opacity to clear glass, a class of picture then very seldom arrived at, even by accident. Albumenised paper, too, it was found, had to be sensitised in a stronger bath in order to give anything like a brilliant image, and ready-sensitised paper, with its strongly organic character and vigorous printing qualities, soon began to grow in favour, until to-day the home-sensitised article is rarely heard of.

But, nowadays, not only are our printing processes legion, but the methods by which the negative images are produced are nearly as numerous as well as varied in the character of their results. Under the circumstances, therefore, it is not at all surprising that some want of uniformity, to use a mild expression, should so frequently be noticeable in the work of the same individual. If we add to these two already mentioned conditions the fact of there being also so many variations with plates themselves, in rapidity as well as in general character, we can scarcely wonder that some of our friends, who are constantly wandering, like butterflies, from flower to flower in search of some new thing, should so rarely hit upon a result that proves satisfactory to them.

Space will scarcely permit of our entering into this subject as fully as we might do, nor can we hope to point out the conditions to be observed under all circumstances; but we may be allowed to indicate one or two points which may with advantage receive attention at the hands of those who experience any difficulty in obtaining uniformly satisfactory results.

It may be laid down as a general rule that, the more vigorous and brilliant in its printing qualities a process may be, the thinner and more delicate will be the negative required to give the best results, and *vice versâ*. Thus, in the old plain-paper days, a process remarkable for its soft and "velvety" results, a very dense, or, as we should call it now, *hard*, negative fulfilled the necessary conditions; while, to go to the opposite end of the scale, and take some sorts of gelatino-chloride paper, or carbon tissue sensitised in a feeble bath, we require a negative possessing far greater delicacy.

Now, as we know perfectly well, there exists a very wide range between the images produced by the different developers now in vogue, or even by the same ones used under different conditions, and it seems folly on the part of any one to adhere blindly to one particular developer for all purposes because he has found it answer in one particular department. Thus the developer that gives the best result for general landscapes, or the mixture of ingredients that best serves that purpose, is not necessarily the best for portraiture; indeed, the fact of its being perfect for the one is almost sufficient to unfit it for the other.

Again, to go further, the best developer for out-door portraiture would be altogether unsuited for portraits in an ordinary room or in a studio presenting considerable contrasts. Out of doors the flood of light in all directions destroys contrast, and a developer is indicated that will give much density and increase the contrasts. Indoors the reverse conditions too often prevail, the gradation from light to shade being too sudden, if anything, and requiring a developer that will bring out detail without too much vigour.

We mention these instances to briefly illustrate the variations that may be made, and for the purposes named we should, for landscape work and out-door portraiture, be rather inclined to use pyro or other density-giving agent; while for interior work, whether portrait or architectural, we should give prefer-

•nce to one of the more delicate developers, such as eikonogen, amidol, or metol. These individual agents are, of course, capable of much variation in themselves to produce given results; but the modern style of developing in single solutions has almost killed the power thus formerly possessed.

We have not here referred at all to process or copying work, which, of course, is of a special character, and requires its own special treatment.

Photography in Colours.—Once more M. Lippmann's discovery is "going the round" as something entirely new. Last week an evening contemporary enlightened its readers as follows: "Once more the problem of photographing in colours has been solved. At least, M. Lippmann has been assuring the French Academy of Sciences that he has solved it." Possibly photographers will again receive many inquiries as to whether they take photographs in natural colours, and, on replying in the negative, be informed once more that they are behind the age, and that the thing is being done in Paris.

The Largest Provincial Photographic Society.—We have received the Annual Report and list of members of the Manchester Amateur Photographic Society. The Society, says the Report, still maintains its position as the largest provincial Society in the United Kingdom. At the last General Meeting the membership roll contained the names of 397 ordinary and 3 honorary members. During the past year 65 members joined, so that the numerical strength of the Society during the year has been 462 ordinary and 3 honorary members. After making certain deductions, the Society now numbers 400 ordinary and 3 ordinary members.

Copyright in Photographs.—A letter that appeared in the *Standard* a few days ago over the signature of Mr. John Leighton, F.S.A., writing "as a member of the Copyright Committee that sat at the Society of Arts for three years," anent "The Right to One's Face," is not a little amusing. Here are one or two extracts:—"I would note that photography was then in its infancy, and the objections much less than now, though at that time even I was greatly against its protection; and since that period ghastly things have been done." "Regarding copyright photography, the powerful Committee, with the President of the Royal Academy at its head, were against photographic protection; but, somehow, Mr. Peter Le Neve Foster, the then Secretary of Arts, who was then President of the Photographic Society, prevailed, and a mechanical abortion got the same protection as a work of high art that may have taken years to consummate!" Very good, Mr. Leighton; you are evidently no "false friend" to photography. A more stringent law with regard to copyright in photographs might tend to deter painters from pirating photographers' work in their pictures without permission or acknowledgment.

Blisters.—In our issue for last week is a communication from the Dresden Albumenising Company on the subject of blisters in albumen prints, which has lately been discussed in some Continental societies and journals, the question as raised being, "if there is a preventative besides the two methods of the immersion of the dry print in alcohol before the first washing, and the adding of ammonia to the fixing bath, which are both effective, but troublesome and expensive remedies." The former of the two remedies is that of Mr. W. D. Richmond. The remedy suggested by the writers is a handful of salt to the first washing water after fixing. It is simple, though not with some papers, or under some conditions, always effectual. The Dresden Company rightly say that blisters must be attributed to the increasing demand for highly glazed papers, and that the thicker coating to obtain it makes the paper more prone to blister. True; but could not the manufacture of the paper—the raw material—be modified to meet this difficulty? If we carefully examine a blister, we shall find that it is not the albumen that has left the paper, but that it is the surface of the paper itself that has come away.

Copyright in One's Own Portrait.—The recent case of Monson *v.* Tussaud has been somewhat anxiously watched by photographers as being likely to settle the question as to whether a person has, or has not, a copyright in his own features. It was assumed by some that, if the defendants could be restrained from exhibiting a portrait in wax, so also could a photographer be prevented from exhibiting a photographic portrait. But the counsel for the plaintiff would not go so far as to contend that a man had any such copyright, but relied upon the ground that the conduct of the defendants was libellous in showing the effigy in the way they were doing. During the arguing of the case, that of Pollard *v.* the Photographic Company, tried in 1889, was referred to, but counsel said he could not rely too much upon it, as it was held that the "plaintiff had a right to restrain the sale, on the ground that she was the owner of the negative." The learned gentleman was in error here. The injunction, in that case, was granted on the ground that, when the lady paid for having her portrait taken, there was an implied contract that the negative was not to be used for any other purpose than supplying her with prints—a very different thing. A point that was more than once mooted during the arguments was whether any one could be restrained from exhibiting or publishing a portrait that had been obtained surreptitiously, as is frequently done with a hand camera. No definite opinion was expressed, except in connexion with the motive. It is possible in France that the thing would be prevented as "an interference with private life," and we believe that in America it has been held as a criminal offence.

Injurious Photographic Chemicals.—Metol seems to be gaining, rightly or wrongly, an unenviable character for the injurious action it is said to exercise on the hands of its users. But, be it ever so hurtful, is there any reason why it should be allowed to exert its ill effects? In the development of negatives, only the extreme tips of the forefingers and thumbs need be wetted with the solution, and then only the front portion of them, where the skin is the thickest. In most instances, in handling injurious chemicals, it is only when they come in contact with the thinner portions of the skin—as on the back, or between the fingers—that any harm results. However, indiarubber finger stalls, costing but a few pence each, are to be had at all rubber shops, that will perfectly protect the fingers from all pernicious materials. They are much more extensively used by photographers, both professional and amateur, on the Continent than they are here. Being exceedingly thin, they are by no means uncomfortable to work in. It is curious to note the effect that different chemicals have on different persons. One gentleman we knew, who for years had been dealing with impunity with cyanide of potassium in connexion with electro-plating as well as photography, suffered severely from bichromate of potash. Another gentleman, on whom the bichromate was innocuous, even when used on a large scale, could scarcely touch cyanide without suffering inconvenience. Even the smell of it created nausea and headache. In the wet-collodion days, a friend of ours had to relinquish photography, so far as the development of his negatives was concerned, on account of the injurious action the iron solution had upon his hands.

PHOTO-MECHANICAL NOTES.

It is a singular reflection upon English process-workers that, whilst the screen process of half-tone photo-zincography was cradled in their own country, they have had to look abroad for knowledge of its most practical and beautiful applications. Fox Talbot was, undoubtedly, the inventor of screen methods, his patent, dating so far back as 1852, describing a method of breaking up the half-tones in engraved blocks by means of a "glass plate covered with fine opaque lines." Moreover, Bullock Brothers long forestalled Herr Meisenbach with the shifted-screen process. Yet we failed to grasp the possibilities of these inventions until foreigners had reaped the advan-

tages. It is understood that Herr Meisenbach received 14,000*l.* for the business he established in London, while his patents in other countries completed a handsome fortune, upon which he has retired.

Our American cousins, quicker to grasp a good idea and improve on it, shot ahead of the Old World, and to-day both English and Continental process-workers are indebted to America for the latest and best ideas. No better illustration of this fact can be adduced than that in the establishment founded by Herr Meisenbach in England, American cross-lined screens have largely, if not entirely, superseded the single-line shifted plates which were the essential feature of the patent.

Among the latest things from the land of "notions" is an attempt to solve the problem of securing pure white in half-tone blocks, a matter which has long had the earnest consideration of all workers with the screen. It will be remembered that the early examples of half-tone block work were scoffed at by photographers and artists on account of their flatness, the screen nearly obliterating all the photographic gradation. It was then sought to secure whites by painting out portions of the negative with opaque varnish, or by etching and routing out the stipple on the zinc, a result which, either way, gave a silhouette effect that was even worse.

The Yankee inventor comes along and claims a patent for one of those ideas which you "wonder you never thought of before." His specification is *not* a marvel of lucidity, but, reduced to simple terms, his method is as follows:—The exposure is divided into two periods. During the first period the exposure is made without the screen, which is thereafter inserted, and the exposure continued for the other period. Obviously the process may be *vice versâ*, but, deducing from the first-mentioned way, it will be well understood that, while the exposure in the first period would be too short to appreciably affect the shadows and half-tones, it would go far towards blackening up the high lights of the negative, so that the screen, when inserted, would be ineffective in producing the transparent spaces which correspond to dots on the zinc. The result would be an automatic vignetting into the high lights.

This I do not doubt may be practicable enough, but it is one thing taking the negative with pure high lights, and another thing etching the plate from it. We will grant, however, that it can be etched; but what will be the result when it comes into the hands of the every-day letterpress printer? You may depend upon it that the chances are a hundred to one he will bring up the vignette with a hard black edge, and all the skilled labour of the photographer and etcher will be thrown away.

The fact is, that the best work of English process-engravers is never brought to light, owing to the tyrannical sway of the British printer—exceptions, of course, prove the rule. We have known many cases in which publishers have asked the process-engraver to give an example of the best work he can do. He naturally fixes up his finest screen, knowing that only by its means will he get softness and detail. A lovely block is produced, and, in the engraver's hands, renders a beautiful proof, which is duly admired by the customer, but in a few days the block is, as likely as not, returned with the intimation that the "printers can't print it."

There is a dodge for vignetting blocks not generally known, which may lessen the risk of printing with a black edge. It is to stamp down the margin of the plate into the wood mount by means of a broad-pointed steel punch, so that the margin of the plate is on a lower level than the centre portions.

A non-photographic paper which publishes the specification of the American process funnily heads the article with the line, "Removing the High-lights from Half-tones."

The description of this process calls to mind a method of producing softened contrast in half-tone blocks which has been in vogue for some time past in certain studios, but is not yet generally known. In this, likewise, the exposure is divided into two periods. During the first period the lens is allowed to work at full aperture, or with a large stop, but during the second period a smaller stop is introduced. The result is that the cross-hatching in the high lights of the negative is not so thickened as to produce dots on the zinc of such fineness that they etch away too readily. At the same time the shadows are broken up with a little stippling of light. The etchers prefer such plates to work upon, but from an artistic point of view they lack vigour.

I fail to see why there should be this striving to secure a grain all over the picture. A black should print black, and not a dark cross-hatching. Process-engravers are too much bound up with attempting to get a perfect hatching instead of a nicely gradated picture. It would be far better to let the lens and the screen, *plus* light, render their own effects, and it is easier, in fact, to let the process work out its own salvation.

I am often asked what is the most profitable branch of photographic process work, and it may be well therefore to set forth the relative commercial advantages of the different photo-mechanical processes. Photogravure, the most artistic and beautiful of all the etching processes, can never be widely used on account of the slow and costly production; it is, consequently, rather a process for the *dilettanti*. Herr Klic, to whom we are indebted for the practical working of the present photogravure process, though not the actual invention, attempted some time ago to popularise the photogravure grain for letterpress printing, but it was found to print badly, and the venture was commercially a failure. Collotype and Woodburytype can only be profitably worked on a large scale, necessitating very extensive plant, and even then it is often difficult to make ends meet. Photo-lithography is only useful as an adjunct to a lithographic printing establishment, and it is doubtful whether it could be made to pay if worked separately, though two or three firms make a very good thing in supplying transfers to the trade, *i.e.*, to lithographic printers. Photo-zinco in line can be worked with a very large output, but prices are cut down to the very smallest margin of profit. Photo-zinco in "half-tone" is the most hopeful of all if prices keep up. Worked systematically it is quickly done, and the use of these blocks is largely extending. Photo-chromotypy is in its experimental stage, but no doubt there is a great future before it, and the earliest in the field will reap the pecuniary advantages.

WM. GAMBLE.

GAS CYLINDERS.

[Central Photographic Club.]

GAS cylinders have been brought into rather disagreeable prominence lately by the sad explosion of a cylinder at Bradford. A great deal has been said and written on the subject since that accident took place, and it is, perhaps, in itself no small testimony to the safety of the compressed gas business, and the confidence hitherto felt in the use of cylinders, that this one accident should have produced so much uneasiness, not only amongst cylinder-users, but also amongst many of the general public, to whom it apparently reveals, for the first time, what they consider to be an element of public danger.

To-night I shall endeavour to prove to you the safety of the compressed gas business by describing, first, the construction of cylinders; second, the results of tests which have been made upon them; and, third, the methods employed by the compressing companies for proving, testing, and registering them before filling them with gas. In doing this, I don't want to turn this paper into any kind of business advertisement, but at the same time it will be impossible to avoid constant reference to the Brin Company, for it is through my connexion with that Company that I have gained what experience on this subject I may happen to possess.

OLD FORMS OF CYLINDERS.

Cylinders were first employed about a quarter of a century ago for the storage and transport of nitrous oxide and carbonic acid, and some years later the same cylinders were used for transporting oxygen and hydrogen gases for limelight and other purposes. They were large in diameter, heavy and clumsy, and were made, I believe, from both lap and butt-welded iron tubing, and they had thick flat iron discs welded in at each end, into one of which the valve was fixed. I have seen many of these cylinders, and I have no doubt that, so long as the pressure of the gas they contained was limited to fifty atmospheres, they were perfectly safe for use. Their great weight, however, for a comparatively small quantity of gas, made them very expensive and cumbersome as a means of transporting gases, and consequently, with the development of the limelight, and the increasing demand for compressed oxygen and other gases, far better types of cylinders have in recent years come into the trade, with the result that the old iron ones have to-day practically disappeared. It would be unfair to gas-makers and compressors of old standing to attribute this desirable change entirely to the Brin Company, for good steel cylinders, similar in many respects to those now employed, were in use when the Company commenced business nearly eight years ago. It is undoubtedly, however, from that time that the rapid development of the trade dates, and the types and sizes of cylinders now supplied by the Brin Company, have become recognised standards throughout the trade. Thus, without wishing to disparage in any way the work done by others, I may, I think, preface my description of the cylinders now employed by the Brin

Company by saying that, to a great and almost general extent, the description applies to the cylinders employed throughout the compressed gas trade.

How Cylinders are Made.

Cylinders are now made of mild steel, and they are either lap-welded or solid-drawn. The lap-welded cylinders are made from ordinary rolled and welded tubes, which are first cut to the length required and then welded up solid in a spherical shape, and finally swaged or drawn down at the other end on to a dove-tailed ferrule, which is screwed to receive the valve. Solid-drawn cylinders are either made from seamless tubing, which is cut to the length required and has the ends closed in exactly the same manner as in the case of lap-welded cylinders, or else they are made from a circular steel slab containing the requisite amount of metal to ultimately make the size of cylinder required.

This latter is the type most popularly known as the solid-drawn cylinder. The slab is repeatedly heated, and pressed by hydraulic power on various mandrels, through dies, until the form is nearly obtained. It is then drawn cold to the finished size, and carefully annealed in order to restore the metal to its original state of ductility. In this way a tube open at one end, but closed spherically at the other, is obtained; and, finally, the neck is formed as in the case of the other cylinders. This solid-drawn type of cylinder was first introduced by Mr. Howard Lane, of Birmingham, who has patented the process for manufacturing them. These patent rights were transferred in 1891 to the Endurance Tube and Vial Company, Limited, of Birmingham, and this Company, together with the firm of Samuel Walker, of Birmingham, to whom special rights have been granted, are, I believe, the only makers now working under the Lane patents.

To discuss the relative merits of these types of cylinders is to enter on somewhat delicate ground. It is claimed for the solid-drawn cylinders that the process of manufacture acts beneficially on the strength and homogeneity of the metal; and it is found, from actual tests, that the ultimate tensile strength of the metal of a solid-drawn cylinder ranges from about twenty-nine to thirty-three tons per square inch, as compared with twenty-five to twenty-seven tons per square inch in the case of lap-welded cylinders. Solid-drawn cylinders are consequently made rather lighter in sections than the lap-welded, and in the smaller sizes have become undoubtedly more popular than the latter type. In the larger sizes each type of cylinder has its supporters, and, in point of fact, when they are proportioned so that the minimum thickness of the walls in each case is in accordance with the relative ultimate tensile strength of the metal, there is not much to choose between them.

Dimensions and Strengths of Cylinders.

All the cylinders now used by the compressing companies are made to contain certain convenient quantities of gas at a pressure of 120 atmospheres, this being the standard filling pressure at present employed. Cylinders are made of all lengths, but their thickness varies only with their diameters and type. Thus the *minimum sections* now supplied by the companies are as follows:—

4	inches	external	diameter,	solid-drawn	type,	are	$\frac{5}{32}$	inches	thick.
$5\frac{1}{2}$	„	„	„	„	„	„	$\frac{7}{32}$	„	„
$5\frac{1}{2}$	„	„	„	lap-welded	„	„	$\frac{1}{4}$	„	„
7	„	„	„	solid-drawn	„	„	$\frac{9}{32}$	„	„

Good cylinders, of other diameters and thicknesses, are in use, but the above are the most popular, and the general tendency of the trade is to adopt these diameters exclusively.

As regards the ultimate strength of cylinders, many tests have been made in order to ascertain their bursting point and elastic limit, and, as they are now all constructed of nearly proportionate strength, the results may be generally summarised as follows:—

Pressure per square inch at which cylinders burst.

Lap-welded	$2\frac{1}{2}$ to 3 tons.
Solid-drawn	$2\frac{1}{2}$ „ 3 „
Expressed in atmospheres	373 „ 448

Limit of elasticity per square inch of metal.

Lap-welded	16 to 18 tons.
Solid-drawn	20 „ 23 „

Ultimate tensile strength per square inch of metal.

Lap-welded	25 to 27 tons.
Solid-drawn	29 „ 33 „

Having now briefly described the essential features in the construction of cylinders in use, I will turn to the point which is, after all, of most importance to lanternists, viz., the reliability of these cylinders for the transport of compressed gases.

First, with regard to the lap-welded type.

Lap-welded Cylinders.

It has been raised, as an objection to these cylinders, that the fact of their being welded makes them less reliable than the solid-drawn or seamless type, and that the cylinder walls have to be thickened throughout in order to ensure the requisite ultimate strength in the weld, thus involving heavier cylinders. I will at once admit the accuracy of the latter portion of this argument. Lap-welded cylinders, fulfilling the conditions of strength I have already mentioned, must be slightly heavier than the solid-drawn of the same capacity, and it is in this respect that the solid-drawn or seamless cylinder can lay claim to superiority. During the last seven years I have seen many thousands of each type, and all these cylinders have been subjected by us to rigorous hydraulic and other tests. Some of them (and particularly in the early days, when cylinders were less uniform in size and thickness than they now are) have given way under these tests, and my experience is that, whereas the fracture in a solid-drawn cylinder is uncertain, that in the lap-welded is almost invariably at the weld. I feel almost confident that, had these latter burst under gas pressure, instead of water, the only difference would have been that the tear in the weld would have extended further. The metal would still have remained all in one piece, and no serious damage would have been caused by the explosion.

Another important feature about a lap-welded cylinder is that the very fact of welding must ensure a mild and ductile quality of steel when the bottle leaves the maker's hands, so that there is no chance of a hard or brittle cylinder of this type getting into the market.

There are two important reasons, therefore, why this very weld, which many people take exception to, should be regarded in the light of a merit rather than a defect, viz:—

1. As it constitutes one longitudinal source of weakness throughout the entire length of the cylinder, it is much more likely, in the event of an explosion, to rip open in the seam, and thus cause little or no damage, than it is to fly to pieces.

2. The weld ensures a ductile quality of metal.

As evidence of the strength of lap-welded cylinders, and their reliability for transporting gas, I have here to-night three cylinders of the standard sections and diameters already quoted. These cylinders are the property of our Scotch and Irish Oxygen Company, who have kindly lent them to me to show you. In March, 1890, the cylinders were subjected to some very severe tests, made with a view to ascertaining the amount of rough treatment which a cylinder of this type would stand without bursting. The tests were conducted in a pit at Stevenstown, near Glasgow.

Nos. 1 and 2 were charged with 120 atmospheres of oxygen in the usual way.

No. 3 was filled with liquefied carbonic acid.

No. 1 cylinder was twice raised to a height of thirty-five feet, and dropped horizontally upon a solid iron block twelve inches square, each blow bending the cylinder to the extent of about three-quarters of an inch. It was then dropped vertically on its spherical end, having a clear fall of thirty-one feet, when it was found that the impact had only flattened a part about the size of a penny piece. It was crushed with a fifteen-tons blow, received while it lay across an iron block, and it was finally bent with the same blow into the shape shown, whilst it was supported on two anvils set four feet apart.

No. 2 cylinder was dropped horizontally across an anvil five times from a height of thirty-five feet, receiving the blow each time on the same spot.

No. 3 was dropped twice from a height of thirty-five feet, and then crushed into the shape shown by a fifteen-tons blow. On these cylinders being subsequently gauged, they were found to contain the full quantity of gas.

Solid Drawn Cylinders—The Bradford Accident.

I need make no further comments on these remarkable tests, but will pass on to consider, secondly, the solid-drawn type of cylinder,

The interesting experiments recently conducted by Professor Goodman, of the Yorkshire College, Leeds, were exclusively on this type of cylinder, and it is one special make of solid-drawn cylinders which has become discredited since the Bradford accident, and which the oxygen companies, for reasons to which I shall refer, have now at length decided not to fill. The question of the safety of cylinders for rough handling turns largely on their annealing. In describing their construction, I said that, after being finally drawn cold through the last die, they were carefully annealed, in order to restore the metal to its original state of ductility. To do this, the cylinders, before leaving the maker's works, are heated to a dull-red heat in a suitable furnace, and then allowed to cool down slowly in another chamber. This point of annealing in connexion with solid-drawn

cylinders is one which the Brin's Company has never disregarded, and we have from time to time made experiments on new cylinders just to prove the maker's *bona fides* in this and other respects, and I may say at once that, until the Bradford accident, we have never had occasion to question the care or skill with which all the makers of this class of cylinders have conducted their business.

The Fatal Cylinder.

Professor Goodman, by his tests on fragments of the exploded cylinder, proved beyond question, as stated at the coroner's inquest, that the Bradford accident was due, primarily, to the cylinder not having been annealed, and one of the most serious features of the case was the fact that it had passed the tests of an oxygen company, and had been filled with gas by them in the firm belief that it was safe for use. In short, the accident showed that, with all the tests employed by the compressing companies, it was possible for an unannealed, and consequently unreliable, cylinder to get into circulation, and it has served at least one useful purpose, inasmuch as it has proved the necessity for the adoption of reannealing as an additional safeguard.

The cylinder which exploded at Bradford, however, was proved to be not only unannealed, but also of unsuitable metal, and the natural question it gave rise to was this, If makers can send out one cylinder of this kind, why not more? The oxygen companies were placed in an awkward position by the accident. If they continued to fill cylinders of this particular make after the facts which came to light at the inquest, they assumed grave responsibilities. If, on the other hand, they refused to do so, they would cause many of their customers serious inconvenience and loss, and might further do unwarrantable injury to the business of the cylinder-makers in question. All these points were seriously considered, and I am convinced that we adopted the only fair and rational course. Some day, should the necessity for our doing so arise, or should the makers at any time demand it, we are ready to make public our reasons for definitely refusing to fill any of the cylinders of this make which are now in the trade. Meanwhile, I need only state that, in adopting this course, we have acted, not through any of the motives of hostility which have been attributed to us by some, nor even on our own judgment alone, but on the unhesitating recommendation of a well-known and absolutely impartial expert, in whose hands we placed the matter for decision.

Kenneth S. Murray.

(*To be continued.*)

AMERICAN NOTES AND NEWS.

The "American Annual."—The *Edition de Luxe*, or author's edition of the *American Photographic Annual* for this year, is probably one of the finest volumes, as a book, which has entered this country from the United States. Rich morocco, resplendent gilding, not to speak of the outcome of mind within its boards, and its general ornate get-up, constitute an annual which has never been rivalled save by its some previous year's issues of its own series. There's no falling off anywhere about it. May its shadow never get less!

"Wilson's Magazine."—*Wilson's Magazine* has our congratulations upon having completed a thirty years' existence. Although changed in name, we still look upon it as a continuation of the *Philadelphia Photographer*. We feel assured that its usefulness will never decrease.

A Coming Background Law Suit.—A law suit is looming in the United States. It appears that a patent was obtained on February 3, 1891, by W. G. Entrekin, for a background sufficiently long to be suspended over a bar at the top, and brought out below in such a manner that the subject stands upon it. In short, it is continuous from the foreground to the top. This device has been used by W. F. Bacon, and Entrekin is suing for infringement of patent. Dr. Wilson publishes a letter from George G. Rockwood relative to his having used such a background for several years previous to the date of the patent. It is a pity that photographers should be harassed by patents for inventions that claim to have been long in use.

Photography by Organic Substances.—Dr. Arthur H. Elliott suggests, in *Anthony's Bulletin* (which henceforth is to appear monthly), the desirableness that a fertile field for future photographic research which lies in the domain of the action of light on organic compounds should be cultivated. What, he asks, are the effects of light upon the growing flower? How can we imitate these effects, and repeat them in the chemical laboratory? An answer to these questions will, he believes, lead us to make pictures from organic substances, and ultimately in all the varied hues of the floral world. This is no fancy dream, but the firm conviction of those who have given thought to the possibilities of photographic research in organic chemistry. It is confessedly unsafe to prophesy as to ultimate possibilities of photography, so we will content ourselves by expressing the hope that Dr. Elliott will live to see his pretty idea carried out to a practical issue.

An Unusually Powerful Flash Lamp.—The journal just named contains an account of a flash lamp or lamps, seeing it has thirty-six burners, which certainly ought to do every thing by way of lighting a sitter of which quick-acting artificial illuminants are capable. Just think of it! a group of eleven babies was taken by its agency, no trace of a movement in any of them being apparent. It consists of a rigid tripod supporting an upright tube of about eight feet in length. Six pipes, each five feet long, project at right angles from each side of the centre tube. These are a foot apart and in each of them holes are bored at intervals of a foot. These are the gas jets, behind each of which is a pan to carry the flashing powder, which consists of blitz pulver in preference to pure magnesium powder. By pressure on a rubber bulb a spring is released, which, actuating a metal rod, throws each powder pan upwards and forwards, ejecting the powder over the gas flames. The same pressure releases the lens shutter, so that the flash and exposure are simultaneous. We have no doubt that, from the well-known mechanical ingenuity of the Americans, this will necessarily prove an effective means of lighting; but the idea certainly belongs to Mr. Slingsby or Mr. Hart of this country, both of whom have had similar systems of lamps both in use and on sale for some years past. Attention is directed to the important fact that, as the light from the gas jets is considerable, the eye becomes accustomed to a fairly strong light before the flash is made. The journal from which we learn these particulars is illustrated by a capital portrait of Sarony, made by this lamp, which is designated the "Williams Flash Machine." This portrait is a reproduction from the original, which is 17×14 inches in dimensions.

Balloon Photogrammetry.—Those interested in this subject will find in the December *Journal* of the American Philosophical Society a capital paper on this topic by Prof. Meade Bache, of the United States Coast and Geodetic Survey, which was read before the Society. He described two balloon systems, one for application in various ways to the delineation of portions of the earth's surface, the other for military purposes.

PHOTOGRAPHERS AND POISONS.—THE RIGHT TO PUBLISH A PORTRAIT.

An action which has been recently tried in the Westminster County Court has, if not a direct interest to photographers, certainly an indirect one, since it involves the question of the action on the skin of a dilute solution of a substance in constant use in photographic laboratories, mercuric chloride; and also since, as it appeared from the evidence, the sale of an extremely attenuated, and therefore practically harmless, solution of a scheduled poison had been the means of obtaining a conviction of the vendor under the "Sale of Poisons Act." The action referred to was brought by Madame Anna Ruppert, the well-known—or, perhaps I should say, the well-advertised—professor of the "art of beauty" against an agent who retailed her specifics to recover the value of goods supplied, and there was a counter claim for loss of business and expenses incurred in the sale of the plaintiff's "skin tonic." In the end the verdict was against the plaintiff as regards those items of her claim which contained scheduled poisons, apparently on the ground that she was

not licensed to sell poisons and was not a wholesale dealer, but for her on the balance of her claim, and also on the counter claim.

This case is interesting to photographers, in the first place, because the defendant relied upon the alleged injurious action of mercuric chloride on the skin for the counter claim. As the solution, sometimes in a concentrated form, is frequently used by photographers, we should have heard complaints had evil effects often occurred from its employment. It is true that it is the hands which in our case are brought into contact with it, and the skin of the hands is thicker and less susceptible to injury than that of the face, to which cosmetics are usually applied; but, that the application of a weak solution, even to the face, is dangerous there is little, if any, evidence to show. Indeed, if negative evidence be admitted, the proof is quite the other way. It is notorious that most (perhaps all) that have any efficacy of the much-advertised "beauty lotions" have for their active principle mercuric chloride, and, in fact, consist of solutions of this substance of about three to six grains to ten ounces of water, fancifully got up according to the selling title. The sale of some of these has been going on for a time exceeding the memory of the "oldest inhabitant," and, although we may have heard much of the folly of using them, their strongest opponents speak vaguely of the danger.

In the second place, this matter interests us because it shows that an Act of Parliament, originally intended for the protection of the community, may be perverted until it becomes an instrument of tyranny. Every one approves of the object of the Acts relating to the sale of poison, which were passed for the purpose of making it difficult for any person to procure poisons dangerous to themselves or their fellow-creatures, but it was never contemplated that they should be put into force to the hindrance of arts, sciences, or manufactures, and when the sale of certain scheduled poisons was restricted to only duly qualified persons the object was not simply to create a monopoly in their interests. One of our greatest living Judges, in a decision recently given, said, "the law must be construed with common sense," and it is certainly not a common-sense application of the law to prosecute any one for selling a solution, though it be of a scheduled poison, which would require, to make a dangerous dose, an equally great or greater quantity than would be required of, say, a saturated solution of common alum.

It is the tendency of every monopoly to grow, and the monopoly in the sale of poisons follows the common law. As every monopolist can, and always does, exact his own price, it behoves photographers to be on the alert to protect the interests of themselves and to dealers in photographic materials. In London and in large towns it is difficult to put on the screw; but, in the smaller towns, it is often done, and the consequence is that, while the chemist, unrestricted by any Act of Parliament, invades the domain of the tobacconist, the stationer, and many other trades in which he can compete on fair terms, he also competes with the photographic dealer, who is frequently the local photographer, on very unfair terms indeed.

The Right to Publish a Portrait.

Up to the present time there has been no decision given in the Law Courts as to the right of persons to control the publication of that part of their individuality that is visible and can be portrayed pictorially.

The question has been lightly touched upon in one of the cases in which Mr. Monson, whose trial in connexion with what has been termed the Ardlamont Mystery took place recently, sought to restrain the proprietors of certain waxwork shows from exhibiting effigies of himself in the company of those of criminals and other infamously notorious personages. These cases turned upon the right to exhibit the effigies under certain conditions, and not upon the right to exhibit them at all. Mr. Monson succeeded in obtaining his injunction, though an appeal is pending.

But, as far as the question, that must arise sooner or later, as to the abstract right, to narrow the point, to prevent the publication of one's portrait without one's consent, the matter remains as it was. This is a question that particularly concerns the snap-shottist, whose fancy it is to include in his pictures unsuspecting persons, sometimes taken under conditions which it is hardly likely they would choose to have recorded, and to exhibit the results publicly. It concerns also the photographer, who, in the course of his legitimate business, includes in the views which he publishes the portraits of individuals who happen to be within the range of his lens at the time his exposure was made, and who unwittingly assist in adding value to his pictures.

Although there has been no decision on the subject, there occurred, in the trial of one of the cases referred to an interesting discussion bearing on the point between the Judge, Mr. Justice Williams, and Mr. Monson's counsel, Mr. Coleridge. Mr. Coleridge, having contended that there was a distinction between exhibiting the effigy of a private individual and a public man, "it would be very inconvenient," said the Judge, "for a photograph of a lady to be published without her consent. Suppose some one with a Kodak took a snap-shot of the lady and published it, could not he be restrained?"

Mr. Coleridge was afraid not. "Although it is put on postcards and exhibited in shop windows?" asked the Judge.

"Well, it would depend on the motive," replied the counsel; "George Eliot had a great objection to being photographed. Her great talents were not combined with personal beauty. Would it be justifiable to take a snap-shot photograph, sell it all over the world, and make a great profit, although George Eliot objected? There was no decision one way or other, but there was such a thing as common sense."

It is interesting to learn that so learned a counsel as Mr. Coleridge admits that common sense should be taken into consideration in legal proceedings; but his opinion hardly helps us to form an idea of how a case which turns upon the point under consideration would be decided.

It is pretty clear to us that the only reasonable course would be to consider any case that may arise strictly according to circumstances, and that no distinct line can be drawn to form a boundary to the rights of the photographer. We cannot follow exactly the laws and decisions relating to libel, but their broader principles are generally quite applicable, and it was these upon which the Monson case was argued. The only precedents quoted, and they apply equally well, or badly, to wax figures and to photographs, were culled from black-letter works, and they referred to what, for want of a better term, I must call libels by significant actions. Is it not possible that, when there is a case for decision, the question of copyright may be involved? We are all aware that, when a photographer takes a portrait of an individual by his consent, and without consideration, the copyright is the property of the photographer; but would that hold good if the portrait were taken without the individual's consent? It would be rather a serious matter if an adverse decision were obtained against a photographer. We know that many persons have felt aggrieved at the exhibition of portraits of themselves or their friends taken without their knowledge, and, the ball of litigation once set rolling, who knows where it would stop?

Alexander Mackie.

MEZZOTYPE.

[Abstract of a paper read before the Photographic Section of the Croydon Microscopical Society.]

It has been said that plain salted papers will not keep for more than a week or a fortnight. If this were true, it would be an argument which would militate only against the manufacturer, for such a paper would not be taken into stock by the dealers; but it does not in any way prove the plain salted papers to be bad, and there are surely very few people who would assert that a print on such a paper was not very much more likely to be permanent than anything done on a gelatine or albumen surface, both of which are liable to be affected by damp, but especially gelatine, which will go wrong even without being brought into contact with a silver salt.

If you wish to prove this, coat a piece of paper with a solution of gelatine of the strength generally used for chloride-emulsion work, and before many weeks are passed it will have turned yellow, even if hung in the dark, unless special precautions are taken to keep it dry. Now, all the modern matt-surfaced papers are gelatine-emulsion papers more or less thin, according to the nature of the paper used. With some the full quantity of gelatine is used, and certain chemicals added to destroy the gloss natural to gelatine, and by the time the paper reaches the public the gelatine is saturated with half the chemicals in the laboratory, and its chances of enjoying a long and vigorous existence considerably impaired.

With plain salted papers, or, at any rate, with mezzotype, the only chemicals used are the necessary chloride of silver and a little acid.

If you are going to print a matt surface at all, and have any regard to the permanence of your prints, we strongly advise you to use a plain salted paper.

There are some photographers who are content to get a brilliant surface print with microscopical detail, and, provided they get it, do not trouble themselves about its permanence.

Popular taste has been hitherto in favour of glazed surfaces, and will, I am afraid, remain so for some time yet; but there are some workers who seek greater refinement in their prints—some who, as I do, take a sepia water-colour painting as a standard of excellence in monotone work, and to such the paper I now introduce should come as a boon, for without doubt it gives the nearest approach to a water-colour drawing of any paper yet introduced, and that, too, with the greatest ease, without any unusual precautions.

It is a stout pure paper of excellent quality, and will stand a great deal

of rough handling; it prints fast; is easy to tone; can be toned any known photographic colour, from bright red to an intense black and a grey. Can be mounted dry; indeed, it is better to mount it dry. Can be mounted wet. If you get any mountant on the surface, it does not matter in the least. If you want to experiment, you can dab the mountant over the surface, and with a wet sponge remove it again, and leave no trace. You can dry it at the fire if you are in a hurry, and do no harm. It will keep good longer than anybody is likely to want to keep it, and, above all, you can paint on this paper in water colours with as much ease as if it were a piece of plain water-colour paper. The last is by no means the smallest item in this catalogue of the paper's excellence. It must be of the greatest use to professional men for portrait-painting work, and no doubt to many gentlemen here to-night who, like myself, like to get a little colour into their pictures.

By the introduction of this paper we do not claim to have done anything startlingly original. We claim only to have supplied a want that no one else has been able to do hitherto. We have overcome the difficulty of the preparation of a rough-surfaced paper, and we believe that mezzotype is as perfect a paper of its class as it is possible to make.

We are, however, perfectly ready to admit that it is not easy so to prepare the paper that it will keep well, and no doubt any of you who have attempted to prepare it have found that it soon goes wrong; but none of you will be so rash as to assert that it cannot be made to keep simply because you do not know how to do it yourselves.

I am not here, however, to explain its manufacture, but to show you the best way to use it, and I have brought a few prints that will serve our purpose. They have been printed in the ordinary way of silver prints, and we all know how that is done. I may here mention that the paper prints faster than ordinary albumenised, and should not therefore be exposed in a very strong light, unless the negative has very strong contrasts.

When I get on the subjects of negatives, I confess that I get rather out of my element, and I expect there are few of you who do not know as much or more of negative-making than I do. By a strong negative, I mean one that has clear glass for the shadows, and impenetrable black for the highest lights. I have been surprised at the difference of opinion expressed as to the best negatives for mezzotype by different men who have written about it. Mr. Bond, who read a paper before the West Surrey Photographic Society a short time ago, finds that strong negatives developed with pyro-ammonia are most suitable. Another man, writing about it, finds a delicate negative the best, and so on. My own opinion is, that it does not matter in the least degree how the negative is developed, nor is it of much consequence whether it is dense or thin, within reasonable bounds.

An intelligent printer will contrive to expose the paper to suit any negative. The pyro development is liked because it gives, generally, a negative with a slight yellow veil; this renders printing slower, and contrasts are better preserved. But if you develop with ferrous oxalate, and get clear glass for your deepest shadows, you can still get a print in every respect resembling one from the pyro-developed negative, by covering the glass with tissue paper during exposure, or with paper or glass slightly yellow-tinted. Then, again, if you have a very thin negative, which would print fast without much contrast, you can still get a good print by exposing in a weak light. CHARLES L. ROBINSON.

Mr. Robinson here showed the method of washing and toning the paper. The preliminary washing occupied about five minutes, during which time the print was well sponged on both sides, five minutes' thorough washing and sponging being equal to fifteen minutes' plain washing in running water. The print was then toned in a borax and gold bath, and was fixed for half an hour in a weak hypo bath, the removal of hypo after fixing being greatly assisted by the use of a roller squeegee.

THE PHOTO-AUTOCOPYIST.

[London and Provincial Photographic Association.]

ON Thursday, January 18, the following explanation of the Autocopyist was given:

The apparatus I shall demonstrate to you to-night is called the "Photo-autocopyist," which is a simple system of collographic printing or photo-lithography. With this apparatus it is possible to reproduce from your negatives numbers of prints, in any colour, to suit fancy, which, being printed in lithographic ink, the results are permanent. Photo-mechanical printing serves to save photographers a vast deal of time and trouble, and the question has often been discussed, Why do not photographers more generally resort to it? Apart from the great cost in outlay for the necessary plant which the old processes entailed, the idea is general that much laborious trouble is needful to get any good results. With this apparatus no special learning is required to work it; there is nothing at all intricate about it, simplicity itself from first to last, and a very slight knowledge of photography would carry one through the whole of the working details. The whole apparatus necessary lies before me now, and, with the exception of the press (which you will observe is the ordinary copy press used in offices), can be stored away in this small box. As for the quality of work, I will leave you to judge from the specimens I shall take off to-night whether they are not all that can be wished. The detail of working is as follows:—

This is a roll of parchment, one side of which is coated with a thin film of gelatine; but the parchment is supplied all ready prepared. A sheet of this is cut off the size of printing frame of the apparatus, and is sensitised in a solution of bichromate of potash of two to three per cent., to which are added a few drops of ammonia. The sheet is immersed in this solution for three minutes, and is turned to a bright yellow colour. It is then taken out and squeegeed down on glass which has been previously cleaned and rubbed with French chalk. The sheet is not sensitive to light whilst wet, so this operation can be performed in ordinary light. Drying must take place in the dark, and where no dark room is available it answers as well to place the glass, with sheet, between pink blotting-paper, and wrap in brown paper. Time of drying varies, but no special temperature is required. It is a good plan to sensitise over-night and place in a good dry place, and in the morning the sheet would be ready for use. When dry, the parchment is easily stripped off the glass, and can be used at once or kept for a while. The parchment is next exposed under the negative in an ordinary printing frame, the gelative surface facing the negative. The action of the light upon the film is such, wherever it gains access through the negative the film is hardened and turned from yellow into brown; consequently we get a positive image on the sheet, with the shades etched brown and the lights (protected by the opaque portions of the negative) unchanged. Printing is examined in the usual way at the back of frame, and as soon as the whole of detail is clearly seen the parchment is taken out and reversed in the frame for the back to be exposed to the light for five minutes to harden, to reduce too much swelling in the next operation, viz., the washing out of the bichromate. It suffices to soak the sheet in water, and after two hours the bichromate is removed, and the sheet is then its normal colour—white. Of course, if running water is available, the time is considerably shortened.

On examining the parchment now, the image appears to have faded away and an embossed structure has taken its place. The parchment is now to be stretched upon the printing block, and the underneath surface dried with a cloth, and on the top gelatine surface is poured a solution of water, glycerine, and ammonia. This serves to soften and further emboss the film and preserve its humidity, which is necessary. This solution is allowed to thoroughly penetrate the sheet, and whilst this is doing so we mix up the printing ink. The ink used is supplied in tins in the form of a stiff paste, and you require to thin it out with the varnish. A small portion of ink is taken out with palette knife and placed on ink slab. In the mixing of varnish with the ink about one-third varnish to two-thirds ink gives a printing ink of medium consistency for general work; for subtle gradations a softer ink can be made by adding more varnish. The ink should be well mixed with varnish, using the palette knife, and then spread evenly over ink slab by rolling same backwards and forwards with one of the printing rollers. A second ink slab is necessary for the thinner ink, and a second roller for the same. To prepare the soft ink, roll the hard-ink roller, charged with the hard ink, on to the extra palatte, and to the ink that adheres to the palette add your varnish, mix with palette knife, and spread with extra roller. If only one ink is used, one palette can be used to mix the ink upon, with the one roller, and the other palette for printing from with the other roller. Only a very little ink is required on the roller to ink up the parchment. Inking the parchment is very simple. The surface being damp, the ink only adheres to the parts that have been indented with the light, and therefore the shades only receive the ink, and the lights are clear.

(*To be continued.*)

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF IRELAND.

THIS Society opened its Annual Exhibition on the evening of the 15th inst. by a full-dress conversazione. His Excellency the Lord-Lieutenant had promised to attend, but, owing to a recent family bereavement, Lord Houghton was unable to be present, and, in a letter which was photographed and thrown on the screen, His Excellency expressed his regret and inability to accept the Photographic Society of Ireland's kind invitation. The opening ceremony, probably due to the absence of the Lord-Lieutenant, was not as well patronised as last year; during the evening a large collection of lanterns was shown, and amongst the amusements may be mentioned the sleight-of-hand performance by Mr. W. L. Cooper, one of the members, also Mr. Curtis's *Talking Sailor*, and, indeed, the well-rendered pianoforte piece by Miss Ruthven. Turning to the Exhibition proper, we find, perhaps, the quantity of work sent in all round less than that of last year; this deficiency is, however, made up for if we take quality into account, for the work shows a very marked improvement, and this alone is a gratifying testimony of the activity and energy displayed by a few of the earnest workers in the Parent Society of Photography in Ireland.

In Class I. (Landscapes) the silver medal goes to R. M. Inglis for his set of four views, *A Rainy Day in Glen Rosa, N.B.*, being the most

worthy of notice (this view is also entered in Class VI., Enlargements). The bronze medal was awarded to A. E. Gordon for a set of views in Killarney, which is very creditable work for a young member of the Society, and deserves encouragement. Amongst others who exhibited in this class were Mr. J. A. C. Ruthven, who just escapes receiving an award for his set, which included *The Edge of the Wood*, *On Howth Hill*, *Giant's Causeway*, *After the Storm* (No. 4); Mr. J. Richardson's frame (No. 5); Mr. Strangways' (Nos. 16 and 17).

Class II. (Hand-camera Work).—A very strong class, both in number and quality, comprising no less than seventeen sets of six. In this class J. M. Keogh was awarded the silver medal for a set which showed a good deal of variety of style. The bronze medal went to R. M. Inglis for a series of very fine yachting studies. Other works in this class deserving mention are the snap-shots of yachts, by James Simpson; continental views, V. E. Smyth; the excellent results shown by A. M. Geddis, H. Goodwillie, and L. R. Strangways.

Class III., Figure Studies.—Here the silver medal was withheld, the competition was small, and not well up to the average. Mr. F. H. Orr was successful in taking the bronze medal for his set, a *Fair Musician* (which is, perhaps, the best in pose and treatment), *Afternoon Tea*, *My Family*, *May I Get Up?* The other exhibitors in this class are J. A. C. Ruthven, H. Goodwillie, and L. R. Strangways.

Class IV. (Cloud and Marine).—A small class, though very good. Silver medal, J. M. Keogh for a beautiful little set of pictures entitled, *Sea and Sky*. No less beautiful are those by R. M. Inglis entitled, *In Cloudland*, and which receive a bronze medal. *The Damaged Ship*, "*Wanderer*," by Joseph Kelsall, is a good specimen of photography, and is worthy of commendation.

Class V. (Historical and Archæological).—This class is also a small one, and surprisingly so considering the number of the members of the Society who take up this branch. Silver medal withheld. Bronze medal awarded to H. Goodwillie for his views of *Carnarvon Castle*, *Two Crosses at Clonmacuvise*, *Dean Odo's Doorway*, &c. An extra bronze medal goes to Joseph Kelsall for two views of *St. Germain*, *Peel Castle*, *Yellow Steeple*, *Trim*, *Cloisters*, *Moyne Abbey*, the best picture in the whole class. Also entered for competition are F. J. Richardson, J. M. Keogh, V. E. Smyth.

Class VI. (Enlargements).—In this branch R. M. Inglis proves himself an adept, especially in the work entitled, *A Rainy Day in Glen Rosa, Arran, N.B.*, which artistically and technically is fine. The values in this picture are exceedingly well rendered; it is most harmonious and quiet, bearing a glow of poetic feeling. In the distance over the mountain top it is teeming rain, the middle distance is bleak and lonely, and in the foreground stands a large rock beautifully lit and well rendered, which gives great power to the whole. This is one of the best things in the room, and fully merits the award bestowed by the Judge upon it. Following Mr. Inglis's views are the street scenes of Mr. Leonard K. Strangways, for which he takes the bronze medal. This gentleman is very happy in his selections of scenes and scraps illustrating low life as it is found in the back streets and slums of Dublin. His *Market Day in Nicholas-street*, No. 95, is a fetching bit. In this class are also to be found views by V. E. Smith, which, taking them as enlargements, are unsurpassed. No. 99, *Group of Italian Peasants*, is destroyed pictorially by a group of country folk standing in a line to be photographed. *St. John's Bridge, Kilkenny*, by the same gentleman, is a faultless composition. Good specimens of enlarging are those exhibited by F. H. Orr, *I See You* being about the best of the set.

Class VII. (Lantern Slides).—In this class there were the largest number of exhibitors, as many as 250 slides sent infor competition. The silver medal was awarded to J. M. Keogh for his set of six slides, J. A. C. Ruthven being the successful recipient of the bronze. Extra bronze, H. Goodwillie.

Class A (open competition, Landscapes).—This constituted a very small class, and in regard to work was much below the average. The gold medal the Judges withheld, a silver medal going to Charles Moss for his set, including *Sunset after Rain*, *After Sundown*, *Wind and Rain*, *A Break in the Clouds*. These prints were in carbon, and formed a good imitation of sepia drawing; the composition was good, with a fair amount of feeling, but they certainly lacked solidity and gradation of tone in all but the skies. The only other picture worth mention in this class is No. 42, by Mr. William Swanston.

Class B (Enlargements, open).—Silver medal, A. R. Dresser, for his enlargement, *St. Nelson*, a fine piece of work well deserving the honour bestowed on it. Special bronze awarded to Charles Moss for his two views similar in style to those mentioned above.

Class C (Lantern Slides, open).—Here the silver medal went to Algernon Brooker for a splendid set representing moonlight effect, Edgar G. Lee taking the bronze medal.

Besides these entries for competition a fairly good loan collection was got together, and includes works by Messrs. Cembrano, R. R. Levingstone, Meldon, Werner, Elliott & Son, Birt Acres (his well-known wave picture), Lawrence, Chancellor, Robinson, Jno. Griffith, &c., &c. During the time the Exhibition remains open very successful lantern shows with lecturettes are given every evening, slides being contributed by members, Messrs. Cembrano, Dresser, Welford, and others having also sent exquisite collections.

Our Editorial Table.

Fitch's Cut Film Developing Frame.

E. H. Fitch, Angell-road, Brixton.

This is a handy contrivance for use in the development of cut films, and at the same time for keeping them flat. It consists of a double-hinged frame, which is closed by means of catches, one half of it being rabbeted and cushioned with indiarubber. The film being placed in this, the frame is closed, and the film is held in a secure and flat position, and is consequently made to act as the bottom of the developing tray. Those who experience a difficulty in keeping cut films flat in an ordinary developing dish should find this contrivance useful.

The "Photogram."

The Photogram Company, Memorial Hall, E.C.

We have received the first number of *The Photogram*. In "get up" it reflects great credit on the Editors, Mr. and Mrs. Snowden Ward, the printing, paper, and illustrations alike being admirable. It is of convenient magazine size, and has a tasteful cover. Portraits and brief biographies of the Editors and the permanent staff, which includes Mr. Howard Farmer, Mr. C. W. Gamble, and Mr. W. T. Whitehead, are given, as well as much interesting matter of a technical nature. We wish *The Photogram* success.

Hinton's Scales and Weights.

We have received from Messrs. Hinton & Co., of Bedford-street, a neat box of small scales and weights, which is rendered complete and convenient by the attachment to the under surface of the lid of a series of printed tables of the four systems of weights most generally used, viz., troy, apothecaries', avoirdupois, and decimal. Messrs. Hinton inform us that these printed tables are now attached to all boxes of small scales and weights sold by them. They have taken the opportunity of asking us to put buyers upon their guard as to the accuracy of the weights supplied with commercial forms of small boxes of scales, and they have submitted for our inspection some weights imported into England from the Continent, which are actually irregular to the extent of twenty-five grains in two drachms, or five twenty-fourths of the indicated weight. Experimentalists are already exercised sufficiently in this happy land by the glorious confusion of our weights and measures, without the additional recreation which might result from the inaccuracy of a humorous manufacturer, who was himself evidently made either in France or Germany.

News and Notes.

Photographic Club.—January 31, Lantern and Musical Entertainment (Ladies' Night).

Putney Photographic Society.—February 5, *Stereoscopic Photography*, by Mr. T. Bedding.

Received.—*On the Product of the Action of Mercuric Chloride upon Metallic Silver*. By Chapman Jones.

Leeds Camera Club.—January 30, Demonstration: *Platinotype Printing*, by the Platinotype Company.

On Monday, January 29, the South London Photographic Society will hold a smoking concert at the Montpelier Hotel, Choumert-road, Peckham, at 8 p.m. Tickets may be obtained from the officers.

A great clearance sale is announced by Mr. Jonathan Fallowfield, Charing Cross-road, W.C., to make room for an influx of new stock. Bargains of apparatus and other things may doubtless be secured.

Messrs. Percy Lund & Co. inform us that Mr. Samuel Warren, hitherto their representative in the south and west of England, has been appointed to the management of their London business carried on at Memorial Hall, Ludgate-circus.

Messrs. Marion & Co., Soho-square, are issuing a series of six artistic photogravures, the subjects being photographed by W. & D. Downey. We have no doubt that they will conduce to the credit of all concerned. Artists' proofs, signed, are to be sold at 1*l.* 11*s.* 6*d.*; prints, at 15*s.* 6*d.*

To-night (Friday) January 26, Mr. Snowden Ward will deliver a lecture, *Ten Years among the Professionals*, at the Central Club, Coleman's Hotel, 13, Henrietta-street, Covent Garden, W.C., at 8 p.m. On the following Friday, Mr. J. H. Gear will give a demonstration of photogravure. Visitors are invited.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—February 1, *Mezzotype Paper*, by Mr. Robinson. 8, Lantern Night. 15, *Are Saturday Outings a Success?* by Mr. Bayston. March 1, the London and Provincial "Salon," Exhibition of Members' Pictures. 8, Annual Entertainment. Tickets are now ready.

EALING PHOTOGRAPHIC SOCIETY.—February 1, Members' Lantern Evening. 8, Technical: Compare Results of Summer Outing Work. 15, Paper—Subject to be announced. 22, *Enlarging*. March 1, Lantern Evening. 8, *Developers*. 15, *Flashlight*. 22, Lantern Evening for Trying Slides. 29, *Enlarging*. April 5, Lantern-slide Competition, 6 Slides, any subjects, for Medal, given by Mr. H. W. Peal. 12, Paper—Subject to be announced. 19, Exhibition. 26, Technical, *Re Outdoor Photography*.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—January 29, *Spotting Negatives and Prints*, by Mr. J. H. Avery. February, 13, Lantern Exhibition, by Mr. Birt Acres. 19, Lantern-slide Criticism. 26, *Amateur Platemaking*, by Mr. Child Bayley. March 12, *Print-out Processes*, by Mr. S. Herbert Fry. 19, *Gleanings from Picture Galleries*, by Mr. F. L. Pither. 28 (Wednesday), Members' Lantern Evening. April 9, *Failures*, by Mr. E. J. Wall. 16, *Hints on Selection of Subject*, by Mr. A. J. Golding. 23, *Clouds, Atmosphere, and Distance*, by Mr. C. Roland Whiting. May 14, Whit-Monday Outing. 21, *Clouds in Lantern Slides*, by Mr. S. E. Wall. 28, *Perspective and the Swing Back*, by Mr. J. McIntosh. June 11, *Architectural and General Interior Photography*, by Mr. J. H. Avery. 18, *Mounting and Framing*, by Mr. J. C. S. Mummery. 25, Technical Evening.

THE FALLOWFIELD SMOKING CONCERT.—On Thursday evening, January 18, the *employés* of Mr. J. Fallowfield, Charing Cross-road, held a smoking concert at the Swallow Assembly Rooms, Swallow-street, Piccadilly. The chair was occupied by Mr. H. J. White, the respected manager of the firm, and the room was thronged with a large number of ladies and gentlemen who had responded to the invitations of the committee. A long and diversified programme of vocal and instrumental music, interspersed with sketches, &c., was gone through to the great enjoyment of the company. The feature of the evening was the presentation to Mr. White, by the *employés* of the firm, of an illuminated address expressive of their esteem for him, accompanied by the good wishes of one and all, together with a handsome walking-stick. The presentation was made by Mr. Fellows, on behalf of his *confrères*, and Mr. White, who was greeted with cheers and musical honours, feelingly acknowledged the compliment. The Hon. Secretary of the concert was Mr. F. J. Goole.

LEEDS PHOTOGRAPHIC SOCIETY.—Syllabus, 1894: February 1, *The Hand Camera, with special reference to the Frena System* (illustrated), by F. O. Bynoe (Messrs. R. & J. Beck). 19, Social Evening Coffee, 7.30. President's Address and Prize Slides. March 1, Members' Lantern Evening. 19, *Bromide Printing: Variations by the use of Different Developers*, by Mr. J. H. Walker, President. April 5, *Criticism of Lantern Slides from an Artistic Standpoint*, by an Artist. 16, *Choice and use of Apparatus*, a discussion intended to be of interest to beginners. May 3, *Development*, elementary instruction, by Mr. S. A. Warburton. 21, Members' Lantern Evening. June 7, *Carbon Printing*, a demonstration, by Mr. Herbert Denison. 18, *Printing*: Silver, by Mr. Godfrey Bingley; Platinum, by Mr. T. W. Thornton. September 6, *The Use of the Lantern as an Educational Instrument* (illustrated), by Mr. Washington Teasdale. 17, *Architectural Studies in Normandy* (illustrated), by Dr. E. H. Jacob, M.A. October 4, *Flashlight Photography*, by Mr. J. H. Walker. 18 (Thursday), *Composition and Chiaroscuro* (illustrated), by Mr. Edward Renard (Leeds Academy of Painting). November 8, *New Printing Processes*, by Mr. B. A. Burrell. 19. *Lantern Slide-making by Reduction*, by Mr. Godfrey Bingley. December 6, Annual Meeting and Members' Lantern Evening. 17, *New Lantern Slides*, by Mr. Godfrey Bingley.

CROYDON CAMERA CLUB LANTERN SHOW.—January 17, Mr. Hector Maclean, F.G.S. (president of the Club), in the chair.—Mr. JOHN A. HODGES gave his lecture, *A Ramble in Lakeland*. Probably ninety-five per cent. of those who do the English Lakes never see a quarter of what Mr. Hodges showed the audience, which all resulted from a three weeks' tour he took during the last autumn, when he employed his camera with such telling effect as to come away with, figuratively, the whole district in his bag. It would be impossible, however agreeable or profitable, to give any adequate *résumé* of the many charming views or telling anecdotes which the lecturer treated his audience to. Enough that all the best-looking lakes and rills, cascades and "gills," all the picturesque fells and falls, hills and gorges, were shown, besides which many views of ruined abbeys and other ancient edifices were brought to view; also some cloud scenes, two of which obtained special and sustained applause. The interval was agreeably filled by a performance of Van Bree's cantata, *St. Cecilia's Day*, by the Birdhurst Glee Society. The second part was composed of members' slides. Of these, chief interest centred in those contributed by Messrs. G. Carden and A. E. Isaacs, the former gentleman's snapshots of sliding, skating, and tobogganing being specially good. Messrs. C. F. Oakley, J. Smith, Frost, and Hirst, also exhibited. The lantern was worked by Mr. G. R. Wint with his usual ability.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 919.—"Improvements in and relating to the Embossing of Photographic or other Prints and Designs." A. HART.—*Dated January*, 1894.

No. 1023.—"Photographic Printing Frame." D. GRAAB.—*Dated January*, 1894.

No. 1024.—"Improvements in Chamber Jets for Oxyhydrogen Limelight Effects." Complete specification. B. J. MALDEN.—*Dated January*, 1894.

No. 1109.—"Improvements in and connected with Lighting Apparatus for taking Photographs at Night or in dull Weather." T. MALONI.—*Dated January*, 1894.

No. 1216.—"Improvements Connected with Magic Lanterns and other Apparatus for Optical Illusions." R. W. PERRY.—*Dated January*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 29	Camera Club	Charing Cross-road, W.C.
„ 29	Richmond	Greyhound Hotel, George-street.
„ 30	Birmingham Photo. Society	Club Room, Colonnade Hotel.
„ 30	Hackney	206, Mare-street, Hackney.
„ 30	Halifax Camera Club	Club Rooms, 12A, Crossley-street.
„ 30	Lancaster	Society's Rooms, Stonewell.
„ 30	Leith (Annual)	165, Constitution-street, Leith.
„ 30	Paisley	9, Gauze-street, Paisley.
„ 30	Rochester	Mathematical School, Rochester.
„ 30	Warrington	Museum, Bold-street, Warrington.
„ 31	Bath	Roy. Lit. & Sc. Inst., Terrace-walks.
„ 31	Burnley	Bank Chambers, Hargreaves-street.
„ 31	Leytonstone	The Assembly Rooms, High-road.
„ 31	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
„ 31	Southport	The Studio, 15, Cambridge-arcade.
February 1	Birmingham Photo. Society	Club Room, Colonnade Hotel.
„ 1	Camera Club	Charing Cross-road, W.C.
„ 1	Dundee and East of Scotland	Lamb's Hotel, Dundee.
„ 1	Glasgow Photo. Association	Philoso. Soc. Rooms, 207, Bath-st.
„ 1	Glossop Dale	Norfolk-square, Glossop.
„ 1	Hull	71, Prospect-street, Hull.
„ 1	Leeds Photo. Society	Mechanics' Institute, Leeds.
„ 1	London and Provincial	Champion Hotel, 15, Aldersgate-st.
„ 1	Oldham	The Lyceum, Union-st., Oldham.
„ 1	Tunbridge Wells	Mechanics' Inst., Tunbridge Wells.
„ 2	Brighton and Sussex	Librarian's Room, Public Library.
„ 2	Cardiff	Castle Arcade, Cardiff.
„ 2	Central Photographic Club	Coleman's Hotel, Henrietta-st., W.C.
„ 2	Croydon Microscopical	Public Hall, George-street, Croydon
„ 2	Holborn	100, High Holborn, London, W.C.
„ 2	Leamington	Pump Room, Leamington.
„ 2	Maidstone	"The Palace," Maidstone.
„ 2	North Kent	Gravesend.
„ 3	Hull	71 Prospect-street, Hull.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JANUARY 23,—Technical Meeting, Mr. J. W. Swan in the chair.

The evening was devoted to a discussion of lantern-slide processes, a report of which we defer.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 11,—Mr. E. H. Bayston in the chair.

Mr. HOWSON, of the Britannia Works Company, sent down, as desired, prints upon the new matt P.O.P. and on the ordinary glossy paper, for comparison, as to loss of detail, from the same negatives. The results were very nearly alike, but the meeting generally considered that the glossy paper had a trifling advantage, Messrs. Debenham, Everitt, and the Chairman contributing to the discussion.

The CHAIRMAN passed round a print, as his first attempt upon the matt P.O.P.

Some conversation upon the carriage and safety of gas cylinders took place, after which the lantern, being ready for the usual monthly evening, slides were shown by Messrs. Freshwater and Austin.

JANUARY 18, Mr. R. Beckett in the chair.

Mr. EVERITT asked what was the most suitable hand camera to take to Canada, having reference to the coldness of the climate? A macintosh shutter was not desirable.

Mr. HODD said that, excepting the blind shutter, there were several suitable ones on the market. He advised draw-out shutters to the slides, and would show his own camera on a future evening. A useful focus for a quarter-plate he considered was five and a half inches, with adjustable focus.

The CHAIRMAN asked for experiences of the Thornton-Pickard shutter in cold weather. He should think there was too little indiarubber on the cloth to be much affected.

GAS CYLINDERS.

Referring to the conversation last week upon the safety, &c., of gas cylinders, Mr. ATKINS, thinking that it might be useful to the members to know how calculations of this kind were made, worked out on the blackboard an example of a cylinder seven inches diameter, of a supposed thickness of a quarter of an inch, and made of steel, having an ultimate strength of twenty-nine tons per square inch of section. He did not put forth these figures as actual ones, but merely for the sake of illustration. At the ordinary charging pressure of 120 atmospheres—say, 1800 pounds per square inch—such a cylinder would burst at about two and a half times its charging pressure—too low a factor of safety.

Rule.—1st. Multiply the internal diameter in inches by the pressure per square inch (this gives the actual bursting force exerted upon any given diameter).

2nd. Multiply the tensile strength in *pounds* by double the thickness in inches (this is the ultimate resisting strength). Taking the latter result, and dividing it by the former, we arrive at the factor of safety thus :—

$$7 \times 1800 = 12600.$$
$$29 \times 2240 \times 2 \times \tfrac{1}{4}'' = 32480.$$
$$32480 \div 12600 = 2{\cdot}57.$$

These figures give the same result as those on the blackboard, but the ultimate strength *per square inch* (64960 pounds) was then taken. Mr. Atkins gives the above as more simple.

Brin's Oxygen Company presented a copy of their *Handbook on Compressed Oxygen*, &c., and were duly thanked.

The London and Provincial "Salon."

It having been decided to have a "Salon" Evening occasionally for the exhibition of members' pictures, and a proposal having been made by Mr. Cowan, seconded by Mr. Haddon, that it should take place at the Central Club, it was subsequently withdrawn in favour of Mr. Child Bayley's motion, seconded by Mr. Debenham, to arrange for it at the Association's rooms, March 1 being the day fixed.

The Photo-autocopyist.

Mr. Taylor gave his demonstration of the Photo-autocopyist, which he said had been improved since Mr. Warnecke showed it about three years ago. Mr. Taylor's assistant commended the process as being a permanent one, and printable in any colour. There was an idea about that it was troublesome to obtain good results. The apparatus was simple, and the ordinary copying press was used for pulling the impression. He hoped to satisfy the meeting as to quality of results. Gelatinised parchmentised paper was sensitised on a bichromate bath about three minutes, and squeegeed on to talced glass and dried, then stripped and printed in the usual manner. The back was exposed to light, say, five minutes, to harden the film and reduce the subsequent relief. Soaked in water to remove the bichromate, it was treated to a softening solution of—

Glycerine	24½ ounces.
Water	10½ ,,
Liq. ammoniæ	$\frac{1}{15}$ pint.

This acted for half an hour for ordinary contrasts, but a shorter time where there were dark shadows. Placed on a block (wood, felt, and zinc) in stretching frame, it was inked up with a composition roller, and impressions pulled on the press. By rights a reversed negative should be used, but for some subjects, such as landscapes, it did not matter much. In first inking up, it was advisible to err on the side of too little ink, as more could be added. Slow rolling caused more ink to stick on, but quick action removed it. A clean edge was made by placing strips of paper on the edges of the film. An impression might be "burnished" by rubbing over with French chalk.

In answer to Mr. Teape,

Mr. Taylor said that faults could only be remedied on the negative, not on the film.

Mr. Truscott asked whether a roller improved by use?

Mr. Taylor said that there was no material difference, the next print would be rolled up with a new roller. Three hundred to four hundred copies could be got from one surface. It could be put away dry, damped when wanted, and used again.

Mr. Haddon mentioned that Mr. Warnerke had laid stress upon the use of two stiffnesses of ink.

Mr. Taylor also used two inks where contrasts where strong.

In answer to Mr. Debenham, as to improvements since Mr. Warnerke showed the process.

Mr. Taylor said that materials, notably the gelatinised sheets, had been improved, otherwise it was much the same. In reply also to Mr. Debenham, he said that five minutes' exposure at the back was about right for dull light; the longer the exposure the less the swelling. In printing the time was about three to four times that of silver. The image could be seen in all its details when complete.

After a vote of thanks to Mr. Taylor, the meeting terminated.

PHOTOGRAPHIC CLUB.

January 17,—Mr. John Howson in the chair.

Backing Plates.

Mr. J. Weir Brown asked how thick a backing should be to be effective?

Mr. F. A. Bridge thought it was immaterial how thick the backing was so long as the glass was covered. In reply to a question from the Chairman, he said good caramel could be obtained from Hill's, Southwark-street.

Rough Paper.

Mr. James A. Sinclair introduced the subject by remarking that he had used Fry's Naturalistic bromide paper, Rudowsky's, and the extra rough sepia platinum paper. For the latter the negative must be thin.

Mr. Robinson (of the Carlotype Company), a visitor, said the paper which his firm produced was plain salted, without gelatine. Black tones were obtainable upon it, and the paper kept well. He showed a number of prints having tones ranging from warm red to cold black, and said that the paper employed could be guaranteed pure and to contain no metallic spots.

Mr. Weir Brown did not like white paper for warm tones, but preferred it "toned" like Fry's Naturalistic paper. He had used a coffee bath for white papers after uranium toning.

Mr. Bridge asked if pure whites could be obtained on the Carlotype paper?

Mr. E. W. Parfitt had used the paper and liked it. He got pure whites upon it.

Mr. Weir Brown had found it keep well for two months.

Mr. Robinson thought it printed quicker than albumenised paper.

Mr. Frank Haes inquired what was the advantage of a rough paper?

Mr. Weir Brown replied that with it some negatives gave a better result than on glossy paper.

Mr. Haes thought it broke up the heavy shadows more than the glossy paper did.

Mr. J. R. Gotz was of opinion that the use of rough papers for the imitation of painters' effects was a great mistake. Photography should stand by itself.

Mr. Weir Brown said that photography was a means to an end. An artistic photograph should convey the impression conveyed to the eye. A general impression was required to get a picture. Broad effects were often effective, even on a quarter-plate. Rough paper was specially suitable for rendering broad effects of light and shade.

Mr. J. Nesbit did not approve of the submerging of detail with rough papers. One could *see* detail in the original subject; therefore, why should not detail be shown in the photograph?

Mr. Bridge thought that the detail in a good photograph ought not to be obtrusive; if looked for, it was there. Was it the fact that artists were including more detail in their paintings in consequence of the influence of photography? He thought they were.

Mr. R. Child Bayley said it depended on the negative if the roughness of the paper were noticed.

Mr. Weir Brown said that Carlotype paper would give detail if it were in the negative.

The Chairman, on the other hand, thought that rough paper must destroy detail.

Mr. W. I. Chadwick, a visitor, was of opinion that detail ought to be given, and that it should not be necessary to look for it.

The Chairman, in concluding the discussion, thought that painters aimed at producing detail, but it was all a matter of taste in photography. The majority of photographers went in for detail. With warm tones it was advisable to have tinted skies, but a black print must have a white sky.

Hackney Photographic Society.—January 16, Mr. T. H. Smith in the chair.—Prints on the new Ilford matt P. O. P. were shown by Messrs. Grant, A. Barker, and Newton. In answer to an inquiry for a dead black varnish, various formulæ were recommended, chief of which being vegetable black mixed with any one of the following media—gold size, ordinary size, diluted glue, and French polish. The feature of the evening was the exhibition of lantern slides by Messrs. Birt Acres and J. B. B. Wellington. These gentlemen were unfortunately prevented from attending the meeting, but sent a number of very fine slides which were much admired. Among others, some of Messrs. Acres' and Wellington's medalled pictures were shown. Members' slides were shown by Messrs. Carpenter, Gosling, Guest, Hull, and Fenton Jones.

Thursday, the 18th inst., witnessed the inauguration of what will probably become an annual event in this Society, viz., a Children's Night. Members' children, to the number of about sixty, were entertained with an exhibition of lantern slides. Such old and well-known favourites as the *Elephant and Tailor*, *Diogenes and his Tub*, chromatropes, &c., among others were heartily received. The refreshments in the shape of sweets, cakes, and other good things which had been provided, were also much appreciated by the juvenile guests. At the conclusion of the entertainment, by the kindness of two members, Messrs. Ancell and Featherstone, who had presented toys for the purpose, each child had a small gift as a souvenir of the evening's amusement.

North Middlesex Photographic Society.—January 22.—Mr. Walter D. Welford, the editor of the *Photographic Review of Reviews*, read a paper entitled *Some Points connected with Hand-camera Work*. The title is a somewhat comprehensive one, and can be made to include almost anything, so long as it has a bearing on hand cameras. He contended that the hand camera was not, as was considered by many people, a toy, but was a piece of practical apparatus for special work. It was not intended to oust the ordinary camera, but was used for work for which the ordinary camera was not so suitable. Its great and inherent attribute was usefulness. The taunt was thrown at hand-camera workers that their results were not artistic, but were mere maps; but, properly used, it would register and preserve records of our joys and sorrows, incidents of humour and pathos, results which will live and be precious when mere art studies shall have vanished, or been changed by fashion. He thought too much thought and skill were being concentrated upon the means of changing the plates or films, and other details were being neglected. Finders, for instance, were much neglected; the ordinary finder, placed near the surface of the box was of very little use, as the image could not be seen in a bright light. Why were they not sunk, so as to make the image visible? He thought the type of hand camera for the future would be one that would carry a fair number of cut films of any make without the need of cutting, or other devices, so that it could be refilled anywhere. Films must be made more rapid and more reliable. But, after all, more important than the type of camera, or method of changing, was the man who used it, for the worker himself was most often overlooked in the praise or blame of the instrument. A good worker would do good work with *any* camera, a bad worker with none.

Putney Photographic Society.—January 18, Dr. W. J. Sheppard in the chair.—Mr. W. D. Welford gave a lecture on *Hand-camera Work*, and showed a fine collection of lantern slides taken from hand-camera negatives. The Chairman, in introducing Mr. Welford, said that most of the members present had, on a previous occasion, had the advantage of hearing his interesting and instructive lecture on *Hand Cameras*; it would therefore now be doubly interesting to them to see specimens of work done with such cameras. Mr. Welford, in the course of a short introductory lecture, said that, broadly, hand cameras might be divided into two classes, viz., those fitted with some kind of magazine, and those fitted with ordinary or special forms of double or single dark slides; both classes had their special advantages, and in selecting a camera due consideration should be given to the kind of work for which it would be chiefly used. The camera should be unobtrusive in appearance; this was particularly desirable when taking figure studies, street scenes,

&c. It should be fitted with good finders, which should be well sunk, so that a good image might at all times be seen without difficulty. A brief reference was made to the ingenious universal cameras, which could be used on the hand, and also as an "ordinary" camera. They had all the movements of the "ordinary," such as focussing, swing back, rising fronts, &c. He thought, however, that it was, on the whole, best to have two separate cameras, one for hand, and one for stand work. He was not in favour of the swing back for hand cameras, or, rather, could see no object in it to compensate for the additional bulk and weight incurred in its introduction. It was necessary to stop down the lens very considerably when using the swing; this again necessitated a prolonged exposure, during which it would generally be found impossible to hold the camera steady. In a hand camera a good lens was of even greater importance than for an "ordinary" camera for stand work, when the lens could nearly always be worked at a comparatively small aperture. Another important point to bear in mind was that the lens and finders should be so arranged that they could be readily got at for cleaning. Dust would be found to accumulate much more rapidly than in the ordinary camera, if for no other reason, at least because the hand camera was carried about so much more; unfortunately, the design had also not infrequently a good deal to do with the aggravation of this evil. It is obvious, then, that there should be ready access to all parts, so that they can be thoroughly cleaned and dusted when required. Mr. Welford then proceeded to show his fine collection of lantern slides from his own hand-camera negatives, all of which were taken with the camera actually held in the hand; they amply proved that work of artistic and technical excellence can be done with good apparatus intelligently used. He pointed out the lessons to be learned from the slides as they were shown on the screen, and particularly advocated a judicious blocking-out. In figure studies he proved his point by showing slides from the same negatives, blocked out and printed full, the advantage of the former being very obvious. The slides were grouped according to subject, and in this connexion should be mentioned Mr. Welford's admirable system of marking lantern slides, by which he was able to find immediately, and with certainty, any one slide in a box containing several hundreds. The description of the slides was given in an admirably crisp and entertaining manner, and was frequently further enlivened by amusing anecdotes well told, showing that Mr. Welford is not only a distinguished hand-camera worker, but also an excellent *raconteur*. It is almost superfluous to state that the large audience spent a most enjoyable evening. Messrs. Cadett & Neal had sent a parcel of their new lantern plates for trial; they were distributed among the members, who promised to record their experience at the next meeting.

South London Photographic Society.—January 15, the President (Mr F. W. Edwards) in the chair.—There was a large attendance of members. Mr. C. L. Burdick, of Chicago, gave a demonstration of the use of his improved air brush in working up in black and white. The tool can, if desired, be used for water colours, being cleaned in the course of a minute by blowing water through it. One or two of the gentlemen present tried their skill with this "brush." Mr. JOHN HOWSON followed with a demonstration of the working matt-surface P.O.P., and brought some fine specimens of prints on that paper by many well-known photographers, to whom samples had been sent for trial. He proceeded to tone a considerable number of prints, the toning bath being the usual Ilford formula for P.O.P. He stated it was not necessary to exercise so much care with the new paper as in the case of glazed P.O.P., because the gelatine was placed direct on to the paper, which had not been chemically prepared for its reception, and on this account the gelatine was not so liable to crack. In the case of large prints, they could be folded, if required, when toning, and no harm would accrue. He advised the members to keep their sulphocyanide of ammonium in solution. He himself made it up in the proportion of 120 grains to the ounce. Matt paper can be toned at the same time as the other paper, and the tones obtainable ranged from brown to black as the worker desired.

West London Photographic Society.—January 16.—Messrs. C. WHITING and H. DOVASTON read a joint paper on *Stereography*. After referring to the discoveries of Professor Wheatstone on the subject of binocular vision, the lecturers explained that solid bodies presented different images on each retina, the well-known experiment of regarding the raised finger with alternate eye, and noting its apparent positions in relation to more distant objects, being instanced. In stereoscopic pictures the same relations must hold, *i.e.*, the foreground objects in the two pictures must cover different points in the receding planes. The idea of solidity was given by the convergence of the optic axes, whilst the two retinal images coalesced into a single picture in the brain, owing to the images occupying similar positions on the retinæ, any displacement of one, such as might be produced by pressing the eye with the finger, immediately produced a double picture. By the use of a cleverly constructed diagram, the lecturers showed that the position of an object was referred to the point where the optic axes intersect; thus an object might appear before or behind its actual position, according to the amount of convergence the eyes might have at the time. In 1839 Wheatstone brought out his reflecting stereoscope, which had the advantage that the pictures were not limited in size. This was followed by the refracting stereoscope of Sir D. Brewster, in which lenticular prisms were used to obtain the necessary optical conditions. The lecturers showed diagrams of the method of using a camera with a single lens only for producing stereoscopic negatives, and of using a two-lens camera so as to obtain the negatives reversed in position, and thus correctly placed for printing; also a diagram of a frame for printing transparencies to avoid cutting and transposing. The subjects selected should have plenty of foreground, and the prints should be soft, with the whites toned down. Winter was a favourable time for getting good stereoscopic pictures.

Bath Photographic Society.—January 5, Mr. Austin King in the chair, and the audience was so large that the tea tables were crowded out into the reading-room. Round the walls were a selection of the work of the members during the past year, which included some very high-class portraiture and landscape. There was also a small collection of the results of the new chromo-collotype process. These are pictures in colour produced by the aid of photography, and some of them were of extreme beauty. The programme commenced with a short account by Dr. NORMAN of a series of photo-micrographs. Some insects were shown on the screen of a size of twelve feet in diameter, and Dr. Norman dwelt on the great importance of the combined results of the camera and the microscope for purposes of tuition and accurate observation. The specimens shown were kindly lent by Mr. Pumphrey. Mr. PUMPHREY then shortly explained the theory of photographic enlargement, and gave a demonstration of practical enlarging from a small negative to twelve by fifteen inches. The resulting prints were developed and, later in the evening, handed round for inspection. Mr. George Powell and Mr. Pumphrey concluded the "before tea" entertainment by taking a couple of "flashlight" photographs of the Laocoon group. After tea the PRESIDENT gave a short address on *Photography in Natural Colours*. This had ever been the dream of photographers, and as far back as 1818 an advertisement had appeared in *Bell's Messenger* notifying the taking of likeness in colour in two minutes by a "patent machine." The lecturer first dealt with the inaccuracy of ordinary photographic plates in translating the relative luminosity of colours into monochrome. Yellow was the most luminous of all colours, and yet yellows and red (even of the brightest hues) came out almost black in a photograph, whilst dark blue and violet appeared nearly white. This was because all the rays of a beam of light are not of the same chemical value. Mr. Edwards's Isochromatic plates corrected this untruthfulness, and their value was demonstrated by a series of examples of photographs of vases of flowers taken upon these and upon ordinary plates. At the request of the lecturer, Mr. BLIGH BOND, of Bristol, who was one of the earliest and most successful workers in the chromo-collotype process, gave a short account of that process. It is, in fact, a process of chromo-lithography, but the three blocks from which the pictures are "built up" are produced by photography. Three negatives are obtained of the subject. The first is so coated as to be sensitive only to yellow rays, the second to blue, the third to red. The successive printing from blocks made from these negatives produces the finished picture. A fine specimen of printing in colours by the carbon process was lent for the occasion by Elliott & Son, of Barnet. Mr. KING went on to deal shortly with the process of printing in really natural colours, invented by M. Lippmann, of Paris, and rendered more practical by Lumière, of Lyons. This is not like ordinary photography—a chemical process—it is really a physical one. The plate is, during exposure, kept in contact with metallic mercury, and the subject is projected on to it through the glass backing. The result is that the rays of light are reflected back upon each other, and this "interference" in the thickness of the sensitised films causes, in some instances, intensified, in others diminished, action. The different rays have different powers of penetration, and the colour depends upon this phenomenon. A familiar illustration is to be found in the iridescence where shown by mother-of-pearl. Specimens have been shown in London, but considerable divergence of opinion exists as to the truth to nature of the resembling colours. The difficulty seems to have been not only to get an emulsion which is sensitive to all the colours of the spectrum, but to get also an emulsion which will render the luminous value of each of the colours. At present there is much that is doubtful, much that is speculative, much even that is mysterious about the process, but there was now real reason to hope that, before another year had passed, photography in natural colours would have been achieved as a practical process. It would be difficult to overrate the importance of such a discovery to the artistic and scientific world. The entertainment was brought to a close by the exhibition on the screen of some admirable lantern slides, the work of Meesrs. Powell, Peacock, Perren, Ashman, Appleby, Pumphrey, Colonel Sealey, and the President.

Birmingham Photographic Society.—January 16, 1894, Mr. W. Jones in the chair.—There were about seventy members and visitors present, including several ladies, to hear a lecture by the President, Sir J. B. Stone, upon a recent journey to Brazil and the West Indies, illustrated by a collection of lantern slides of a varied series of the subjects to be met with by an observant traveller. The President described, by reference to a map thrown upon the screen, the journey taken, which was by way of the Canary and Cape Verd Islands, Pernambuco, and several other places of interest on the Brazilian coast, the Amazons, Trinidad, Barbadoes, and the West Indies generally. He took his audience through a narrative of the voyage, describing and illustrating by slides, immigrant life and character of the Spanish and Portuguese on board ship, the forms of seaweed and crustaceæ, of the Saragossa Sea, the Equatorial cloud belt, the Gulf Stream, surf waves of the Brazilian coast, and many other objects of interest incidental to a voyage to the Equator. The most notable feature of the lecture was the President's description of his journey of sixty miles through the Brazilian forest to an inland station, with a number of other scientific gentlemen, for the purpose of taking observations of the Eclipse of the Sun, the particulars of which were most successfully recorded by a series of photographs of valuable interest and instruction, some of which were put through the lantern. The descriptions given of the vastly fertile resources of Brazil, the industries and commercial habits of its inhabitants, their political character and predilection for revolution, their methods of deposing those in authority or office, and of playing at politics generally, were received by the audience with much interest and amusement, especially as the President brightened the account of his observations and experiences by humorous anecdotes and illustrations.

Derby Photographic Society.—January 17, Annual Meeting, Mr. G. H. Grundey occupying the chair.—The Hon. Secretary then submitted the annual report and balance-sheet for 1893, which stated that good work had been done by the Society. The meetings had been well attended, and the Exhibition held at the beginning of the year was a great success. There was also a substantial balance at the bankers'. The Society has again become affiliated to the Photographic Society of Great Britain, a step which will, no doubt, prove beneficial. The report and balance-sheet were unanimously adopted. Two new members were elected, Messrs. W. R. Bland and R. Fearn. It was decided to hold a lantern exhibition on Friday, February 23, to which the public will be invited by invitation tickets.—Mr. W. MORRIS was then called upon to give a paper on *Stereoscopic Photography*, and also showed the easiest method of converting

an ordinary camera into use for this class of work. He strongly advised photographers to take up this subject, as being a very interesting way of showing photographs to perfection.

FORTHCOMING EXHIBITIONS.

1894.	
January 26–29.....	*Photographic Society of Ireland. Hon. Secretary, J. A. C. Ruthven, 35, Dawson-street, Dublin.
February 6	Durham Camera Club. Hon. Secretary, R. Hauxwell, The Avenue, Durham.
,, 8-10	Woolwich Photographic Society. Hon. Secretary, W. Dawes, 145, Chestnut-road, Plumstead, S.E.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

MATT PAPER.

To the EDITOR.

SIR,—I read with interest and some surprise the praises of the new matt-surface paper by the Ilford Company, "Nothing of the kind has ever been made before, and the future offers nothing that can equal it."

These are, amongst others, the words with which this paper was boomed at the "Central Club."

Allow me simply to point out to your readers the matt-surface paper coated with Obernetter's emulsion has been on the English market these three or four years.

It may be remembered that, some four years ago, I showed some prints on it at the City Drapers' Hall Exhibition, and that hundreds of prints have since become public, and reams of the paper have been sold to the cream of the professional and amateur communities.

At a technical meeting of the Photographic Society of Great Britain, some two years ago, I demonstrated printing and toning of this matt-surface paper, pointing out that there was nothing new in chloride printing-out papers, which had, in fact, been introduced by me some five or six years previously—in 1885.

Mr. Howson, who demonstrated on behalf of the Ilford Company, showed P.O.P. which was neither novel nor professed any prominent qualities which were not in a higher degree present in the then well-known and popular papers of the Obernetter type.

I quote again from the reports of the photographic press:—"I have had so-called matt emulsion papers which have had the fatal failing of clogged shadows, and had not, in fact, a real matt surface at all, being made simply by making the emulsion thinner than usual," &c.

This statement, I take it, is not intended to apply to "Obernetter paper;" for I can hardly imagine a man in the position of Mr. Howson knowingly making such a mis-statement to a body of gentlemen such as those of the Central Photographic Club.

The thinning down of the emulsion is not a thing of which the makers of the Obernetter paper have ever been guilty; and, as for the clogged shadows, I have numerous prints of my own doing, and others given me by many who have worked the paper, which are remarkable for the absence of clogged shadows, and yet they are on *Obernetter matt-surface emulsion paper!*—I am, yours, &c., J. R. GOTZ.

150, *Shaflesbury-avenue W.C., January* 16, 1894.

PINHOLES: BLISTERS.

To the EDITOR.

SIR,—Some time ago you wrote about pinholes in negatives, as resulting from dust and carelessness from the manipulator, exonerating fully the manufacturer. Again, in your last number, the Dresden Albumenising Company say how parties using their paper can avoid blisters, which, after all, seems to be due solely to the user, but never to he manufacturer.

If you will kindly allow me a few minutes' attention, I will tell you, first, about pinholes. It is a well-admitted fact that the manufacturer is never to blame, and see how pleasantly and innocently he smiles when he says, in his astonishment, "Why, my dear sir, I never heard of that defect before Quite curious! You are the first one. Did you dust your plates, your hold rs, your camera lens, focussing cloth, tripod, filter your solutions?" &c. It is seldom when one or the other has not been overlooked, and then: "You see, it must be the reason of these pinholes," &c.

Now, Mr. Editor, I have been there myself, which means I used to manufacture dry plates myself with collodion emulsion; and, curious as it may seem to you, I could make, at that time, dry plates *with* pinholes, and *without* pinholes, by just altering the proportions of some chemicals, and it goes without saying that I did, at last, solely those *without*. But at the start I had the pinhole trouble rather hard on me, which did not in the least prevent me from saying, as above, "*Dust, my dear sir, dust!*" I am so convinced of this fact that, up to date, I have not dusted myself a single plate before using, nor before developing, and, however I may have had an occasional dust speck, it has not interfered with the picture. Dust which gives perfectly transparent spots, or lines more or less straight, is not that kind of dust that flies around, and is liable to settle much on a plate while handling for one or two minutes for transferring from package to plateholder. So much for dust.

Now for albumen paper and blisters. If you only take all the trouble, and care, and expense necessary to prevent blisters, you are perfectly safe, and you can see that the manufacturer is not in the least to blame. The best proof of it, as the manufacturer will tell you, that he will give you, for some time, albumen paper which will not blister, do what you will, and you can even go contrary to all rules; while at other times, do what you like, it will blister, and the cures given out for the prevention are legion, and only one sure—"alcohol"—but it is expensive, and leaves a scum on the picture. Here is my experience, and probably that of many others using single albumen only. I have used paper, and am using some now, pouring hot and almost boiling water into the washing tanks full of ice-cold water and prints, the warm water falling forcibly very uneven on the prints, and yet not a single blister. This after fixing.

At present I have no precautions to take, as I have no blisters; but about a year ago I had plenty of them, and, as I said before, "alcohol" was the only remedy I found to be sure. I tried (always on single albumen paper) the ammonia in the hypo bath, and had just as many blisters as before. I have also tried salt once; but what was the use, the blisters always appearing in the hypo, and very little more in the after-washings?

To couclude, I would say that, considering that manufacturers of albumen paper do give occasionally lots of non-blistering paper, and then some blistering ones, the trouble starts in their factories, and should be cured there, and not by after-remedies in the photographer's studio.—I am, yours, &c., A. LEVY.

Asnières, January 22, 1894.

THE SPEED OF PLATES: A CRITICISM AND A REPLY.

To the EDITOR.

SIR,—We have no desire to prolong the discussion between Mr. Elder and ourselves; and the purpose of this letter is simply to guard against Mr. Elder's worthless definition of a perfect negative being mistaken for our own.

Mr. Elder distinctly stated in his paper, and not in his footnote, that the tangent to the point of inflexion to Captain Abney's curve satisfied our criterion of a perfect negative; and it is evidently not consistent with his scientific honesty to correct such an error in such clear language that the public at large may understand the correction. We, as well as your readers, must therefore be satisfied with Mr. Elder's cloaked admission that the whole of the "law of error" curve, and the tangent to its point of inflexion do *not* conform to our criterion. Captain Abney himself says that our criterion of a perfect negative is "almost self-evident," and it can be shown to be so, even to non-mathematical readers, by means of models. Until Mr. Elder has shown that his new criterion of a perfect negative is self-evident, either by clear reasoning, or by experiment, we shall take no further notice of it, having now warned our readers not to confound the two.

Mr. Elder regrets that we again referred to Captain Abney's attempt to prove that his formula does not differ much from ours, it being admitted that the one represents a parabola, and the other a straight line. Our regret is that so great an authority as Captain Abney should have attempted so absurd a proof by so absurd a method, and that Mr. Elder, by his persistent justification, compels us to dwell upon so obvious a fallacy.—We are, yours, &c., F. HURTER AND V. C. DRIFFIELD.

Widnes, January 23, 1894.

COMPRESSED GAS CYLINDERS.

To the EDITOR.

SIR,—It appears that Mr. Chadwick is not satisfied with my reply to his letter. I am sorry. I endeavoured to meet him fairly, and am told by several people, whose opinion I value, that I did so. Of course, if he chooses to state that I shirked replying to something which he did not say, or only intended to say, I cannot help it. If he will read again his letter and my reply in connexion with each other, and not set his recollection of the one against his recollection of the other, I think he will see what I mean. I begin to think that Mr. Chadwick is loth to part with his bogies of overcharging and adapter connexions. I know he has

nursed them a long time. Nobody has been frightened by them so far as I know, so perhaps it is not worth while to try any further to convince him that they are only stuffed with sawdust.

If nothing will satisfy a man but the rendering absolutely impossible of a wilful error or a breach of rules on the part of a workman, then that man is doomed to chronic discontent. In the compressing of gases, as in other operations needing care, we may devise perfect rules and safeguards, but we have to rely ultimately on the men who are set to observe them. If they are men of suitable experience and character, we have got all the guarantees of security which are obtainable or even necessary.

I may say, sir, that, when I replied to Mr. Chadwick's first letter, I did not know he was referring specially to the practice of the Company with which I am connected. He mentioned no Company in particular, so I understood his remarks to be general, and I replied to them generally and unofficially. Mr. Chadwick is incorrect in saying that I am the manager of the Manchester Oxygen Company. If he has any charges of serious irregularity to make against any of the Compressing Companies, and will put them in concrete form—not as mere *ipse dixits* and insinuations—I have no doubt they will be properly dealt with. My object in writing was not to defend any Company in particular, but to point out what I considered to be reckless and misleading statements, or statements made in a reckless and misleading manner, with the apparent purpose of creating a scare, and with a tendency to obscure the real questions of importance raised by the Bradford accident. These questions are still under discussion, and I am sanguine that decisions will be arrived at which will place the compressed-gas industry on a more satisfactory basis.—I am, yours, &c., W. Morton Jackson.

Manchester, January 22, 1894.

PHOTOGRAPHIC COPYRIGHT.

To the Editor.

Sir,—May I be permitted to say that Mr. Beaufort's suggestion has been duly noted, and will be certainly considered later on; but, perhaps, in the mean while I may recommend that gentleman to word his copyright invoices thus:—

"Fee for permission to reproduce copyright photograph of ———— in ————. My name to be printed under each impression. Note.—This fee is for production in the ———— only, and, if another use is desired, a fresh permission and payment is necessary."

If the paper, &c., in spite of this, lends or sells the block, the next step will be to register the photograph, and "go" for full fees. Should, however, the photograph have been registered, damages could be obtained, as mentioned in Mr. Elliott's pamphlet on *Photographic Copyright*.—I am, yours, &c., Charles Marsh.

"THE NEW ENGLISH."

To the Editor.

Sir,—We are gradually becoming familiar with, and reconciled to, the fact that most of the articles in daily use in this country are "made in Germany." There are, of course, a few exceptions to this general rule, but they are gradually growing fewer and fewer.

One of the very oldest and finest of all our manufactures now appears about to transplant its works across the Atlantic. Need I say, sir, that I refer to the English language. It appears that this article, like so many other of our staple products, is not quite abreast of modern requirements. It is too old-fashioned, ambiguous, anomalous and inconsistent. The atmosphere generated by our effete and antiquated civilisation is utterly antagonistic to its proper growth and development, and the consequence is that from henceforward all our best and cheapest language will be manufactured for us on the other side of the herring pond.

Here have we, in our crass and insular ignorance, been using (among many others), words like autograph, lithograph, palæograph, micrograph, stenograph, stereograph, monograph, epigraph, and photograph, as though they were nouns, while all the time, as every one *now* knows, they ought really to be verbs.

For, look you, to telegraph = to write at a distance, and a telegram = the writing made at a distance, and to photograph = to write by light (at least, so we are told); therefore, the writing made by light must be a *photogram*, and nothing else.

Could anything be simpler or more conclusive? and is it not *quite* evident that we must henceforth and for ever write autogram, lithogram, paragram, photogram, etc., if we wish to rescue the English language from its present deplorably anomalous and inconsistent condition?

Well, no, I think not quite! Is there not a possibility that, while telegram is derived from two Greek words *téle* = far, *gramma* = a letter, photograph (the noun) may be derived from *phōs* (*phōtos*) = light, and *graphē* = a picture. If Daguerre had lived in the time of Pericles, his productions would have been described by the words *photographē* or *photographēma, not* by the word *photogramma*, and, if we go to the Greeks for the names of our modern inventions, we must observe the rules of the game.

May I add, for the benefit of all concerned, that those persons who describe themselves as "photographers" are guilty of a vulgar, though widespread, error. If they wish to be correct, they should call themselves either "photographists," or, better still, "photograph."* This latter designation would afford those who insist on the adoption of the word "photogram" a good opportunity of supplying an old and trusted *employé* with a new berth.

The word "photographer" is not to be found in the last edition of *Webster's Dictionary of the English Language*, London, 1889, a quarto volume of 1920 closely printed pages.—I am, yours, &c.,

Leonard Crossle.

54 *Loftus-road, W., January* 22, 1894.

THE ACTION OF METOL ON THE SKIN.

To the Editor.

Sir,—The attack which has been made in your valuable Journal against metol is such that it would be necessary to warn everybody against the use of this developer, if it was to be taken *au sérieux*, or if the symptoms described were suffered by all, or even a majority of those who use metol.

Fortunately, however, this is not the case, and we must again confirm our previous statements that, in spite of the very extensive use that is now being made of metol, only a few isolated cases have been brought forward, and some of the parties who have thus suffered we have consulted, and they tell us that their doctors are of opinion that the symptoms are not due to the metol, but to a predisposition to gout, eczema, &c., in the hands (probably aggravated by the use of caustic alkalies).

It will not be denied that all organic developers, especially pyro, will attack the hands, and mostly in such cases where strong caustic accelerators are used. We do not condemn pyro, but we think that the warning against metol is, to say the least, exaggerated, for the reasons given.

It is our opinion that the attacks, on very sensitive skin even, may be prevented entirely if, instead of the caustic alkalies—like ammonia and carbonate of potash—the operator will use carbonate of soda, as this has a weak caustic effect. In the instructions issued with metol, formulæ for carbonate of soda will be found.

We hope you will find space for this letter, and we must thank you, also, for having, through the aid of your valuable Journal, assisted to clear up the rumours of which we have complained, and we feel sure that the views we have expressed on the subject are already recognised as correct by 99 per cent. of the users of metol.—We are, yours, &c.,

17, *Philpot-lane, London, E.C.*, Fuerst Brothers.

January 22, 1894.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

Photographs Registered:

Walter George Lewis, Bath.—*Portrait of Anthony Hammond.*

George Higginson, Bowdon, Cheshire.—*Two portraits of Edward Leader Williams.*

Abraham Flatters, Openshaw, Manchester.—*Nine photographs of cotton fibre (entire).*

John Wallace Bennetto, Newquay, Cornwall.—*Instantaneous photograph of wave washing over the North Pier, Newquay.*

H.—No such book by Captain Abney as that mentioned has been issued.

J. A. C.—The Bausch and Lomb shutter is much used in America, and enjoys a high reputation.

Claims.—This correspondent sends neither name nor address, hence his query remains unanswered.

G. B. (Glasgow).—Send us particulars of your method of working, and we may be able to assist you.

Selecta.—Any of the lenses mentioned will answer your purpose nearly equally well; but, if price be no object, we would advise No. 4 on your list.

* Cf. French, *photographe*; German, *photograph;* Spanish and Italian, *fotografo*; Dutch, *fotograaf*, etc.

RUBY.—From personal experience of both systems of charging, we are enabled to say that both are reliable and excellent. We cannot recommend one in preference to the other.

BROMIDE.—Wrong exposure, notwithstanding that you say you have given the right, seems to be the source of the difficulty. No doubt the enlargements have been considerably over-exposed.

E. NORTON.—We do not know of any "good house" where lessons in portrait photography could be obtained. Possibly the classes at the Polytechnic, Regent-street, would suit your purpose.

JOHN PORTEOUS.—Such volumes, if bound, are usually procurable at second-hand book-shops at about half-a-crown each, but double this amount might be paid by those specially wanting them.

T. IVENS.—If you have no copyright in the picture, you can take no proceedings against the proprietors of the paper. They will not pay for what is not your property and what, possibly, belongs to some one else.

H. HILL.—If you prefer to colour the walls of the studio "flat black" we see no objection. Most people, however, prefer a less sepulchral and more cheerful colour, as having a more enlivening effect upon the sitter.

T. C. W.—In selling a second-hand lens with no name upon it, which you know was made abroad, you incur no risk. The case would be different if you put your own name upon it, or any one else's, as being the maker.

A. MCCALE.—If the cylinder has been charged several times during the last two or three months with twenty feet of gas, we should say it would be perfectly safe to contine using it when only charged with twelve or fifteen feet.

HEATON.—Interpose between your ten-inch lens and the light two other lenses, that nearest the line being a meniscus, or plano-convex, of not less than five inches diameter, and the other about eight inches. But you will act more wisely to purchase a properly mounted condenser.

F. L. C.—We have delayed replying to your queries until we learnt something concerning the special kind of lens yours is likely to be, and conclude that it was not made by the optician whose name it bears, but that probably the original lenses have been supplanted by others. We would know better if we saw it.

R. ROBINS.—Boiling water, at sea level, in an open vessel, has only one temperature, although it may be quoted at different figures. According to the Fahrenheit scale, it is 212°. According to the Centigrade scale it is 100°, and the Reaumur 80°. Of course, the temperature is the same whatever scale may be adopted.

A. B. C.—As the equivalent focus of the lens is not stated, it is impossible to say the distance required for the enlargement. On page 970 of the ALMANAC is a table that gives the distance required for lenses of all foci. A condenser of five and a half inches' diameter will suffice for enlarging from a quarter-plate negative to ten by eight or any other size.

WELLER.—If the "scum-like markings" can be seen on the plates before they are exposed, it is needless to say that they cannot be avoided by any modification in the development. Perfect plates are not always obtained at the first essay at making them. However, do not be disheartened at a few failures. Remember, "Rome was not built in a day."

T. BENN.—If the film floats off the plate directly it is put into the silver bath, it is pretty certain that the collodion is not of the right kind. From the tone of your letter we suspect that you have been adding the iodide to "enamelling" collodion. If that is so, no wonder at the trouble. Better purchase some negative collodion for the first attempts.

J. WETHERALL.—Unless a binocular camera is used for taking interiors stereoscopically, it is almost impossible to get both negatives identical in exposure and density. The stereoscopic effect will be quite as good with a single lens as with a pair. It is simply a question of uniformity in the two halves of the negative, and that is difficult to obtain with a prolonged exposure in a varying light.

W. GIRLING.—If the lens be one of the so-called "rapid" class, and it be desired to use the back combination only, the stop should be inserted about as much farther from the lens as the position occupied by the front combination, or possibly a little nearer the centre than that position. No rule for this can be given. This also applies, although conversely, when employing the front lens alone.

ALPHA.—You will have to take a negative of the candle flame by a camera in the usual way and have it printed on ready-sensitised paper. The image of the candle flame cannot be taken on paper direct unless you have had some previous acquaintance with photographic manipulation; but, if you have such knowledge, then can it be taken on bromised sensitive paper. A common cheap quarter-plate French lens will answer the purpose.

M. R. A. writes: "I am going *viâ* Paris and Switzerland to Venice, Florence, and Rome. Will you kindly say if there is any difficulty on the frontier in taking a camera (whole-plate) into Italy, and whether any permission is necessary for taking photographs in those cities?"—There will be no difficulty about taking the apparatus into Italy. Perhaps some reader who has travelled in that country will say what photographic restrictions there are, if any at all.

J. E.—1. So far as we are aware, no experiments on the relative strengths of metol, eikonogen, and quinol as reducing agents have been published. Our experience in practice is that they rank in the order named, taking under-timed exposures as the guide. 2. The caustic alkalies are more powerful than the carbonates. 3. The proportions given seem about right, but we should dilute the developer to half the strength you mention, making the water two ounces.

W. B.—If you will refer to pp. 954-5 of the ALMANAC for 1894, you will find tables for the simplification of emulsion calculations which will possibly give you the information you require—that is, how much silver nitrate is required to convert a mixture of chloride and bromide. We imagine that the combination does not take place to the exclusion of one of the haloids. The composition of the silver haloid is not altered by the presence of a slight excess of soluble haloid.

T. B. HEATH.—A camera specially made for the purpose is required for producing such micro-photographs as you describe. They are reduced from a large negative (usually quarter-plate size). The lens is a microscopic one of a little over half an inch in focus. This, at any rate, is the focus of ours. The process is the wet-collodion one; none other will serve the purpose. If you can procure the required kind of camera, and succeed in making the minute pictures, write again, and we will tell you how to mount them on the end of the lens to which they are ultimately attached.

MASE writes as follows: "I am in possession of a negative—one that I got when buying the business, six years ago—of Dr. ——, who wants to publish his photograph in all his work. They are published by ——. He sent another photographer down to see if he could get two mounted prints, as he wished to copy them. I refused. Dr. —— has himself written to me since I have offered it—the negative—for 10s. He refuses to give it. What am I to do in the matter?"—It seems to us that, as the negative is our correspondent's property, he can dispose of it on what terms he chooses to make. If the portrait was taken in the ordinary course of business, there is an implied contract that prints may be had at any time, often mentioned on the mount, and presumably at the current rate. However, the price fixed for the negative is exceedingly moderate, and we are surprised that the firm mentioned should demur.

FRIAR JOHN says: "Will you please reply to the following queries:—1. I wish to develop some carbon prints on Whatman's drawing paper. In what way must the latter be treated in order to make the prints adhere during development? 2. Is it possible to transfer a collodion positive film from its glass support to a metal plate (copper, for example) by detaching it in water and floating on to the copper plate? 3. Can you give a formula for a varnish that would blacken the surface of the metal before applying the film?"—Reply: 1. Make a solution of gelatine in water—say, an ounce of Nelson's No. 1 in a pint of water—and then add about twenty grains of chrome alum in an ounce of water; coat the paper with that. 2. Yes, place the plate in a dish of water to which a few drops of hydrofluoric acid has been added. In a few minutes the film will become detached, and may then be floated on to the copper. 3. Ordinary black varnish thinned with turpentine.

NAIVETE says: "1. I use a half-plate burnisher for finishing, and back in the very cold weather I put the steel bar on top of the stove instead of heating in the usual way with spirit-lamp; leaving it there too long, it became quite blue. Can I remedy this, or is it of no consequence? 2. This little machine is the source of much trouble, in that it draws the photographs through to about the centre, and in many cases there leaves them to be marked with the bar on the front and the roller at the back. 3. As a lubricator I use pure curd soap; can you recommend a better one? 4. My studio is match-boarded outside, the rough sides of which are inside with the rails and uprights. Now, I cannot afford to match-board it inside; therefore, can you recommend a cheaper mode of lining my shell?"—In reply: 1. The colour is of no consequence if it does not injure the working. If it does, repolish the bar on an oil-stone. 2. Probably the spindle of the roller is bent, or the roller is not true. 3. The lubricant is as good as any. 4. Match-boarding, suitable for the purpose, is very cheap. The inside of the building may be canvassed and papered. That would cost less, but it would have the drawback that in damp weather the covering would expand, and then would look very unsightly.

G. H. writes: "Will you oblige me by saying by what method I can with certainty render a grained gelatine plate capable of conducting electricity? I want to take an electrotype. Plumbago is unsatisfactory, in consequence of the difficulty of getting plumbago into the finest lines. With nitrate of silver I have had poor success. After applying a solution of silver nitrate, and then dipping in ferrous-sulphate solution, on drying the film the silver surface cracks. If I do not dry it, a lot of the finest detail is damaged or lost. If I apply silver nitrate, and allow this to dry, some of the silver nitrate crystallises on the surface, and, of course, hydrogen gas will not remove this. I see in the JOURNAL such phrases as, 'Let an electrotype now be taken,' and I should be much obliged if you would tell me what method has been successfully adopted for rendering the film surface conducting."—In reply: If you cannot succeed in making a plate electrically conductive with plumbago, try fine bronze powder. We have not known a case of failure with this. For fine work silver cannot fail if it is properly applied. Make a saturated aqueous solution of the nitrate, and dilute with alcohol, and, having brushed this over the surface, reduce by exposure to phosphoretted hydrogen. Full details of this method have been published in some manuals of electrotyping and plating, to which we refer you.

*** Several articles, answers to correspondents, &c., are unavoidably held over.

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CHROMO-PHOTOGRAPHY AT HOME AND ABROAD.

It is an undoubted fact that photo-mechanical work generally is making rapid strides in this country, though for some years, it must be admitted, it was much behind that of some of our foreign neighbours. It may still be an open question with many as to whether we are even now so far advanced in some branches as desirable, seeing the amount of work that is daily being imported into the United Kingdom. However, there are some processes in which we can hold our own, half-tone typographic blocks, for example. At one time all the best process blocks were obtained from the Continent. Now those of home production are, for the most part, not only as good as the foreign ones, but in many instances superior. With collotype also we are equal to that produced abroad; but with photogravure—reproduction of paintings—it would seem that we are not equal to some countries; that is, if we may judge from the number of foreign productions to be seen in the windows of first-class print-sellers. But there are reasons, no doubt, for this beyond the mere question of actual skill.

In the above remarks we find ourselves digressing from the object we have in view, which is to point out that there is one branch of mechanical printing that seems to be quite neglected commercially in England, though it appears to be a profitable one elsewhere. We allude to photo-mechanical printing in colours. At the present time we do not know of a single house in England that does this kind of work, or at least, turns out reproductions of works of fine art of the same high class as those imported from abroad.

A great deal has appeared in the Journal during the past year or two on the principle of obtaining the colours of nature by the photographic selective character of the negatives, without retouching, in three printings, after the manner suggested by Ducos Du Hauron now nearly twenty years ago, and also more recently by Vogel. We have, it is true, seen results that have been made on this principle in England; but, it must be confessed, they left much to be desired. Theoretically, this system should yield the most truthful representation of colours in a work of fine art, while retaining the original touch of the artist. On the Continent some fairly good work has been done under this system, but up to the present it has not proved a commercial success. Allusion was made just now to the fine reproductions of paintings, which possess the exact colour of the originals, and also possess the actual touch of the painter; but we do not pretend to say these pictures are obtained in three printings, for we know they are not. We do know, however, that they are obtained with very few printings—far less than are necessary in equally high-class chromo-lithography.

It is not our intention here to discuss the legitimacy or otherwise of the means by which these results are obtained, but only to point out that a class of work which is found to be a commercial success abroad up to the present seems to be entirely ignored here. Singularly enough, the same has been the case with nearly every branch of mechanical photography until its value has been thoroughly established abroad. For proof that there is a demand for coloured pictures at the present time, one has only to glance at the windows of the print-sellers, also the railway bookstalls, at the presentation colour prints—reproductions of paintings—given with some of the illustrated journals.

It is a little difficult to see why chromo-photography has received so little attention here, inasmuch as the two processes that are best adapted for the purpose are those which are worked the most successfully by us, namely, collotype and process blocks. The former process is that which will perhaps yield the finest results in this direction, particularly when worked by power presses, as with them accurate registration in the different printings is easily secured. The latter process is also capable of giving excellent results, and necessarily, with larger numbers, at a cheaper rate than collotype. It also has the advantage that the paper is not made damp in printing; therefore the difficulty of its expansion from that cause, interfering with registration, is avoided. We have incidentally alluded to these two methods of chromo-photographic printing; but there are others, for example, intaglio plates. Goupil & Co. for years have produced photogravures in colours at a single printing, the different parts of the plate being inked in with the various colours. Working on this system is somewhat tedious, and also requires considerable skill on the part of the printer to be expended on each individual impression, which, of course, adds much to the cost of production. However, the firm mentioned have produced some of the finest chromo-photographs that have been shown.

It is not the object, as just mentioned, in this article to discuss the various ways that chromo-photography may be practised, but to direct attention to the fact that a process which is likely to prove a very important one in the near future, and is even now being extensively utilised abroad, is being almost, if not entirely, neglected in this country, while at the same time we are complaining so loudly of foreign competition.

THE WET-COLLODION PROCESS.

VIII.—Failures arising from the Bath.

One would imagine that, the composition of the nitrate of silver bath being so simple as we have described it to be, it could not readily get into disorder. Yet, there are few indeed who have not had their run of success abruptly interfered with by a fit of perversity in the bath.

The visible tokens of this displayed in the pictures are fogginess, streaks in the direction of the dip, pinholes, thinness of, and want of contrast in, the negatives, &c. Old-time photographers know all about troubles of this nature, and we may here say that the providing of a remedy for any one or more of these diseases forms an admirable object lesson to the photographer, however much he might dislike to be compelled to adopt remedial measures in the midst of his business. A wise photographer, however, would keep two baths, one of them always in good condition, with which to relieve the other when it was deemed to be necessary to retire temporarily from active service.

It may be taken for granted that a bath, in as neutral a condition as will give clean images, is the most sensitive of all. The most sensitive one of which we have any cognisance was made of fused nitrate of silver (lunar caustic), the fusion of which had been carried to a farther stage than at first intended, by which it was believed that a modicum of silver nitrite had been formed. This permitted of drop-shutter exposures being given on a day that was by no means bright; but, as it had been placed in a new gutta-percha bath-holder, it became contaminated with organic matter from that source. Organic matter in the bath is the source of most of the evils to which it is liable. It is not easy to say with definiteness how it gets there. We have known it to arise from making the bath with distilled water obtained as waste from a steam engine, oil vapours in this case being supposed to have been present; the ether and alcohol from the frequent immersion of a collodionised plate also leave organic matter behind them.

Slight fogginess will often be cured by the addition of tincture of iodine to the collodion, or a small crystal of iodine, which immediately dissolves. The addition of nitric acid to the bath will also, in many cases, cure fog. The way by which it is to be used is to dilute a drachm of the acid with an ounce of distilled water, and of this add not more than two or three drops at a time to the bath, making trials after each addition.

We have already spoken of gutta-percha baths as inducing fogging. This tendency may, in a great measure, be obviated if the vessel be washed well out at first with water acidulated with nitric acid, followed by pure water, and then be given a thick coating of shellac varnish.

A beginner may, after a time, experience streaks on his plates. These occur under various circumstances. If the plate be immersed in the bath before the ether has had time to evaporate, its displacement by the water has a tendency to be accompanied by greasy-like vertical lines. A preventive of this is found in not immersing the plate too soon after coating, and in giving a slight motion sideways to the plate after it is in the bath. It is well also to give an up-and-down motion to the plate, which should never be placed in the dark slide so long as any such streaky markings appear on the surface.

Pinholes ars caused, mechanically, by particles of dirt floating in the silver bath, and, chemically, by super-saturation with nitro-iodide of silver. This latter is the most fertile source of pinholes.

In a former chapter we said that iodide of silver was soluble in nitrate solution, and that it was soluble in proportion to the strength of the latter. All the time the bath was in use it was gradually getting weaker in silver and stronger in iodide. What is now required is to deiodise it to a great extent. This is done by adding a quantity of distilled water, which, by weakening the strength of the solution, causes a precipitation of silver iodide, which must be removed by filtration. Crystals of silver nitrate are then added to bring up the strength of the bath to what it originally was.

A bath that fogs from the presence of organic matter may be cured by rendering it neutral by means of ammonia or sodium carbonate, and exposing it to sunlight for a day. This is most effectively done by pouring it into a flat porcelain dish and setting it out in a place free from dust. Filtration must follow this treatment.

When the bath has become heavily charged with ether and alcohol, which are abstracted from the collodionised plates immersed, these impurities may, in a large measure, be got rid of by pouring the solution in a porcelain or German glass beaker, and applying heat from a carefully regulated Bunsen gas stove. This treatment, coupled with an after-exposure to the sun, will rarely fail in bringing into good working order the most hopelessly bad bath conceivable.

Especially valuable as an agent in curing badly working baths of numerous ailments is the addition of a few drops of a solution of cyanide of potassium. The chemical action of this has never been satisfactorily explained, but the fact is as stated. It has been found that silver baths which had been sunned for many hours, and still refused to be decolourised, succumbed at once upon an addition of a very few drops of cyanide solution, a gratifying fact being that the pictures obtained subsequently were of a much higher class than those originally got by the same bath.

Markings of a shape akin to oyster shells are sometimes met with. They are often so superficial as to be removable by the application of a tuft of cotton-wool or a camel's-hair brush after drying, or by the point of the tongue while the plate is still wet. These are, in the main, produced by the contact of the silver solution with the wood of the dark slide and its back-flow over the surface. Wipe the back of the plate before placing it in the slide, and, if the rebate is not protected at the corners by glass or by silver wires, insert a slip of blotting-paper to cut off direct contact with the wood, and, in all probability, such markings will henceforth be conspicuous by their absence.

The Photographic Convention of the United Kingdom.—It has now been decided that the Convention at Dublin shall take place during the week commencing July 9. The opening *conversazione*, which will take place in the evening of that day, is expected to be unusually brilliant, as several of the nobility, gentry, and people of scientific and social note in Ireland will be present. The Irish people seem determined that this Convention shall be one that will not be forgotten in years to come. Further particulars will be published anon.

Constancy of the Electric Arc Light.—Captain Abney has already pointed out the unvarying nature of the light of the electric arc, and proposed it as a light standard, and recently M. Violle, in the *Journal de Physique*, has shown the same fact. He

considers that his experiments demonstrate that the electric arc is the test of a perfectly definite physical phenomenon, namely, the ebullition of carbon, for the arc is characterised by a constant brightness (*i.e.*, the light given out by a given area of the positive crater is constant), and by the temperature being always the same, as well as by all the circumstances which characterise normal ebullition. All these investigations go to show that in the electric arc we have the nearest, if not an actual, approach to a constant light standard yet proposed.

An Extraordinary Lens.—When a spherical glass lens was found in one of the tombs of the Pharaohs, it was looked upon as, perhaps, the most wonderful lens in existence, though later investigations threw doubt upon the belief that the object had ever been used as a lens for any optical purpose. Be this as it may, we think that the palm will be carried off by Professor Dewar's wonderful lens, exhibited in his lecture on Liquid Atmospheric Air. It was composed of liquid oxygen enclosed in a spherical vacuum vessel. Its temperature was 200° below zero, a point at which, as we have previously shown, all chemical action, except that produced by light upon a photographic plate, ceases. Yet, cold though this lens was, it was able to concentrate the rays from an electric arc, permitting them to pass through easily and ignite a piece of black paper held in their focus.

Insoluble Gelatine.—In describing a method of making microscopic slides of gelatine "colonies," as cultivations of particular microbes are termed, a German experimentalist, as quoted in *Nature*, describes a new method of making gelatine perfectly hard and insoluble, which, as it may have more than a passing interest in photography, we here describe. He simply exposes a thin film of gelatine for some time to the vapour of formaline. A previous investigator had shown that, when gelatine was treated with a solution of this chemical, it would not melt at 37° C.; but, by using the vapour, it becomes absolutely insoluble and hard, so much so, that exposing it to the frame of a Bunsen burner or boiling it in a soda solution failed to liquefy it. If formaline prove to be commercially obtainable, it should offer great possibilities in the way of frill and blister prevention; but at present we can give no information on the subject, as we are unfamiliar with the body—at least, under that name—and, on referring to the last edition of Watts' *Dictionary of Chemistry*, we fail to find it alluded to.

Photo-Telegraphy.—In the *Electrical World of New York* there was recently published an article on this subject, in which it is stated that it does not seem improbable that we shall be, some day, able to produce a device by means of which this much sought-for result (the transmission of images by electricity) may be obtained. Some one has stated, in substance, that the general principles involved will be the conversion of the picture to be transmitted into a series of electrical pulsations, and afterwards causing these pulsations to act upon a receiver at the distant end of the line in such a manner as to reproduce the picture. The writer, Mr. H. C. Johnson, thinks the next point to consider is, whether the transmission of the various points is to be synchronous or quickly successive, to take advantage of the persistence of vision. He expresses a doubt about the practicability of a single-wire system, and leans to a "larger cable, made up of many thousands of small insulated wires." He proceeds to give a sketch of a device he had worked out. It consists, briefly, of a ground glass to receive the picture, produced by a lens, and revolving closely in front of the ground glass in a cylinder so arranged as to receive minute portions only at a time of the image, a selenium cell receiving the light impact, and, by means of the different states of electrical resistance caused in selenium by the action of light, the current passing through the cell is to record, as pulsations, the varying effect of light of the minute portions of the image in the picture as received. Those of our readers who would wish to have more full information as to details, are referred to the original article, or to the *English Mechanic* for January 19, where it is reproduced.

CAMERA CLUB: THE USE OF COLOURED GLASSES IN PHOTOGRAPHY.

On Thursday, January 26, at the Camera Club, and before a very large attendance, Mr. A. Burchett read a paper on "The Use of Coloured Glasses in Combination with the Lens." On the walls of the room are many photographs of paintings and from nature, illustrating the improved effects Mr. Burchett has obtained. The author said he had long endeavoured to obtain the sky in its true relation to the landscape, and had accidentally succeeded by the combination of green and yellow glasses in the lens. He showed, by means of the lantern, reproductions of an imitation spectrum, with yellow and green glasses, alone and combined. That with the green showed a good rendering of the yellow, and a long range in the blue. He employed the green glass behind the front lens, and the yellow in front of the back, and found that no correction of the focus was necessary. With instantaneous isochromatic plates, and *f*-22 on a sunlit landscape, he had found an exposure of one second suffice; and, on a grey day, three seconds. If the exposure were correct, he found that he got the effect of nature at the time. Under-exposure was to be avoided. The effect was a purely mechanical one, and in sunshine or shadow was unmistakable. He developed with a solution of less strength than the normal and less restrained by bromide. He always used isochromatic plates, but thought the same results could be obtained with ordinary plates, and drew attention to the absence of halation in the results shown.

Mr. F. E. Ives said that he had made thousands of coloured screens for photographing the spectrum. It was less difficult than photographing the colours themselves. Ten years ago Captain Abney had pointed out the sensitiveness of a plate to all the colours. By a simple combination of colour screens they could make photographs of any spectrum combination they chose to have—it was really an easy matter. He would not think of making a photograph of an oil painting by any other means. The two glasses Mr. Burchett used gave a better result than the yellow alone, simply because the yellow was not yellow enough.

Mr. T. R. Dallmeyer said that Mr. Burchett's process translated perfectly. He (Mr. Dallmeyer) was considering the possibility of making a lens permanently orthochromatic by coloured balsam between the lenses.

After remarks by Mr. Warnerke, Mr. Lyonel Clark, Mr. Davison, and other gentlemen, Captain Abney (who presided) showed on the screen comparative results, with and without the yellow and green glasses, of Alpine views, the superiority of those taken with the glasses being obvious.

A vote of thanks was passed to Mr. Burchett for his paper.

ON THINGS IN GENERAL.

Soon after welcoming the New Year, photographers had another infant to give greeting to—a right lusty infant it is—the new photographic magazine, *Photogram*. No one can complain that a title should be coined without regard to its being an integral part of our language, for the title of a journal has much to do with, at any rate, its initial success. Many of us are familiar with the outcry that greeted the un-English title of the great illustrated weekly known as *The Graphic*, an adjective used as noun, contrary to all English usage; but educated people will deride the idea of an obscure technical journal attempting to change our language by introducing a word of its own coining to displace one universally accepted and employed by all writers of eminence. I am neither defending nor decrying the etymology of the word, but it is now part of our language—it came many years ago, and came to stay. If analogy to the word telegram has been the leading motive, let me commend to these false-coiners the newspaper war that ensued on the introduction of the word telegram into official use. It was conclusively shown to be a sample of false coinage; but it also came to stay, although "telegrapheme" was held to be the truly correct mode of construction. However, I will dismiss the subject with the utterance of a shrewd suspicion that a 'cute advertising dodge underlies all other motives.

We are threatened with a plethora of treatises on the great gelatino-chloride printing-out paper question, a material of which, also, every one will say it has come to stay. It possesses great advantages, and now that, in addition to the horribly glossy surface that characterised the first makes, we can also have a beautiful matt surface direct, without transference from a plate, we may hope for a great future for photographic prints. I feel entirely in accord with the Editor in his recent suggestion that one cause of the decline in reputation in artistic eyes of photographic prints was the introduction of the highly glossy albumenised paper. As the manufacture progresses, we shall probably have different brands to suit different negatives. At present a strong, very slightly under-exposed negative will not give results in any way equalling an albumenised paper print. On the other hand, faint and feeble negatives will give, on the new paper, splendid results in comparison with those on albumenised paper. At this stage I should like to give an earnest word of advice, which, as it is the deep conviction of one who has been photographing almost every day for the last thirty or more years, should deserve some consideration. It is this: On no account whatever consent to use a combined toning and fixing bath alone. The introduction of alkaline gold toning saved the reputation of photographers generally; let us not go back to the old discarded source of uncounted faded pictures. It is quite beyond the mark to point to old photographs, still in existence and unfaded, that were produced by its agency, because, for such unfaded, there were hundreds of thousands utterly fugitive. If we knew the exact conditions that governed the fugacity-producing quality of this bath, my strictures would have less value, but we do not; we may guess, conclude, &c., but we cannot say for certain what states of bath will, or will not, cause fading; nor can we indicate when a bath is in one or the other condition.

Prints faded in the way the old combined bath caused have been said to be injured by "sulphuration" or "sulphur-toning." Well, we do know that sulphur somehow is at the bottom of the matter, but I never yet met any one who could say what he really meant when he used this mystic formula, or could put it in chemical symbols. I suppose it must be considered as an acknowledged photographic "fetish;" but it is very unscientific, nevertheless. I am reminded of this aspect of the subject by reading of the letter from M. E. Audra at the French Photographic Society, in which he offered a medal for a simple, certain, practical separate bath method for these prints, the combined bath always giving proofs "more or less sulphurated."

I see the "Symmetrical" lens is again matter for discussion as to the relative merits of back and front lens. I think Mr. Sutton was the great exponent of a symmetrical combination, and the well-known Ross rapid symmetrical was originally symmetrically formed; but I believe eventually the makers, in the endeavour to obtain as near perfection as possible, abandoned the truly symmetrical form, and that their lenses, as now made, have the posterior and anterior compounds of different foci.

Under the heading of "A Coming Background Law-suit" we are told of the probability of a contested claim for a continuous background and foreground coming before the Law Courts of the United States. Mr. Entrekin took out a patent in 1891, and Mr. Rockwood states that he had such a background in use before that time. Now, I am under the strong impression that Mr. Edge (now of Llandudno, formerly of that town and of Preston) used such an arrangement about a quarter of a century ago. Should he happen to see this remark, he will perhaps correct me, if I am wrong.

Has any one tried the method described by Mr. Matthew Wilson on pages 23 and 24 of this JOURNAL for using a preliminary bath of chlorine water for nullifying the effect of over-exposure in bromide plates? The idea seems good, the results almost too good to be true. It will be one of the most important improvements introduced of recent years should it prove a really practical one, for, after all, the cleverest of us do sometimes over-expose.

I was very pleased to see an article on our old friend carbon printing over the signature of George Bankart, for, once the slight initial difficulties overcome, it is a very beautiful and an undoubtedly permanent process.

As to matt printing, perhaps the first ever produced were autotype matt prints, and they possess a delicate beauty all their own, and unsurpassable. It would be a gain to photography were a few professionals to take up this side of the process, and make its beauties better known.

FREE LANCE.

GLASS POSITIVES ON ORDINARY GELATINE PLATES.

A WEEK or two back I noticed an inquiry on the last page of the JOURNAL as to the manipulation of gelatine plates for the production of glass positives, and as during the early summer of last year I described a method of working I had witnessed in use, and have since made a number of experiments in the same direction, I shall be glad to give a few hints on the subject.

Many attempts have been made to put on the market dry-plate films which will take the place of the ferrotype, but for some reason or other none of them appear to have "taken." This can certainly not be on account of any inherent difficulty in the matter, for with very little modification of the usual course of procedure, and with ordinary negative plates, it is very easy to secure results that will compare most favourably with those obtained upon wet-collodion films. The difficulties rest rather, I suspect, with the operators themselves, who either will not, or cannot, so far depart from their usual beaten track to conform to the necessarily altered conditions of working. At any rate, the tin-type man still continues to employ collodion in preference to gelatine.

This class of picture is, of course, essentially a professional product, but there are many opportunities in amateur practice where it may be turned to account, as, for instance, when just a single picture of some person, object, or view, is required. Clearly, if a positive can be obtained with the same, or even less, trouble than a negative, it is waste of time to go the more roundabout way of taking the latter from which to make a print. For professionals, too, doing a miscellaneous trade, the glass positive might be made to fill a place, and to suit a class of customers who cannot, or will not, afford the price of the conventional cartes or cabinet.

But it is more especially in connexion with such functions as bazaars or similar fêtes as alluded to by the correspondent of a fortnight ago, that I have been drawn to the matter. Some of the readers of the JOURNAL will probably remember what "good business" was made some fourteen or fifteen years ago out of portraiture by artificial light at fancy dress balls, as many as 180, or more, negatives having been secured at one such entertainment, and frequently over a hundred. What that means in the way of business requires but simple calculation. Similarly at bazaars or garden fêtes during the season, a quick and ready means of taking single portraits could be made to yield a good return, the pictures being finished and delivered at the time of selling, when the ordinary *carte-de-visite* or cabinet for subsequent delivery would be out of the question.

As I have already said, it is comparatively easy with the ordinary commercial plates to produce positives that will compare very favourably with much of the work of that class that is turned out by some of the travelling professors of the art, though I shall not go so far as to say that gelatine will equal the best collodion work. I say "comparatively" easy because all that is required is to recognise one or two points, in which the treatment differs totally from that necessary in the production of a negative.

In the first place, something depends, no doubt, upon the plate itself. Obviously, we must start with a film that will develop absolutely free from fog; but, after that, a good deal will hinge upon the colour tendency of the image. Some plates exhibit a far stronger tendency than others to the production of a visible positive image—that is, of a pale or creamy colour by reflected light, and I fancy, from observations extending over a number of years, that the best result in that direction is obtained with films containing iodide or chloride of silver. Certain it is that with both bromo-chloride and bromo-iodide films I have often, without attempting it, produced images that were almost as good positives as negatives. Of the commercial plates I have tried for the purpose, the ones that best lend themselves to positive work are the "London Ordinary."

After the plate itself the next important question is the exposure, and here I must differ from some of the opinions expressed on that

point. For instance, in the article by the Earl of Rosse in the volume for 1887, referred to in your "Answers" column a fortnight ago, stress is laid upon the curtailment of the exposure in order to keep the shadows free from veil. In my own experience I have found the reverse course to be necessary, namely, to give *full* exposure in order to avoid any necessity for forcing the development, which inevitably leads to a bad colour. At the same time, although the shadows may remain clear, it will be found that any detail that may be present will be so faint from under-exposure as to have practically no value from either a positive or a negative point of view. The gelatine and the collodion deposits are totally different in this respect, the latter being of such a character that, when scarcely visible by transmitted light, it presents a strong image by reflection, whereas the gelatine film is rather stronger by transmitted than by reflected light.

It is necessary, therefore, to give a full exposure in order to bring out the shadow details strongly. The same exposure, indeed, should be given as for the production of a good negative image on the same plate, but it does not follow that the development should be conducted on the same lines. On the contrary, it must be stopped the instant the shadows show sufficient detail, or the detail has acquired sufficient strength, and while there is still plenty of "clear glass" remaining, or what will be clear glass after fixing. In the first two or three attempts the results will probably be disappointing from the stoppage of development before the details have acquired sufficient strength, the shadows showing after fixing as little better than masses of black. This fault, however, can soon be remedied.

In order to arrest the further action of the developer when the right point is reached, it is not sufficient to merely wash the plate, as the continued action of the developer on the film will in most instances suffice to produce enough veil to rob the image of its brilliancy and destroy the half-tones. As a sudden check upon the development, I am in the habit of using a twenty grain solution of bromide of potassium, rendered slightly acid with citric acid. The quantity of acid should be very small, sufficient only to very little more than neutralise the alkali left in the film, otherwise the film will require very careful washing before fixing, in order to avoid the formation of an opalescence in the shadows. I keep a thirty grain solution of citric acid and add a few drops to the bromide solution as required. The plate, after development, is rinsed, and immersed in this solution, where it may remain for five minutes.

As to the developing solution, no doubt more depends upon this than upon any other condition. The choice rests between pyro, metol, and para-amidophenol; the last-named answers with any plate I have tried, but the best result of all I have got with pyro, using "London Ordinary" plates. Again I cannot agree with the Earl of Rosse in recommending ferrous oxalate, as it seems almost impossible with that to avoid a precipitation of oxalate of lime, in and on the film, which quite destroys its brightness as a positive.

Whatever the agent employed, its strength must be very much below that usually employed for negative purposes, in fact, not more than one-third. If pyro be chosen, one grain to the ounce will be quite strong enough, the alkali—either ammonia or carbonate of potash, but on no account carbonate of soda—remaining at the normal, while the proportion of bromide may be increased almost *ad libitum*, but it should certainly be doubled or trebled as compared with the proportions necessary for the negative on the same kind of plate. What is required is a thin, rather flat image, with perfectly clear glass in the deepest shadows, and this is best arrived at in the manner I have indicated. If too strong a developer be used, the half-tones and high lights will be clogged and rendered heavy, or lose their transparency, before the details are sufficiently strong, but by keeping down the strength the better-lighted portions of the image are incapable of taking on too much density.

After development, the plate is immersed in the check solution for five or ten minutes. It is then washed and transferred to the fixing bath, which may, with great advantage, be of the *acid* class, this helping to preserve or promote the transparency of the shadows.

It only remains to be said that, after drying, the film is rendered more transparent by varnishing with *thin* negative varnish. The image is then backed up with black cloth or paper, not with black varnish, and mounted in any convenient manner. W. B. Bolton.

CARBON PRINTING.

[Photographic Club.]

Had not my name been put into our programme while I was away from England, I should have felt some little diffidence in bringing so simple a subject as carbon printing before the Club, particularly as I fear I can say nothing beyond what most of the members are already quite familiar with. I shall not weary you with the early history of the process, except to briefly point out the various steps which have led up to its present state of perfection. I need scarcely mention that carbon printing is based upon the action of light on bichromated gelatine and analogous substances. If, for example, we take a sheet of gelatine, and treat it with a solution of bichromate of potash, and dry it in the dark, it still retains its original properties of swelling up in cold and dissolving in warm water. But if it be exposed to light, its character becomes changed. It no longer absorbs water and hot water fails to dissolve it.

Early Experiments.

The earliest experimentalists in carbon printing worked by coating paper with gum, dextrine, gelatine, &c., and a pigment, then, after printing, washing away the unaltered portions; and very good prints may be made in this simple way from black and white subjects, provided the exposure is sufficient to render the colloid body insoluble right through, so as to fix it to the paper. But a little consideration will show that, with half-tone negatives, even if the exposures were sufficient to render the colloid body insoluble right through to the paper in the shadows, there would still be a soluble layer of greater or less thickness in the middle tints. Consequently, when the print is treated with water, although the deepest shadows may be fixed to the paper, the other portions of the image will not. They will be floating about as detached portions of film. It was not until Burnett, Blair, and others pointed out that to obtain pictures in half-tone the exposure must be made on one side of the sensitive layer, and the washing away of the unaltered portions conducted from the other, that successful carbon prints in half-tone were a possibility. Thin paper, paper rendered translucent with oil, wax, varnish, &c., and thin glass plates, and also talc, were all used as supports for the pigmented gelatine, the exposure being made through the support. With paper, however prepared, its fibre interfered with fine definition. Glass, by reason of its thickness, destroyed the sharpness of the image. Talc got over the greater part of this difficulty, but then it could only be had in small pieces. By the way, talc, as a support for the pigmented gelatine, has been reinvented during the last couple of years or so, and forms the subject of a patent.

Fargier's and Swan's Methods.

Early in the "sixties" Fargier introduced his method of working. It was this: A plate of glass was coated with sensitive pigmented gelatine, and the exposure made on the *gelatine* side. After exposure the gelatine was coated with thick collodion. The plate was put into warm water and, after soaking a little while, the collodion floated off, carrying the image with it. This, after sufficient development, was carefully caught, gelatine downward, on a sheet of gelatined paper. It was then allowed to dry, and the collodion dissolved off with ether and alcohol. By Fargier's method I have produced very good small pictures, but I need scarcely mention that it was not adapted for large sizes, or for working on a commercial scale. A little latter, Mr. J. W. Swan introduced his method, which was this: A glass plate was coated with plain collodion and allowed to dry. It was then placed on a levelling stand and coated with pigmented gelatine containing a bichromate. When dry it was stripped from the glass and the tissue was ready for use. The exposure was made through the collodion. The film was then cemented to a temporary support for development, and afterwards transferred to a permanent one. In passing, I may mention that this system of making carbon tissue has also been reinvented and patented a year or two ago. These reinventions are my excuse for saying so much of the early working of the carbon process, which would seem to be but little known at the present time.

Swan's Transfer Process.

Between the lodging of the provisional and the filing of the complete specification, Mr. Swan made a great improvement in the working of his process, which is essentially the same, as will be presently demonstrated. Instead of forming the tissue on glass, he spread the coloured gelatine on paper, either with or without the bichromate. The working then was as follows: The face of the tissue after printing was coated with a solution of indiarubber and allowed to dry. It was then laid, face downward, on a sheet of paper, also

coated with rubber, and the two passed through a rolling press which caused them to adhere. After the picture had been developed and dried, the transfer paper was applied and again dried. The back of the rubber paper was next moistened with benzol and stripped off. This method of working is still followed in some large establishments on the Continent, but with this difference, the paper only is coated with the indiarubber, and adhesion is obtained by immersing it and the tissue in water, and then squeegeeing them together in precisely the same way as you will see done with the "Autotype Flexible Support." I have nothing to say against this method of working, as the results it yields are excellent, except the cost and the fact that the user must prepare the paper himself as, by reason of the tacky nature of the rubber, it cannot be transported. At the present price of rubber I estimate that, with it, the cost of carbon printing is double that with the Autotype support.

Temporary Supports.

Johnson found that carbon prints could be developed, without cementing, on almost any material impervious to water and air, if the tissue were simply moistened with water and squeegeed upon it. Also that, if the material were treated with beeswax or similar substance, the picture could afterwards be removed and would retain the same surface as that upon which it was developed. This is the system now followed. If the support be a permanent one, such as the single transfer paper for example, the image will be reversed as regards left and right unless a specially reversed negative be employed. The most generally used temporary supports in this country are the "Autotype Flexible Support," glass, and metal plates. When glass is employed, whether matt or polished, it is usually, after being French-chalked, coated with collodion. Then, when stripped off, the collodion forms part of the picture. These pictures are generally termed "Chromotypes." Glass as a temporary support is, of course, only suitable for small sizes on account of its fragility, and for this reason a flexible support is almost universally employed. The Autotype Company's temporary support consists of a strong, smooth surface paper, coated first with insoluble gelatine and then with an impervious varnish. This is treated with a solution of beeswax and resin to enable the print to be transferred. Beeswax, 7 grammes; resin, 20 grammes; turpentine, half a litre, makes a suitable solution for the purpose. This support can be used over and over again (but will require to be rewaxed each time)—indeed, until actually worn out, it improves by use.

Preparation of the Tissue.

Single transfer paper is simply a fine paper coated with gelatine containing sufficient chrome alum to render it insoluble in tolerably hot water. Double transfer paper is the same as the single, except that there is less chrome alum used, so that the coating becomes soft and adhesive when treated with warm water. Usually the double transfer paper is coated with pigmented gelatine, the pigment being white, or, if required, tinted. Carbon tissue is made at the Autotype Works in this way: Paper, paid out direct from the reel, is caused, by suitable machinery, to pass over and just touch the surface of the pigmented gelatine solution, which is kept fluid, and at the right temperature, in a trough. As the paper travels it licks up an even coating, which may be made thick or thin according to the viscosity of the solution and the speed of the machine. After receiving its coating, the paper travels upward over a drum, then downwards, and afterwards for some distance horizontally. Before it reaches the end of the machine the gelatine becomes set, when the tissue is cut into lengths and hung up to dry. The compound, besides the pigment, consists merely of gelatine and water, with a certain proportion of sugar. The quantity of this depends upon the kind of gelatine employed and the character of tissue required. As regards the pigments, any may be employed, according to taste, provided they will not be affected by the bichromate, and that they themselves are inert on the gelatine. It goes without saying that the colours selected should be of a permanent nature. As I imagine members of the Club are not likely to make their own tissue, I will not occupy more time with this part of the subject.

The Sensitising Solution.

Two kinds of tissue are manufactured commercially, the one sensitive and the other insensitive. The former is made by adding a certain proportion of bichromate of potash to the gelatine mixture. The latter, of course, requires sensitising afterwards, which is simply done by immersing the tissue in a solution of bichromate of potash. By varying the strength of that, we have the means of modifying the character of the prints. A strong solution tends to give soft and delicate prints, and a dilute one prints with greater contrasts. Therefore, when printing from delicate negatives, a weak bath should be used, and from hard ones a strong bath will give the best results. One of the great advantages of the carbon process is that the tissue can be sensitised to suit every class of negative. A further convenience is that different strengths of solution are not necessary to obtain these conditions, as, practically, the same end may be obtained by a shorter or longer immersion in a solution of medium strength. Here is convenient strength for general work:—

Water	3 litres.
Bichromate of potash	90 grammes.
Liquor ammoniæ	5 „

This gives us a three per cent. solution. With a long soaking, a larger proportion of the solution is absorbed than with a shorter immersion. At a temperature of, say, 60° Fahr., an immersion of about three minutes, or until the tissue becomes pliable, if the superfluous solution be afterwards removed by lightly squeegeeing the tissue on to a glass plate, will be found suitable for negatives of medium density. A shorter or longer time may be given to suit other requirements. If the maximum of bichromate be required, five or six minutes' soaking may be given, and the superfluous solution not squeegeed off. The tissue may be sensitised in an ordinary room, as, while wet, it is practically insensitive to light. If suspended in a dry room the tissue will be ready for use in a few hours. As carbon tissue is now supplied ready sensitised in small quantities, this trouble may be saved. That supplied by the Autotype Company is sensitised, I believe, to suit average requirements. We now come to the printing.

Printing—The Safe Edge.

It is scarcely necessary to tell you that the negative must be provided with a safe edge. This is better put on the glass instead of the film side. A brush charged with black varnish, run round the edges, or strips of opaque paper pasted on, will suffice. As no image is visible in printing, some kind of actinometer is required. Here are three different forms—Johnson's, Sawyer's, and Burton's—all of which are excellent. As tissue varies in sensitiveness, I advise the novice to test it before printing. It is a very simple matter, if a small negative be kept specially for the purpose. All that has to be done is to expose a little bit of the tissue behind it, always giving a fixed exposure—say, for example, two tints by the actinometer. From the development of the image the sensitiveness can be correctly estimated, so that there need be no errors in the exposure. Before beginning to print, it is also a good plan to test the solubility of the tissue by putting a small strip in water, say, at 100° Fahr. If the coating dissolve off readily, all is right; but, if it fail to dissolve, it will be a waste of time to attempt to use it. I have known beginners print a lot of tissue and then find that it has become insoluble by long keeping. There is very great latitude in the exposure, as any error, within a wide range, may be remedied in the development.

It will be well to mention here that the character of the print may be materially influenced by the light in which it is printed. The more brilliant the light, all things being equal, the softer will be the print; and the weaker it is, the greater will be the contrasts. Therefore, it follows that hard negatives should be printed in a strong light on highly sensitised tissue, and feeble ones under the reverse conditions. One other fact should also be alluded to here. Bichromated gelatine is proportionately, as compared with silver paper, more sensitive to a strong light than it is to a weak one. Consequently, in a very dull light, a proportionately longer exposure should be given. If the prints are to be developed at once, the printing should be carried to the full depth. If not, it should be stopped short of it, according to the time they have to be kept and the condition of the atmosphere. This brings us to a very interesting and valuable property in connexion with carbon printing, namely, the "continuing action of light."

Continuing Action of Light.

The action of light, once started, progresses even when the tissue is kept in the dark. At one time this progressive action was considered very uncertain. Experiments made by the late Mr. J. R. Sawyer, and detailed in a paper he read before the Photographic Society of Great Britain, proved that, when the partially exposed prints were freely exposed to the air, the darkening was more rapid than when they were kept away from it; also, that the darkening was not regular. Sometimes it went on rapidly, and at others scarcely at all. I had long noticed that the progressive action was greatest in damp and muggy weather, and very little when the air

was dry and frosty. Some years ago I determined to satisfy myself as to the part that moisture played in the matter. The result of some of the experiments then made I shall now lay before you, though not for the first time; indeed, I think most of the members of the Club are tolerably familiar with them already.

Before going further, I will mention that the prints in each set were made on one piece of tissue, sensitised in the making, six reproduced negatives of equal density being used. After exposure, the tissue was cut into six pieces, each being a complete picture. This set received one half the normal exposure, and one print was developed at once. The others were then suspended in a damp atmosphere at a temperature of 85° Fahr. At the end of an hour one of the prints was developed, and, as you will see, it is over-printed. At the end of an hour and a half the third print was developed, and the fourth at the end of two hours. Both, it will be seen, are very much too dark. The other two prints were kept for two and a half hours, but they could not be developed, as the action had gone quite through the tissue in the deepest shadows, so that the paper could not be removed from those portions. In the next series of prints the exposure was reduced to one-fourth the normal. They were treated as the previous ones, and developed at half-hour intervals. That kept for one hour is about right, the others being much too dark. In the next series the exposure was reduced to one-sixth the normal, and you will see that the print which was kept for an hour is too light, while that kept for an hour and a half is about the right depth. Those kept for two hours and longer were hopelessly overdone.

Having satisfied myself of the effect of moisture accelerated by heat, in this continuing action, I next determined to see whether the absence of it would arrest it. Here is the result. In this case one-fourth the normal exposure was given. After one print had been developed, the others were put into a drying closet, and from that transferred to a metal case and sealed up. At the end of fifty days one of these prints was developed, and it will be seen that it gained nothing by the keeping. The others were developed at the end of 100 and 185 days. You will see that the print which was kept for six months is no darker than that which was developed immediately it was taken from the printing frame. These experiments show that with the carbon process we have the means of obtaining several times the number of prints from a given negative in a given time by taking advantage of this peculiar property; also that, under certain conditions, it may be made very energetic or arrested entirely.

I had intended to have said something about the numerous applications of the carbon process, but time will not permit. Some of them will, however, be seen during the demonstration. I will, however, detain you for a moment with a remark on carbon pictures on rough paper. At our last meeting reference was made to the fact that contact silver prints on rough paper were lacking in sharpness, and detail in the shadows. That must always be the case, on account of the inequalities of the paper preventing uniform contact with negative. That does not apply in carbon printing. The tissue being perfectly smooth and even, it secures an image that has all the sharpness and detail there is in the negative. Consequently, carbon pictures on rough paper are necessarily, when finished, finer in detail and more transparent in the shadows than those printed direct on the uneven surface.

Mr. Burton and Mr. Braham, of the Autotype Works, have kindly consented to lend their aid in the demonstration, and have provided all the requisites.

E. W. Foxlee.

[At the conclusion of the paper, a practical demonstration was successfully given by those gentlemen, pictures being produced on opal glass, flexible supports different kinds of rough and tinted crayon paper, and as transparencies.]

THE ELECTRIC LIGHT STUDIO OF TURNER & CO., BARNSBURY.

Situated in Barnsbury Park, and surrounded by residences of well-to-do classes, are the photographic studio and works of Messrs. Turner & Co., Photographers to the Prince and Princess of Wales. They are nearly equidistant from the Caledonian and Liverpool-roads, and a couple of minutes' walk from the Barnsbury Station of the North London Railway.

The display in the reception room, which forms quite a gallery of works of art, shows that the Messrs. Turner have among their *clientèle* many of the "upper" classes, in addition to those of the blood royal. Having a large amount of out-door space behind their house, Messrs. Turner have availed themselves of this unusual London feature to erect *ateliers* and other appointments by which to enable them to take garden parties and groups to any desired extent.

There is a studio expressly for daylight portraiture, and there is one which sets daylight at defiance, being specially adapted for portraiture by electric light; and, as some of the finest portraits we have ever seen have been taken in this latter studio, we know that it will interest many of our readers, more particularly those in the profession, to have a brief account of it.

The electric lighting installation has been very compactly fitted, and everything connected with it arranged so simply that no special attendant is required, although, when the whole of the apparatus is working, something like twenty-five to thirty horse power in the engine is being developed.

The engine is a double-acting gas engine of special make, of the "Griffin" type, with extra sensitive governor, and the driving motion is perfectly regular and steady, so that no accumulators are used for the incandescent lighting, in the galleries, dressing rooms, &c., the pulsation in the lamps, even with sudden and varying loads, being hardly noticeable.

The method of starting the engine is also unique, as it is not necessary to pull round the flywheels by hand, as in most types of gas engines. A small gas cartridge or fuse is inserted at one end of the cylinder and fired by a percussion arrangement; the force thusgenerated moves the piston forward, and, as it takes in gas during its motion in the ordinary way, the impetus first given carries it on to the firing point, when it receives a further impulse, and picks up the charges in regular order, as when started by hand. This speciality has been devised and patented by the engineer who has fitted up the entire plant, and there are several other novel features also introduced to simplify and ensure safe working, &c.

The electricity is generated by a compound dynamo, driven direct by belting from the engine. The dynamo is of the "Taunton" type, and has a capacity of ten kilowatts, at a speed of about 800 revolutions per minute.

There is a switchboard in the engine room, from which the whole of the various branches are controlled, and from this point the electric current can be directed to the various points required, viz., the main studio, enlarging rooms, printing rooms, portrait gallery, outside arc lamp, or incandescent circuits.

The chief feature of special interest is, of course, the studio arc lamp for portraiture, which is of the "Pilsen" type, made by Messrs. Gwynne & Co., Brook-street, Holborn, but fitted in a special way after careful study and experiment. This lamp alone absorbs when working about three kilowatts of energy, and the normal power of light is equal to 10,000 candle power. This powerful light is, however, not used *direct*, but, being diffused in a special radiating hood, provides a light for portraiture equal to best daylight, and entirely without hard shadow, while it is also quite free from noise or uncomfortable glare.

For enlarging and copying a more simple form of arc lamp is used, but fitted in a suitable frame with universal adjustment and other special features suiting it for its purpose.

For printing, also, a powerful arc lamp is sometimes used, which enables prints to be obtained on certain kinds of paper when printing by daylight is inconvenient or urgency requires this process to be carried out at night.

The portrait galleries are lighted by strong incandescent lamps, arranged in silvered glass reflectors, throwing the light on the portraits, &c., without dazzling the eye, and the dressing rooms and entrance are also brilliantly lit with incandescent lamps, whilst, when the outside arc lamp spreads its radiance abroad, the whole neighbourhood is illumined for a considerable distance.

The engineer who has fitted and arranged the whole of the electrical apparatus and machinery (Mr. H. J. Crewe, of 76, Queen Victoria-street, E.C.) informs us that arrangements can be made for supplying plant and apparatus to suit almost any requirements and on very reasonable terms, and photographers who have to keep up their connexion, and are desirous of being in the front rank of their profession and up to date in their arrangements, will certainly have to consider the advisability of adding this "substitute for daylight" to their establishments.

During our visit, which was in the evening, we witnessed the starting of the engine by a blow upon the percussion cap as described, and greatly admired the celerity with which the engine responded to the blow. We had, too, the advantage of sitting for a portrait by the electric lamp. Those capable of judging of the result strongly assert the fidelity of the likeness. What we know is that the light was very pleasant and soft, and that an exposure of four seconds with a stopped-down Voigtlander lens proved amply sufficient.

GAS CYLINDERS.*

Professor Goodman's Experiments on Cylinders.

Owners of these cylinders have said to me, "You make a lot of fuss about one particular make. Have you evidence to prove that the other solid-drawn cylinders are safe?" My answer is, "Plenty." The first requisite of a solid-drawn cylinder, just as much as a lap-welded one, is a ductile metal, and there is an accumulation of evidence to prove that these cylinders fulfil that condition. I hardly like to conjecture on the number which have been filled by the Brin Company, but it is many thousands, and, so far, there has never been an accident with them. Further than this, as I have already stated, we have at intervals destroyed these cylinders, just to test the ductility of the metal, and I have never met with an instance in which the results were unsatisfactory. The figures I have already quoted are based on these tests, and they are, in themselves, evidence of the suitable character of the metal. Perhaps, however, the best evidence of all is the test made by Professor Goodman on one of these cylinders in his recent investigations. The cylinder was one which happened to be at the Yorkshire College at the time, and I will quote from his report:—

"The cylinder when fully charged with oxygen was dropped through a height of twenty-two feet on to a block of cast iron. It alighted on its bottom end, and was *very slightly* indented, so slightly that few were able to detect the dent until it was pointed out. After discharging the oxygen, the cylinder was subjected to an internal hydraulic pressure of two tons per square inch, which was left on for about a quarter of an hour. No bulging or distortion could be detected by careful measurements. The cylinder was then considered safe, and was returned to the Oxygen Company to be refilled. On its return the cylinder was again dropped through a height of twenty-two feet, and another very slight dent produced. The cylinder was then taken to the top of the Engineering Department of the College, and was twice dropped through a height of fifty feet. The first time it alighted on a sharp corner of the cast-iron block, and the second time on the flat surface of the block; the only result of the dropping was to produce two small dents. The cylinder was then laid flat on the table of the testing machine, and a sharp V-block pressed into it with hydraulic pressure in order to find to what depth the cylinder might be dented before giving way. The pressure was gradually increased until the cylinder (four inches diameter) was squeezed almost flat, and the V-block had made a dent two and a quarter inches deep; it then suddenly tore apart along both sides, producing a loud report, but without dislodging a single loose fragment. The cylinder, although torn, is still in one piece. Thus, if such a cylinder had been accidentally burst by a railway collision or otherwise, the probability is that no one would have been hurt. Every precaution was taken to prevent personal injury when the experiment was made by packing it round with bagging and timber. The former caught fire when the rupture took place."

I don't think better evidence than this of the reliability of properly constructed solid-drawn cylinders could be found. Our determination to reanneal them at intervals of three or four years is simply the outcome of the lesson taught by the Bradford accident. It is an additional and inexpensive precaution, and one of which the makers themselves approve.

I will now turn to the methods we employ for ensuring the reliability of cylinders before filling them with gas.

Every cylinder, when it is delivered at the works, is first examined to see if it bears the Company's test marks. If it does not, we know that the cylinder has never previously been filled by us, and it is at once sent into the testing shop. There it is first examined and weighed in order to discover the type and approximate thickness. If these are satisfactory, it is charged with water and tested hydraulically to a pressure of one and a half tons in a special apparatus, by means of which the effect of the hydraulic test is registered. The principal object of the apparatus is to test the elastic limit of the metal of the cylinder. If the hydraulic test strains the metal beyond this limit, it is at once registered on an indicating tube, and the cylinder is condemned. If, however, as in the great majority of cases, where cylinders have passed the weight test, no permanent stretch is registered, the cylinder is considered satisfactory, and it is stamped on the neck and valve with the Company's test mark. Under the test mark on the valve a figure denoting the year of the test is stamped, and finally, if it already bears a number, that number and other particulars, such as exact date of test, owner, and type of cylinder, are registered in a test book; or, if it bears no number, a number is given to it, and similar entries made in the test book. After that the cylinder is sent into the factory and filled, and, as far as the Company is concerned, it is considered safe for any amount of use during a period not exceeding two years, at the end of which time they consider it desirable to retest the cylinder. When it has been retested and proved satisfactory, another figure, denoting year of retest, is entered in the test book, and so on, until, I believe, a very remote period, when the cylinder will ultimately give out under the hydraulic test. It is hardly necessary to add that it is only a small percentage of the cylinders delivered at the works daily that require to be treated in this way. In the majority of cases they already bear the Company's test mark and the figure indicating that they have been tested within two years. In such cases they are sent direct into the factory to be filled.

A great deal has been said since the Bradford accident about the folly of employing very high test pressures in the belief that they ensure further safety. In justice to myself, and to show that this is no new theory, I venture to quote from a chapter in my recent *Handbook on Compressed Oxygen*, which was in print at the time the accident took place.

In describing our method of testing cylinders I write as follows:—

"Every cylinder which enters the Company's Works is subjected, before being filled for the first time with gas, to an hydraulic test pressure of 1½ tons per square inch, which is practically double the pressure to which it is afterwards charged with gas. This pressure causes a tensile strain in the cylinder, which is well within the elastic limit of the metal, so that no possible injury in the form of 'permanent stretch' can be occasioned. This question of elastic limit of metal is one which some dealers are too prone to overlook, they are inclined to think that, the higher the test pressure applied to a cylinder, the more confident they can be of the safety of that cylinder for future use. Such, however, is not the case. It is no more reasonable to overstrain a cylinder by hydraulic testing than it is to overstrain any other structure, and although it is a fact that, in nine cases out of ten, these cylinders would bear a pressure of two tons per square inch without any appreciable 'permanent stretch,' it is none the less a fact that such a test is high for the elastic limit of the metal, and consequently open to objection. It is far better to test to a reasonable standard pressure of 1½ tons per square inch, and to repeat that test at intervals of one, or at most two years, than to go higher, and then rest satisfied as to the soundness of the cylinder."

The recommendation in Professor Goodman's report, "That the high-test pressure now adopted should be reduced," did not apply to *our* test pressure; and I believe 1½ tons per square inch is now adopted as the standard test throughout the trade. I may perhaps add, that should any gentleman present happen to be the owner of a 2-tons tested cylinder, he need have no anxiety about its safety on that account, for, even if it has been at all strained under this needlessly high test, reannealing will get over the difficulty, as it removes the effects of overstrain, or fatigue of metal.

I have already referred to reannealing as an additional precaution which the Company has recently adopted. We have erected a special furnace for doing the work, and are making it a rule to reanneal all cylinders at intervals of about four years. All cylinders now in use will be gradually treated in this way subject to the owner's consent, and as far as possible at his convenience, and, once the system is properly established, cylinders can be reannealed before every alternate hydraulic test, so that no additional inconvenience will be caused by the regulation.

It is, perhaps, desirable that I should refer more fully to the weight test, which is one which the Company has recently adopted. Its primary object, as I have already mentioned, is to detect, approximately, the thickness of cylinders sent in by private owners to be filled. We have fixed on certain *minimum* weights for the different types and sizes of cylinders, which just allow of the thicknesses I have already mentioned, *if the metal is uniform throughout*. Where this is the case, cylinders of the proper material and ductility will pass our hydraulic test. If, however, they pass the weight test, and the metal is unequal or defective, then the hydraulic test will reveal it, and the cylinder will be condemned. The object of the test is, therefore, twofold.

(1) It is a rough means of preventing light cylinders of hard unsuitable metal passing into use, and

(2) It prevents cylinders being destroyed under the hydraulic test, when their only fault is, that they are too thin for the particular pressure we employ.

Such cylinders, as these latter, of the lap-welded type, were in use just before the Brin Company started business, and for some time afterwards, and it may be asked, why such cylinders are not filled by us to a lower pressure. There are two reasons for this. The first is that there are now very few of them remaining, and it would create great confusion in our business to adopt even *two* different filling pressures; and the second (which is the important

* Concluded from page 55.

reason) is, that in order to satisfy the railway companies as to the safety during transit of all the cylinders bearing our test mark, they have requested us to submit to them a specification, giving not only our condition of testing, but also the thickness and quality of the material employed. We are, therefore, compelled to employ more stringent regulations with a view to establishing absolute uniformity in accordance with the specification which we are now waiting to submit to the railway companies when called upon to do so. I may add that, through the intervention of the Board of Trade, it is probable that the railway companies will shortly revert to the carriage of cylinders by passenger trains, subject to all such cylinders being in suitable coverings or packing-cases. The Board of Trade has informed us that they have advised this course, and we are told that the question will be settled this month. I see no reason why cylinder-users should not be satisfied with this concession on the part of the railway companies. It may strike some of us as an unnecessary precaution with cylinders, such as I have described to-night, and, if they were to ask us to do the same with regard to goods traffic, we might reasonably complain, but this is not likely; in fact, I think it much more likely that, when they are thoroughly reassured as to the safety of the trade, the railway companies will revert to the old arrangement all round.*

Lasting Qualities and Working Stress.

There is one other point with regard to the safety of cylinders on which I wish to touch, and that is their lasting qualities. It has been suggested that oxidation of the metal inside an oxygen cylinder must be very great. As a matter of fact, it is exceptionally slight. It is, I believe, a well-known chemical fact that carbonic acid must be present in the gas before any such action can take place. There is none in oxygen made by the Brin process, and this is probably the explanation of the fact that little or no oxidation takes place inside oxygen cylinders, certainly not nearly so much as would have occurred in the same time under the varying conditions of the ordinary atmosphere.

Another more technical point in this connexion which has recently been raised is, that the working stress in the metal of solid-drawn cylinders of the sections I have mentioned is high and variable, and consequently liable in time to fatigue the metal. As some weight is lent to this by one of the recommendations (the only one with which I should be inclined to disagree) of Professor Goodman's recent report, we have taken the opinion of Professor Unwin—probably the highest authority in the kingdom—on the subject. He considers a maximum working stress of ten tons per square inch on the thinnest section of the metal of a weldless cylinder as safe, so long as a suitable quality of steel is used. He recommends periodical annealing as a means for removing the effects of over-strain or fatigue, and he adds that he would prefer a reasonably high working limit of stress and adequate precautions to obtain suitable and ductile steel, rather than a lower working pressure with less stringent precautions. I may say that the stress on our cylinders comes within the limit mentioned by Professor Unwin, and I leave it to you, gentlemen, to judge for yourselves whether or not stringent precautions are taken.

The compressed-gas trade is a comparatively young one, and there is much to watch in its development. The Bradford accident is, as far as I know, the first, and, with the present knowledge of the two recent accidents in America in my mind, I am strongly inclined to add, the only fatal accident which has yet occurred through a defective cylinder. It has taught us useful lessons, and called forth a great variety of opinion and suggestion.

It has been suggested, amongst other things, that the filling pressure of cylinders should be reduced, and I may say it is a matter which has had our serious consideration. I have quoted to-night an opinion of far greater weight than my own, which, I believe, vindicates the filling pressure we employ, and justifies our action in this whole question. At the same time, if any authoritative or technical opinion were expressed as to the desirability of reducing the pressure in order to give a still higher factor of safety, we would not ignore such a recommendation. No such opinion has yet, to my knowledge, been expressed, and I cannot help thinking that an unreasonable scare, rather than a technical knowledge of the question, has inspired most of the correspondence which has recently appeared on the subject.

Government Supervision.

The question of Government supervision has also again been raised, and the Board of Trade has been approached on the subject. There is very little likelihood, however, of the matter being taken up by them; and, if they did, I fail to see where the public would benefit. It is just a case of shifting responsibility from one lot of shoulders to another, and, to my mind, it is far better to leave the responsibility in the hands of those to whom the safety of the trade is of the first importance. I have tried to show you to-night the precautions we employ to secure safety, and it must not be forgotten that we have the strongest of all incentives to adhere rigidly to these precautions in the fact that, if there be an element of danger in the business, it is in the compressing factories that far the greatest risk is run. We have a right to ask for co-operation on the part of cylinder-users, and if they, on their part, when purchasing cylinders, will insist on the sections I have mentioned as the minimum, also a reasonable test pressure of one and a half tons at the hands of the makers, and, above all, the requisite quality of steel, they may rest satisfied as to the safety of the business.

Kenneth S. Murray.

* Since the above paper was read, the railway companies have decided to revert to the carriage of cylinders by passenger trains, subject to the conditions mentioned above.

THE LATE J. W. RAMSDEN.

It seems so short a time that has elapsed since we had a visit from Mr. Ramsden, then apparently in the full vigour and strength of manhood, that the news of his sudden demise came like a shock. For the following brief summary of Mr. Ramsden's career we are indebted to a sympathetic friend, Mr. Thomas W. Thornton, Reginald-terrace, Leeds. He says:—

John William Ramsden was born July, 1834. He was apprenticed to Mr. Slocum, bookseller, of this city. His earliest aspirations were to be an artist, and his studies were directed to this end; but one day, seeing some Daguerreotypes in an optician's window, he was so entranced by their beauty, and saw such possibilities in the newly discovered art, that he never rested until he became a photographer. In order to prepare himself for this, he took up, with characteristic vigour, the study of chemistry and optics, not discarding his first love—art.

His first camera was a cigar box, and his lens a spectacle glass; his first dark room, underneath his bedstead. Being very little more than a boy, with a boy's limited income, and photographic chemicals expensive, it was most amusing, in later days, to hear him relate, with great gusto, the scheming, and planning, and self-denial he had to exercise in order to pursue his experiments.

His earliest work was in connexion with the wax-paper process, and so successful was he with this that Mr. Sparling, assistant to Mr. Fenton, writing in 1856, says, "Mr. Ramsden's solution has produced the best negatives I have ever seen." Many of these negatives are still in existence and in the writer's possession. The prints from them, produced nearly forty years ago, are to-day as perfect as the day they left Mr. Ramsden's hands.

Mr. Ramsden made a speciality of landscape photography, and his first landscape camera is still in existence. It is far more like a packing-case, bound with bands of iron, than a modern camera. It was carried on a pole slung from the shoulders of two men. Mr. Ramsden had a most ingenious and inventive mind, and it was not long before this camera was discarded for a portable camera, focussing from the front, and with a magazine dark slide holding some twenty or thirty pieces of prepared wax paper. This camera had a *taper* extension of some waterproof material, and was made and sold long before the introduction of the Kinnear form of camera. In later years Mr. Ramsden derived great amusement in reading over the applications for patents as recorded in your Journal, and many times, with a chuckle, would produce from his lumber room some discarded piece of apparatus identical in principle, if not in detail, with the one described.

Two of Mr. Ramsden's most notable commissions as a photographer were one from Her Majesty the Queen for a series of untouched photographs of Woodsley House, the residence of Sir Peter Fairbairn, and one from John Ruskin for a series of views of Bolton Abbey and district.

When collodion was introduced, Mr. Ramsden was one of the earliest to recognise its merits and the new power it gave to the photographer, and he was the first man to manufacture it commercially. His collodion was widely known, and maintained its reputation to the time of the introduction of gelatino-bromide plates.

One of the things in which Mr. Ramsden took most pride was the part he took in reducing the diameter of landscape lenses, and his letters to Goddard on this subject and Goddard's replies are most interesting reading.

Mr. Ramsden often spoke of the time when he exhibited his views with the camera and lens made in accordance with his instructions by Goddard, by whom they were taken to the Photographic Society

of Great Britain, and of the incredulity expressed by the members as to the possibility of such views being made by such means.

Mr. Ramsden was an early convert to the gelatine process; in fact, as appears from a communication to your JOURNAL in 1865, in 1849 or 1850 he had produced pictures with very rapid exposures, using starch and similar substances as the vehicle for the silver salt.

He commenced in 1878 the making of gelatine plates for his own work and the use of his many friends, and to the close of his business career his lantern plates were held in high esteem.

He was one of the founders of the Leeds Photographic Society in 1852, some months before the formation of the Photographic Society of Great Britain, and he continued an active valued member to the day of his death. Although he had for some years retired from business life, his interest in photography was as strong as ever, and it was only requisite to let him know that some new process was to be demonstrated, or some fresh formulæ tried, to bring him down into the city as enthusiastic as ever. The last time he came into the city, only two days before his death, was partly to arrange for the writer and another friend to pay him a visit in order to have a long chat over photographic matters.

Some twelve months ago he had the misfortune to break his ancle, and his inability to continue his pursuits with his wonted activity had a very depressing influence upon him; but his decease was most unexpected; notwithstanding his apparent strength he had always been delicate, but there was nothing to indicate that the end was near; he passed away peacefully in his sleep, with a smile on his face as though grander and more glorious scenes had been revealed to him, than those he had loved so well on earth.

It would not be just to close without some reference to his personal qualities. Although abrupt in manner to strangers, his hatred and contempt for all shams and hypocrisy, his nobility of character, and, above all, his tenderness of heart, made him a man whose friendship was prized by all who had the privilege of coming into close contact with him.

EXHIBITION OF PHOTOGRAPHIC ART ORGANIZED BY THE PHOTOGRAPHIC CLUB OF PARIS.

AN Exhibition of considerable interest, which has been open since the 10th of last month, closed its doors on Tuesday last. A few notes of general information, to be followed in next week's issue by a more detailed examination of the position of Photographic Art on the Continent, may be of value. The handsome catalogue, the cover of which is adorned by a spirited semi-nude figure by Dubufe at once shows that the Exhibition is more cosmopolitan in character than almost any other which has been held up to the present time. France, in the natural order of things heads the list of contributors, but it is closely followed by England, both in the number of exhibitors and of pictures hung. The following list gives the number of exhibitors:—France, 69; England, 31; Austria, 15; Switzerland, 9; America, 9; Belgium, Russia, and Holland, 5 each; Portugal, Italy, and Germany, 2 each. More than three thousand frames were sent in, of which 511 only were accepted, the jury of admission (who, according to the ideas of the French executive, were severe in the extreme) being composed of four painters, one engraver, one sculptor, one art critic, one inspector of Fine Arts, and two members of the French Photographic Society.

The English exhibitors, with the number of works contributed by each, were:—Messrs. Alfieri (4), Anckhorn (4), Bergheim (11), Brown (9), Brownrigg (3), Burchett (3), Calland (3), Cameron (3), Cohen (2), Craig Annan (15), Crooke (5), H. E. Davis (6), Dawes (1), Dresser (7), Greger (10), Griffiths (2), Hollyer (3), Hodgson (3), Horsley Hinton (5), Lintott (1), Maitland (Viscount) 2, Maskell (2), Parkinson (4), H. P. Robinson (2), Ralph Robinson (6), Briant (3), Symons (1), Tagliaferro (1), Warnerke (1), Wellington (2), and Wilkinson (1.) The whole of the accepted exhibits from Vienna in the London Salon were hung at Paris, and those from Belgium were also familiar to me. The galleries selected were those of M. Georges Petit in the Rue de Sèze, the best and most frequented in Paris, but this, unfortunately, is not saying much. Those used by the Photographic Club for the purpose of the Exhibition consisted of a narrow entrance corridor, next a very badly lighted antechamber, and, lastly, another not very large gallery; and it can hardly be gainsaid that, however restricted the Committee of selection may appear to have been, the executive would have done better to have refused at least one-third of those selected for hanging. I shall have occasion to refer again to the method of hanging; at present it is not too much to say that great injustice was done to a large number of exhibits, the contributors of which would, no doubt, have much preferred not to be hung at all rather than under such unfavourable conditions. The Exhibition is considered by its promoters an unqualified success; the entire press spoke of it with enthusiasm and astonishment, often at great length; it was honoured by a visit from the President of the Republic and upwards of four thousand paying visitors passed the doors in little more than three weeks. No medals or awards were offered, but each exhibitor will receive a commemorative bronze plaque of very fine execution which has been struck expressly for the occasion. One thing has been incontestably shown by this Exhibition, and that is, that the appreciation of the press and the public was above all directed to the foreign exhibits, and amongst these the highest place is given without a dissentient voice to our own country

ALFRED MASKELL.

PLATINOTYPE.

[Woodford Photographic Society.]

AN ideal process for printing from our negatives would be one that would give the closest resemblance to a fine engraving, that is, prints in pure black or rich sepia on any plain paper, rough or smooth. It should also be simple and certain in its working and results, and permanent. The nearest approach to this ideal is *Platinotype*. In regard to its beauty, it is only necessary to cite the pictures by leading workers that grace the walls of Exhibitions. In certainty of result, simplicity, and permanency it has no rivals.

This demonstration being intended for those who have had little or no experience in working this process, it will be desirable to give most attention to those points that are the result of experience, and consequently not found in the Platinotype Company's instructions.

There are three kinds of paper issued: hot development and cold development papers for black prints, and hot development only for sepia, all being obtainable with either smooth or slightly rough surface.

I propose to demonstrate the hot-bath process, and this in my hands has given more uniform and better results than the cold. The prints are richer, more vigorous, and better in gradation than those on the cold-bath paper; the latter, however, has better keeping qualities.

Strictly speaking platinotype is not a printing-out process. True, there is an image produced by exposure to light, but not sufficiently strong to enable the printing to be gauged with accuracy, especially as, in most cases, the lightest part of the picture is most important in determining its character and effect. A slight over-printing, just sufficient to slightly tint the higher lights, will considerably lower its tone throughout, and destroy its brilliancy. Judging the depth of a platinotype from its appearance is always a difficult task, as absolutely dry and new paper shows a decidedly stronger image in the frame than that that has been kept for a week or ten days between first opening the tube and using, and in any case the highest parts and clouds, excepting very strongly marked and stormy effects, are quite invisible before development.

Since the ability of printing to exactly the depth required is of the greatest importance, a photometer or actinometer is almost a necessity for securing uniform results. I will pass round one that has been my assistant in platinotype printing for several years, consisting of a number of thicknesses of white tissue paper pasted to a glass and fitted to a small printing frame, arranged in squares, so that each has one thickness more than the preceding, the smallest number being about seven layers; strips of opaque paper separate the different squares and surround them all, so that a piece of ordinary silver paper put out to print, with the frames containing the platinotypes, shows a series of squares of varying depth on a white ground; the number of the last square that shows faintly when a certain negative is printed correctly is the number that should be recorded. Should any part of the negative require shielding or masking before other parts are fully printed, the number for this shielding can be noted, and a refinement of printing secured for even the most difficult negatives that I have never found possible by any other means. In any fair light, from the brightest diffused to moderately dull, its readings are thoroughly reliable; but in very bad or dull weather, or when there is a yellowish haze, it cannot be trusted.

In using silver paper for this photometer, it is absolutely necessary to always use the same brand, and it should be kept carefully either under pressure or in an air-tight tube, and not long enough to show any discolouration, otherwise it will be useless.

A photometer of this type seems to possess decided advantages over one in which a strip of sensitive paper is printed to match a standard-painted tint, and then pulled forward and a second tint printed, and so on, as in this latter case a difference in the colour that the paper may print, owing to its dryness or dampness, or the condition of the atmosphere, may make it very difficult to match the standard tint, and change the paper at the right moment, and an error repeated seven or eight times would entirely destroy the value of the reading. With the form advocated there is always the one printing only to follow, and the time to take any particular frame in can be seen at a glance, and there is also no risk of degrading the purity of the high lights or brilliancy of the picture by having to study the depth of printing in too strong a light,

For printing in clouds with certainty, such an instrument is an absolute necessity.

For printing in clouds, it is a great assistance, in placing the mask, to mark the margin of the print with a soft pencil at the principal points.

As an approximate guide for trial prints, it may be assumed that the paper is from two to two and a half times quicker than ordinary silver paper.

It is of the greatest importance that the paper be kept as dry as possible until development, the effects of damp being that the prints are of an inferior quality, the tone dirty, instead of a silvery grey to pure black, and, if the dampness is sufficient, a slight yellowness of the white. For this reason, before and after printing, it is stored in a tube containing chloride of calcium, an indiarubber band preventing dampness leaking through the opening between the tube and lid, and a pad of indiarubber is placed at the back of the paper to protect during printing. This pad will be found valuable in all printing processes.

Development is effected by floating the exposed print for five or six seconds on a hot solution of neutral potassium oxalate, the strength being four ounces of the salt to thirteen ounces of water. Development is a purely mechanical operation; there is no saving an over-exposed print by shorter development, or an under-exposed by longer. Direct from the developer the prints are placed in an acid bath—water, fifty ounces; hydrochloric acid, one ounce—and after about five minutes transferred to a second of the same strength, thence to a third or even a fourth, remaining in the latter rather longer. Half an hour's washing in several changes of water is ample. The prints are then finished.

The development for sepia paper is the same as that for the black prints, with the addition of one-sixth to one-fourth of its volume of a special solution, sold by the Platinotype Company. After using, the developer should not be thrown away, but kept for future use, and protected against a strong light. The standard temperatures for development, recommended by the Platinotype Company, are 140° for black paper and 150° to 160° for sepia. These may, however, be considerably varied at times with advantage.

Over-printing to the extent of 20% may be compensated for by lowering the temperature about 25°, and 40% over-exposure by reducing it 40° to 50°. Prints so treated are indistinguishable from those correctly printed, excepting that, when developed at a lower temperature than 90°, they sometimes have a tendency to become coarse and granular.

It is necessary to know the extent of any error in printing, in order to be able to take advantage of this method of correcting it, though, as the temperature falls, the time of development increases at 90° to 100°, it may sometimes require twenty-five seconds for the print to attain full vigour. In this case development can be watched and stopped when the desired depth is reached.

A still greater advantage of lowering the temperature of development is the power it gives of counteracting the deterioration of the paper due to slight dampness. It is quite impossible to protect it perfectly against the action of damp air after once opening the tube, however carefully it may be kept; prints taken a few days later show a slight falling off in colour, and after a week or ten days the change is more decided.

My own practice is to develop at 135° to 140° the same day that the tube of paper has been opened; after three days the temperature is reduced to 120° to 125°; in a week it may be still further lowered—say, to 115° or even 110°—and the prints so produced are equal in quality to those on new and perfectly dry paper. These temperatures are given for black paper; for sepia prints they should be 15° to 20° higher.

In working by photometer, no over-printing is necessary with paper that has been kept for developing in the cooler bath.

For platinotype a good, vigorous, and fully exposed negative is essential, in order to obtain a print that shall have its deepest shadows a rich black, its higher lights pure white, and a good range of half-tone. Not one that is abnormally dense, but any negative that will give a good rich print on albumenised paper will equally produce a good platinotype. From such a negative of an artistically treated subject a print may be obtained in platinotype that will rival in beauty and artistic value a fine steel engraving.

HENRY W. BENNETT.

THE PHOTO-AUTOCOPYIST.*

WHEN the surface is inked, the picture is clearly visible, and the operator can see before him the exact depth of print he is about to make. Any ordinary paper can be used for making the print on, but that with a moderately hard surface is most suitable. If a margin is required round the print, a mask can be made of thin oiled paper or tracing paper, cut out to shape and size required, and is placed down on parchment, then the paper to make the print on, and a piece of felt or other padding on top, and the whole placed in press and squeezed, and the first print is made; for further prints it is simply a matter of inking parchment, placing down paper, and squeezing in press. In making prints, the paper, being applied to the parchment, absorbs some of the moisture, and so, occasionally, you require to sponge the surface with water and dry up with cloth.

I will now proceed to give you a little active demonstration, and for the convenience of time I will take up the work at this stage: The parchment sheet has been sensitised, dried in the dark on glass, stripped off, printed under the negative, back exposed to the light to harden it, and bichromate soaked out, and the film now lies before us free of the bichromate. I now take it and stretch it on the frame, dry up the underneath surface, pour moistening solution on top surface, leave it thus for a while, and prepare printing ink. As dark colours show up best, I will make a combined colour of black, blue, and brown, which will give me a warm grey. We now add one third varnish, mix with palette knife, and spread with roller; transfer a portion to the second palette, and take up a portion with the other roller. Returning now to the parchment on frame, we pour back the softening solution, mop up the excess, and take up inking roller and ink up parchment. As I explained, the sheet being moist, the ink only clings to the indented parts, which form the picture. Roll backwards and forwards until the picture shows up clean and clear, the whole of the detail being quite visible. Before making print I will pass the parchment round, so that you will see how the picture now stands. Now, to make print, place down the edging, *i.e.*, the paper to make copy on, the felt padding, and squeeze in press. The first copy is but a proof, and you will notice much improvement in the second and third copies, when the film gets thoroughly inked up. Before passing prints round I will show you a method of burnishing them, which is simply to apply a little French chalk and rub off, giving friction with a soft cloth.

I will now go on making more prints from another film, and pass them round for inspection, and I think, gentlemen, you will agree with me that the reproductions are equal to the best collotype process, and the principal features in connexion with the process are its simplicity, rapidity of reproduction, and permanent prints in any colour executed in printers' lithographic ink.

* Concluded from page 57.

PHOTO-LITHOGRAPHY.

ON the 23rd ult. a lecture and demonstration on *Photo-lithography* was given by Mr. B. Bingley in the large room of the Halifax Camera Club. Mr. Bingley is conversant with almost every phase of photography from the time of the "Daguerreotype" up to the present. This, with his lengthened experience as manager for an important firm of lithographers in the town, rendered him peculiarly fitted to give a lecture of this nature. Anticipating a treat in the shape of information little known outside the profession, the members turned up in good numbers, along with a few strangers. The lecturer said that he should confine his remarks and demonstration to the production of *line* work only. That would embrace drawings in ink, woodcuts, or engravings on white ground. Good black ink is most essential in the original drawing or copy, the lines must show a decided firmness without any blurring. A good method of obtaining a drawing which saved much time and trouble was described. His plan was to go and take a photograph of the object to be reproduced, make a bromide enlargement from the negative, and sketch in the principal lines and details required with ink, then bleach out the photograph. Mr. Bingley showed what appeared to be a neatly executed drawing in ink on ordinary drawing-paper, but, on its being placed in a solution of ammonia, it turned out to be a bromide enlargement, the photograph being fully revived in the solution. The apparatus used for the purpose of copying the drawing to be lithographed was exhibited. It consisted of a long board, on which was mounted a substantially built camera of the box type, this kind being much better for this class of work than the bellows camera. The board was arranged so that the camera would slide along its length. At the end opposite the camera was a detachable blackboard, on which was pinned the drawing to be copied, the board having lines across and from top to bottom to facilitate centering. The best negatives for process work are made by the collodion process, but he had obtained very good results with dry plates. He could recommend Thomas's slow landscape plates, but Mawson & Swan made a splendid plate for process work at a little extra expense. The object was to get a negative sufficiently dense to resist the light in printing, and, at the same time, give absolutely clear lines. He strongly advised backing the plates. The drawing to be copied should be lighted from the north, as this does not show the grain of the paper as much as lighting from other sources. An ideal negative was shown which had been made from one of Thomas's plates, had received about forty seconds' exposure with stop 32, and was developed with the following one-solution developer:—

Hydroquinone	60 grains.
Sodium sulphite	2 ounces.
Potass. carbonate	2 ,,
Sodium carbonate crystals	4 ,,
Potass. bromide	100 grains.
Water	20 ounces.

The excess of bromide prevents clogging and permits the use of the

solutions above freezing point. At this time of the year it was advisable to warm the developer slightly; by this means he conld get sufficient density without the trouble of intensifying. When intensification was absolutely necessary—and he only did it when he was compelled—he used bichloride of mercury and common washing soda, the latter did not block up the fine lines as much as ammonia. Stress was laid upon the necessity of thorough washing before putting into the mercury solution, two hours in running water not being too long. Mr. Bingley next described in detail the method of preparing, sensitising, printing, and inking the transfer paper, the various stages in the process being illustrated by experiments. The process, briefly described, is as follows:—

Any good *wove* paper will do; *laid* paper will not do, owing to the ribs in its texture. In practice it is usual to coat a number of sheets with plain gelatine, and sensitise as required; but the lecturer made up the following combined bath:—Three quarters of an ounce of gelatine, cover with water, and allow to soak a few hours; drain off the water, place the gelatine in a pan, add ten ounces of warm water, and warm up until thoroughly dissolved. Now dissolve half an ounce of bichromate of potash in three ounces of hot water; mix this with the gelatine, and strain through fine muslin into a warm dish. The solution should be kept warm during the operation of coating. The paper is floated for about forty seconds on the above bath, and dried in the dark. The paper is stained to a deep yellow by the bichrome. The paper is now cut into suitable sizes and placed under a negative. At this time of the year it takes about an hour to fully print out, but in sunshine about ten minutes. The progress of printing must be examined in the dark room. The fully printed image is rather weak, and of a brown colour on a yeliow ground. The paper is next rubbed all over with transfer ink—if small with a piece of rag, but if large an inking roller would be required. The transfer ink is composed of the following:—

White wax	½ ounce.
Mutton fat	½ ,,
Common pitch	½ ,,
Chalk printing ink	3 ounces.

Melt over a slow fire until the mass is properly amalgamated. For use, reduce to the consistency of thick cream with spirits of turpentine *of a good quality*. When the surface of the print has been covered with the transfer ink, let it stand a few minutes for the turpentine to evaporate; then place in a dish of clean cold water for about half an hour. This causes the gelatine to swell, leaving the lines of the print, which have been rendered insoluble by the action of light, along with their layer of ink, sunk below the surface. The print is now taken out of the water, laid on a slab, and developed by sponging the surface with a circular motion. This removes the superfluous ink, and dissolves out the bichromate unacted upon by light. The specimens handed round at this stage showed the inked lines of the picture to be slightly depressed below the surface. When the whites are clear, the transfer is given a final washing and dried; it is then ready for the lithographer to transfer the picture to his lithographic stone or zinc plate. The lecturer advised the zinc plate on account of its cheapness, and the advantage of being able to have the zinc sent home with the prints. To transfer the picture to the zinc, the face of the transfer is again moistened, and placed face down on the zinc, and squeezed in a press. The paper is then withdrawn, with its gelatine coating, which leaves the ink lines of the picture adhering to the zinc plate. These ink lines represent the "type" from which the prints are taken. In printing, the plate is sponged with water, and an ink roller passed over it, the ink adhering only to the lines of the picture. The sponging and inking is repeated for every print, the lecturer explaining that, if the ink roller were passed over the plate whilst the latter was in a dry state, it would spread the ink all over.

A vote of thanks to the lecturer was proposed by the president, Mr. J. I. Learoyd, and seconded by Mr. E. Booth, and supported by Mr. Thomas Illingworth and Mr. E. Mortimer, the latter remarking that, if this was a sample of the sort of meetings held by the Club, he could not imagine the photographers of the town absenting themselves from them, as they were decidedly educational.

PLATINO-EFFECT BROMIDE PAPER.

We have had submitted to us sample prints on Platino-effect Bromide Paper, a new paper which the Eastman Company are on the point of placing on the market. The paper has a matt surface, and the results are indistinguishable from the finest effects in platinum. The manipulation is precisely the same as with ordinary bromide paper, exposure being made to either artificial or natural light at pleasure. For soft results metol as a developer is recommended. We anticipate having an early opportunity of submitting the paper to trial, but, in the mean while, we congratulate the Company on having introduced a charming new printing surface, and predict for it great popularlty.

News and Notes.

Photographic Club.—February 7, *Intensifying, Reducing, and Fixing.*

West London Photographic Society.—February 6, Technical Social Meeting; Discussion on Exhibition.

Woolwich Photographic Society.—February 8, *The Development of Printing-out Paper*, by Mr. Herbert Fry.

On February 9, at the Central Photographic Club, Coleman's Hotel, Covent Garden, Messrs. Elliott & Son will give a demonstration of the carbon process.

Newcastle-on-Tyne and Northern Counties Photographic Association.—February 13, Monthly Meeting, Lecture and Demonstration, *The Paget Company's* Printing-out Paper, by Mr. S. H. Fry. February 27, Conversational and Lantern Meeting.

The South London Photographic Society have a small display of members work on view at the Central Photographic Club, Maiden-lane, Covent Garden, which is well worth inspsction. It includes some capital examples by Howell, Boxall, Esler, and other noted members.

We are sorry to have to record the sudden death of Mr. W. Paice, M.A., the editor of our contemporary *Light*. On Monday evening last week we conversed with him, then apparently enjoying good health. On Tuesday he was at the printing works of his journal, arranging for its being placed on the press; the day following he suddenly expired.

The Queen's Rooms, Glasgow were *en fête* on the evening of Wednesday, January 24, the occasion being the annual *Conversazione* of the employers and friends of Messrs. George Mason & Co. A most enjoyable and harmonious evening was spent, dancing being kept up with great spirit till well on in the morning. During the evening songs were sung by Mrs. Arthur, Mr. Cox (who were each encored), Mr. Steel, Mr. Gibson; and Mr. Paton gave a recitation.

The Autotype Company have resumed the issue of *Autotype Notes*. "The principal object of the *Notes* will be, as heretofore," says Mr. Bird in an introductory preface, "to popularise and make easy the methods of autotype printing, to give particulars of recent improvements, to furnish explanations of failures and difficulties experienced in practice, and to point out the trade advantages of utilising permanent photography as exemplified in the methods of autotype."

Brixton and Clapham Camera Club.—The Fourth Annual Exhibition will be held at the Clarence Rooms, 376, Coldharbour-lane Brixton, on Tuesday, March 6, 7.30 to 10 p.m.; Wednesday, March 7, 3 to 10 p.m.; Thursday, March 8, 3 to 10 p.m.; Friday, March 9, 3 to 10 p.m.; and Saturday, March 10, 3 to 10 p.m. There will be Lantern Exhibitions and selections of music on each evening at 8.30 p.m. The Hon. Secretary is Mr. B. E. Pinder, 7, McDowall-road, Camberwell.

On Thursday, Friday, and Saturday, 25th, 26th, and 27th ult., there was held at 160 Hope-street, Glasgow, a Photographic Exhibition of a novel kind, which tends to illustrate how the amateur photographer advances both in numbers and importance. The young men in connexion with the office of Messrs. Formans & McCall, engineers, the most of whom seem to be enthusiastic amateurs, held their first annual Exhibition in rooms set apart for the purpose at their offices, where the various classes of work were represented by over 300 pictures, shown by some twenty exhibitors. As can be supposed under existing circumstances, the work was unequal; but, taking it all over, it was a very creditable show for a beginning, and is sure to lead to better things. The firm being the engineers for the West Highland Railway, a greater proportion of the scenes represent the scenery and beauties of the route. The most important exhibit is by J. Bullock, who shows some twenty whole-plate pictures of scenes on the railway route, all of which are carefully finished pictures, produced from negatives which evince artistic selection and experienced manipulation. Thomas H. Wall shows a panorama of Fort Augustus, which is interesting. R. C. Farrell's *Avenue* is the best picture in his set, and A. Blair's *Dunrod Glen* is a pretty bit. The engineering subjects are more interesting for what they represent rather than for any excellence to be found in them from a photographic point of view. With regard to groups and portraits, a considerable advance would need to be made in these two departments to make them of any artistic value; but the general feeling after going over this little show is that, taking it all in all, for a first Exhibition, it is good. But we would advise much more attention being paid to the toning of prints. Even in frames, where a few prints were mounted together, the tones were most unequal, this little defect spoiling the whole set of pictures; also, regarding the mounting and finishing of prints, with a little attention this could be much improved. Printing-out paper, with glossy surfaces, was most favoured. Platinum came next, and there were a few pictures on bromide.

Amateur Photographic Society of Madras Exhibition.—December, 1893.—List of awards, open to general competition: Gold medal (for the best photograph in the Exhibition—figure subject). Nos. 162, C. B. Moore; 326, F. Whaley (highly commended). Gold medal (for the best photograph in the exhibition other than figure subject), Nos. 145, F. Kapp & Co.; 142, F. Kapp & Co. (highly commended). Gold medal (for the best enlargement in the Exhibition), Nos. 194, Nicholas & Co.; 196, ditto (highly commended); 193 (1), ditto (highly commended); 191, ditto (commended). Silver medal (for the best example of photography applied to science), No. 260, C. Michie Smith. Silver medal (for the best landscape photograph), No. 145, F. Kapp & Co. (special certificate, first class). Has been awarded the silver medal, but is debarred from receiving it, having already received a silver medal. 72, J. E. Dumont (siver medal). Silver medal (for the best set of twelve stereoscopic transparencies), No. 342, Surg.-Major J. L. Van Geyzel. Society's Prizes.—Class A, open to the world (silver medal for the best set of four landscapes; bronze medal for second best), Nos. 142, 143, 144, 145, F. Kapp & Co. (silver medal); 294, 296, 297, 299, Surg.-Major J. L. Van Geyzel (bronze

medal). Silver medal for best set of four figure subjects; bronze medal for second best. Nos. 6 (2), 6 (3), 9, 7 (3), Shapoor N. Bhedwar (silver medal); 65, 66, 68, 70, J. E. Dumont (bronze medal). Silver medal for best set of twelve lantern slides; bronze medal for second best, Nos. 331, Robert Frost (silver medal); 328, 329, T. M. Brownrigg (bronze medal). Silver medal for the second best enlargement, Nos. 305, Surg.-Major J. L. Van Geyzel (special certificate first class). Has been awarded the silver medal, but is debarred from receiving it, having already received a silver medal; 285, E. W. Stoney (silver medal). Class B, open to amateurs only (silver medal for the best photograph, any subject; bronze medal for second best), Nos. 162, C. B. Moore (special certificate first class). Has been awarded the silver medal, but is debarred from receiving it, having already received a silver medal. 103, Miss E. J. Farnsworth (silver medal); 76, J. E. Dumont (special certificate second class). Has been awarded the bronze medal, but is debarred from receiving it, having already received a bronze medal, 235, W. B. Post (bronze medal). Silver medal for best set of four figure subjects, Nos. 162, 163, 164, 165, C. B. Moore (silver medal); 73, 74, 75, 76, J. E. Dumont (highly commended); 271, 272, 273, 274, A. Stieglitz (highly commended); 103, 102, 99, 100, Miss E. J. Farnsworth (commended); 221, Pte. D. Pearce (commended). Silver medal for best set of four other than figure subjects, Nos. 294, 296, 297, 299, Surg.-Major J. L. Van Geyzel (special certificate first class). Has been awarded the silver medal, but is debarred from receiving it, having already received a silver medal. 314, 315, 316, 317, Miss M. Watson (silver medal); 238, 239, 240, 241, W. B. Post (commended); 30, 32, 34, 35, T. M. Brownrigg (commended). Bronze medal for best set of six lantern slides, No. 327, A. Brooker. Silver medal for best enlargement, 305, Surg.-Major J. L. Van Geyzel (special certificate first class). Has been awarded the silver medal, but is debarred from receiving it, having already received a silver medal. 218, A. L. H. Palmer (silver medal); 285, E. W. Stoney (highly commended). Silver medal for best set of hand-camera shots, Nos. 270, A. Stieglitz (silver medal); 29, A. Brooker (commended). Class C, to members of the Society only (bronze medal). For the best picture produced by a member who has commenced the practice of photography since January 1, 1893, No. 321, J. L. Walker.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 5	Camera Club	Charing Cross-road, W.C.
,, 5	Peterborough	Bedford Coffee House.
,, 5	Richmond	Greyhound Hotel, Richmond.
,, 5	South London	Hanover Hall, Hanover-park, S.E.
,, 5	Stereoscopic Club	Brooklands Hotel, Brooklands.
,, 6	Birmingham Photo. Society	Club Room, Colonnade Hotel.
,, 6	Bolton Photo. Society	10, Rushton-street, Bolton.
,, 6	Brixton and Clapham	376, Coldharbour-lane, Brixton.
,, 6	Exeter	City Chambers, Gandy-st., Exeter.
,, 6	Hackney	206, Mare-street, Hackney.
,, 6	Herefordshire	Mansion House, Hereford.
,, 6	Keighley and District	Mechanics' Institute, North-street.
,, 6	Lewes	Fitzroy Library, High-st., Lewes.
,, 6	North London	Canonbury Tower, Islington, N.
,, 6	Oxford Photo. Society	Society's Rooms, 136, High-street.
,, 6	Paisley	9, Gauze-street, Paisley.
,, 6	Rotherham	5, Frederick-street, Rotherham.
,, 6	Sheffield Photo. Society	Masonic Hall, Surrey-street.
,, 6	York	Victoria Hall, Goodramgate, York.
,, 7	Edinburgh Photo. Society	38, Castle-street, Edinburgh.
,, 7	Leytonstone	Assembly Rooms, High-road.
,, 7	Photographic Club	Anderton's Hotel, Fleet-street, E.C.
,, 7	Southport	The Studio, 15, Cambridge-arcade.
,, 7	Southsea	3, King's-road, Southsea.
,, 8	Birkenhead Photo. Asso.	Y.M.C.A., Grange-rd., Birkenhead.
,, 8	Camera Club	Charing Cross-road, W.C.
,, 8	Cheltenham	The College Pharmacy, Bath-road.
,, 8	Glossop Dale	Norfolk-square, Glossop.
,, 8	Hull	71, Prospect-street, Hull.
,, 8	Leicester and Leicestershire	Mayor's Parlour, Old Town Hall.
,, 8	London and Provincial	Champion Hotel, 15, Aldersgate-st
,, 8	Manchester Photo. Society	36, George-street, Manchester.
,, 8	Oldham	The Lyceum, Union-street, Oldham.
,, 9	Bristol and West of England	20, Berkeley-square, Bristol.
,, 9	Cardiff	Castle Arcade, Cardiff.
,, 9	Central Photographic Club	Coleman's Hotel, Henrietta-st., W.C
,, 9	Croydon Microscopical	Public Hall, George-street, Croydon.
,, 9	Halifax Camera Club	Club Rooms, 12A, Crossley-street.
,, 9	Holborn	100, High Holborn, London, W.C.
,, 9	Ireland	35, Dawson-street, Dublin.
,, 9	Maidstone	"The Palace," Maidstone.
,, 9	West London	School of Arts and Crafts.
,, 10	Hull	71, Prospect-street, Hull.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 25, Mr. P. Everitt in the chair.

Mr. Hodd showed his hand camera, as promised last week. It was made to his own ideas, to be used either on stand or in the hand. The front extended for copying purposes; the blind shutter was behind the lens, which economised length; the speed of shutter and adjustment of focus were visible from the outside; the ebonite shutters of the dark slide drew right out. It was fitted with swing back and rising front, and weighed, with three slides, four and three-quarter pounds.

Messrs. Schwarz sent sample prints on Dr. Hesekiel's platina-grained printing-out paper.

The CHAIRMAN remarked upon the pleasing brown tones obtained, and the grain of the paper.

Answering a question, Mr. W. E. DEBENHAM said that all the former platinum patents were extinct, except the cold bath process with platinum in the developer.

ORTHOCHROMATIC PHOTOGRAPHY.

The Hon. Secretary showed a print showing the Himalayas, taken from Darjeeling (a distance of sixty miles) with a tele-photo lens on an orthochromatic plate. The lens was stated to give the best results with the first and second stop, and all vibration of the camera must be guarded against. His friend spoke as to the difficulty of keeping all photographic materials, including orthochromatic plates, in the Indian climate.

Mr. DEBENHAM said, where possible it was best to dip plates at home. Referring to an illustration, showing the capabilities of the orthochromtic plate, he said that it was to be regretted that in the explanation there was no mention as to whether a screen had been used or not.

The CHAIRMAN remarked that some coloured inks with the same visual effect had different photographic values, were they specially selected? Mr. Gotz had shown prints from negatives made with and without a coloured screen, there not being much difference, possibly due to this cause.

Mr. J. E. SMITH spoke to the greater sensitiveness of the ordinary plate to magnesium light. Was magnesium more actinic in proportion to its visual effect than daylight?

The meeting considered it was less so.

Mr. HODD asked advice as to purchasing a lens for hand camera which worked at *f*-5·6 in place of an ordinary type rapid rectilinear.

Mr. W. E. DEBENHAM considered that an advantage would accrue from a greater flatness of field when stopped down to the same aperture, say, *f*-8.

A question from the box was read as to the recovery of silver from fixing baths by the insertion of a strip of copper and fusing the precipitate with a flux, a silvery mass (black when broken) was only obtained. Why did the process fail?

Answer: "That the heat used in trying to form the button of metal had not been great enough—the silver had not been melted."

Another question: "(1) Is there any known means by which yellow screens can be made of standard value? (2) Do any firms supply the same? and, if so (3) Are any firms making arrangements to mark plates by their means with the Hurter & Driffield speed numbers as, if possible, it would be a great convenience?"

Mr. DEBENHAM said that a kind of standard screen might be devised, which would cause an exposure to be a certain number of times longer with it on an ordinary plate exposed to daylight than without it on a stated sensitive surface, and respecting this he asked, Was not the Chairman surprised to find that albumenised paper printed fairly quickly under yellow glass?

Mr. CHILD BAYLEY suggested gelatine tinted with picric acid as a standard.

In answer to a question, Mr. DEBENHAM said that his screens were fairly deep, and slowed the exposure about four times.

PHOTOGRAPHIC CLUB.

JANUARY 24,—Mr. Frank Haes in the chair.

Mr. B. J. EDWARDS showed a quarter-plate metal double dark slide for plates or films. The shutters draw right out, and act as recording tablets, being black one side and red the other. After exposure they can be reversed, red side out. The inner case draws completely out, to allow of it being filled with the plates or films.

The CHAIRMAN showed a plate backed with Forester's backing, obtainable at Devonshire Chambers, Bishopsgate-street, the feature of the backing being that it need not be washed off before development.

Mr. J. NESBIT showed a 12×10 enlargement from a quarter-plate negative by Mr. Bridgman, the detail and sharpness being much admired.

CARBON PRINTING.

Mr. E. W. FOXLEE read a paper on this subject [see pages 69–71], in the course of which he showed the various kinds of actinometers, tissues, supports, and examples referred to in the paper.

A practical demonstration of single and double transfer was then given by Messrs. Burton and Braham, with great success and to the evident interest and instruction of a very large meeting of visitors and friends.

In reply to a question from Mr. J. A. Sinclair, Mr. FOXLEE said that the continuating action would not go on when the tissue was squeegeed on to rough paper.

Mr. B. J. EDWARDS complimented Mr. Foxlee and Messrs. Burton and Braham on the able paper and demonstration. He asked the cause of mottled markings occasionally seen in transparency tissue.

Mr. BRAHAM replied that they were supposed to be due to damp, but it was not so. They were caused by pressure, and did not show in printing.

A hearty vote of thanks was passed to Mr. Foxlee, Mr. Burton, and Mr. Braham.

Brixton and Clapham Camera Club.—January 16, Mr. G. P. Wyatt in the chair.—A demonstration was given with the enlarging camera which has been recently acquired by the Club. The Sale and Exchange List, which has been started since the beginning of the year, was passed round for inspection, and several books belonging to the Club's Library were lent out to members. The Exhibition will be held during the week ending March 10 next. Full particulars, tickets, &c., may be obtained from the *Hon. Secretary*, Mr. B. E, PINDER, 7, McDowall-road, Camberwell. Next Meeting, February 6. demonstration by the Photo-autocopyist Company.

Croydon Microscopical and Natural History Club (Photographic Section).—January 26.—Mr. W. D. WELFORD on *Rapid Toning Methods*. In bringing his method of toning before the members, he claimed the following strong features in its favour—features which every one would appreciate when dealing with large batches of prints: Rapidity of action—in from one to two minutes the print was completely toned; uniformity and certainty of tone—fixing did not produce any change; simplicity in making up. There were several forms of the bath, all giving practically the same result, a grey black, as was shown by a series of prints from one negative on several varieties of Ilford and Solio paper, toned in the different baths. The different appearance was caused by the colour of the paper. He still preferred his first love, the "bicarbonate of soda" bath: Chloride of gold, 1 grain; bicarbonate of soda, 25 grains; water, 1½ ounces. To make the other baths, 20 grains acetate of soda, or 25 grains phosphate of soda, or 40 grains borax were substituted. Mr. Welford then toned a number of prints, and fully substantiated the claims made in the course of his remarks. After the prints had been fixed, it was suggested that they should be placed in a reducing solution of ferridcyanide and hypo, along with some toned in a combined bath, in order to see if there was a heavier deposit of gold. The image, however, in each case was completely dissolved away.

Ealing Photographic Society.—January 18, Mr. W. T. White (Vice-President) in the chair.—Mr. F. BYNOE gave a lecture on *The Frena Hand Camera*. The lecture was copiously illustrated with diagrams and views, shown, by means of the optical lantern, by Mr. T. Simpson and Dr. Gibbons. Mr. Bynoe explained that the principal characteristic of the "Frena" was, that it was adapted for the use of cut films without sheaths. The full charge was forty films, though any less number could be inserted. Any individual film could be easily withdrawn after exposure. A second distinctive feature of the "Frena" was, the provision of magnifiers, fitting on to the front of the lens, whereby near objects are brought into focus, the camera working with a fixed focus lens. Specimens of the "Frena" cameras were then handed round for inspection, and a short discussion followed.

Hackney Photographic Society.—January 23, Ladies' Night.—A good gathering of members and friends assembled to witness a lantern entertainment by Mrs. Catherine Weed Ward. A large number of slides were shown on the screen, very varied in subject and most excellent in quality. Mrs. WARD explained that the greater number were from negatives taken during her tour in England in the summer of 1892, while the rest consisted of figure studies and landscapes taken in America. A short description of each subject as it appeared in turn made the exhibition most interesting, and Mrs. Ward was accorded a very hearty vote of thanks on its conclusion. Lantern slides were shown by Messrs. Grant, Carpenter, A. Barker, and Hull, and Messrs. Roberts and Featherstone showed prints on Ilford matt P.O.P. A handy plate-drainer was shown by Mr. Smith, and some of Arundel & Marshall's cheap and useful storage boxes for plates, lantern and micro slides, by the Hon. Secretary.

Richmond Camera Club.—January 22.—Mr. R. L. KIDD gave a paper and demonstration on *Magnesium Light for Portraiture*. He strongly recommended that the powder should be carefully sifted through fine muslin to avoid blocking of the orifice of the lamp, and thus have perfect combustion. To avoid glare in the sitter's eyes, the room should be brilliantly lighted with gas or the oxyhydrogen light. For the shadow side a double lamp should be used, and, to avoid cross lights in the eyes, these lamps should have a screen, made of ground glass or tissue paper. For the light side he used four Optimus lamps, connected together and having a large reflector of block tin mounted on a stand and about eight or nine feet from the ground. The exposure that gave the best result at the demonstration was one of two seconds, with the lens at *f*-8, a fairly rapid plate being used. In filling the above lamps with the powder care should be taken not to fill beyond the vent-hole. The magnesium is blown upwards through a large spirit flame, the combustion being almost, if not quite, perfect, while the amount of smoke produced was much less than with the ordinary run of lamps. Incidentally, Mr. Kidd remarked that on some occasions he had found these lamps very useful for copying oil paintings. Of course, reflections should be avoided, and the light placed at an angle of about 45° from the picture.

West Kent Amateur Photographic Society.—January 22.—Mr. BALDWIN, of the Eastman Company, gave a lecture and demonstration in *Nikko Paper*, illustrated by a number of enlargements and direct prints, matt and glossy surfaces, toned and untoned, the sepia colour obtained by the hypo and alum bath being specially admired. The lecturer, after fully describing, in the most lucid manner, the working of this paper, then developed several pieces, first with metol and then with iron; those developed with metol came up very fast compared with iron developer, members giving preference to the former, being much cleaner in working and result as good.

West London Photographic Society.—January 23, the President (Mr. John A. Hodges) in the chair.—The CHAIRMAN reminded the members that the Annual Exhibition would be held on February 9, and expressed the hope that not only would those present exhibit, but do their best to induce absent members to contribute to the success of the Exhibition by sending pictures. Mr. F. P. CEMBRANO then addressed the meeting upon *Hand Cameras*. He recommended those who could only afford one camera to choose a hand rather than a stand camera. Not only could all work that could be done with a stand camera be done with a hand camera, but, in addition, much that was impracticable with a camera on a stand. A hand camera should be light and portable; sizes larger than quarter-plate became cumbersome. Moreover, enlargements from quarter-plates could, with care, be made equalling, if not excelling, direct prints. The lens should be a *good* rectilinear of five or five and a half inch focus, working at *f*-8, which aperture he found sufficient for ordinary work. Some preferred single lenses on account of brilliancy. That quality, in his opinion, was one that in this class of work should rather be avoided than sought for. A good shutter was essential; his difficulty was to get one to work *slow* enough. Many were far too rapid for general purposes. Many pictures would be saved by working the shutter as slowly as was compatible with holding the camera steady. Another important feature was a *reliable* speed indicator, so as to allow of a particular exposure being repeated. The release should work smoothly, and not require much pressure to liberate it. The manner of holding the camera was a disputed point; some approved one method, some another. A good deal depended upon the position of the release. A finder was essential, and it would be found most convenient to have it in the centre, and not at the side; the advantage of this was demonstrated when taking a view through railings, which often rendered the finder useless. Upon the whole, he preferred the twin-lens camera, because of the difficulty of getting a moving object sharp and in the desired position at the moment of exposure, with ordinary single-lens cameras. That opinion was arrived at after several years' careful consideration. He had found that objects which appeared unimportant on the finder were sufficiently prominent in the developed negative to spoil the picture. Various systems of carrying plates were then discussed; slides were most certain, but the bag changer was trustworthy and convenient. Whether films or plates were to be used would be a matter of taste; films were lighter, but none that the lecturer had tried came up to plates either in quality or rapidity. It might be that the softer surface of the celluloid gave way, and so produced a diminution of rapidity. In regard to the use of a tripod, if he took one he generally found it in the way, rarely having occasion to use it. Mr. LESLIE SELBY thought a hand camera was more useful to a beginner than an ordinary camera, if it was used, when necessary, with a stand; otherwise the stand camera was better. He agreed that quarter-plates were quite large enough; he made 15×12 enlarged negatives from them, and got better results than he could obtain direct. The finder should be at least one-third the size of the quarter-plate, though very few cameras were so fitted, and for architectural work he strongly recommended the adoption of a rising front. Mr. H. SELBY thought makers should pay more attention to the fitting of the finders; in several cases he had found it impossible to get the true amount of image on the glass, it was always necessary to make some allowance. Mr. ADAMS thought the use of hand cameras without focussing adjustments tended to the production of slovenly work, because you could neither subdue nor bring into prominence any particular portion of the subject, and that was one reasoin why it should not be recommended to the beginner. Mr. WINTER sad that practice would overcome the difficulty of getting the object properly on the plate, but no doubt the twin-lens camera was the only one with with which you could see the image up to the actual moment of exposure. He found, however, that it was not difficult to dispense entirely with the use of finders, and, by simply looking along the top of the camera, get the object photographed in the right position on the plate. Further discussion having taken place, the PRESIDENT expressed the opinion that, where only one camera could be purchased, a stand and not a hand camera should be chosen. A hand camera in the hands of a novice tended to the ready production of inferior work, and certainly should not be placed in his hands. Although for lantern work the speaker was in the habit of using a large number of quarter-plates in the course of a year, he preferred to use an ordinary quarter-plate stand camera, on which lenses of varying focal length could be employed. When necessary, it was quite easy to remove the camera from the stand and hold it in the hand like an ordinary hand camera. With regard to the alleged inferiority of rapidity in films, before any definite conclusion could be arrived at, it would be necessary to make the comparison between plates and films coated with the same emulsion, which none of the speakers appeared to have done. His own experience of instantaneous isochromatic plates and films did not lead him to notice any noticeable difference in rapidity.

Woodford Photographic Society.—January 18, the President (Mr. H. Wilmer) in the chair.—The SECRETARY (H. W. Bennett) gave a demonstration of *Platinotype*. He considered that the hot-bath process gave more uniform, richer, and more vigorous prints, and better gradation. He strongly advocated the use of a photometer for gauging the depth of printing, and that, it being impossible to protect the paper perfectly against the effects of dampness after once opening the tube, the consequent deterioration could be counteracted by developing at lower temperatures after keeping the paper. Next meeting, February 1 (informal). Discussion on *Estimating Exposures* to be opened by Mr. E. Marriage. Visitors invited.

Woolwich Photographic Society.—January 25, Colonel C. D. Davies in the chair.—Mr. W. H. Barnes, representing Messrs. B. J. Edwards & Co., showed their new dark slide with film-carriers and adapter. The automatic camera stand, and other specialities of the Thornton-Pickard Co.'s make, were exhibited on their behalf. The cyclist members present seemed very pleased with the dark slide, and also the camera-stand mentioned above. Later in the evening the Chairman introduced Mr. Sandell, who addressed the Society on the subject of *Multiple Films*, followed by a demonstration with samples of the plates purposely over-exposed. Mr. Sandell developed the plates with a very restrained developer, aiming at great density, afterwards reducing by means of ferridcyanide of potass to the required density. During the informal discussion which followed, it was urged that the price of the Sandell plates was a barrier to their popularity—a fact that Mr. Sandell recognised, and promised to give it careful consideration. The usual votes of thanks closed the meeting.

Leeds Photographic Society.—The Annual Lantern-slide Exhibition was held on Thursday, the 18th inst., in the Albert Hall, which was filled by a gathering of some 1200 persons. The President, Mr. J. H. Walker, acted as cicerone, and, before the exhibition of the slides, gave a brief address on the advantages to beginners as well as more advanced workers of membership of a photographic society. He referred to the question of the cost of photography as a hobby, and expressed the opinion that a person who sought and benefited by the instructions and friendly criticism afforded by a society would not find his pastime an expensive one. He greatly deprecated the purchase of beautiful and costly, but often useless, apparatus, and the wholesale spoiling of material, which so often occurred in the case of persons who commenced photography and blundered on in the dark unaided and uninstructed. As an instance of what could be done by an amateur who commenced work under proper supervision, he exhibited four slides of views taken by a new member of the Society on the first and second occasions of his taking his camera out. He also urged

lady amateur photographers to join the Society, and ladies generally to consider the claims of photography when casting about for a hobby. In his opinion the minds and hands of women compared favourably with those of men both in their dexterity of work and in such results of that work as had come under his observation. The exhibition of members' slides was then proceeded with, and some 250 views of every description known to photography were shown on the screen. The landscapes, seascapes, architectural studies, &c., were gathered from Norway, Scotland, all parts of England, and from France and Switzerland, whilst micro-photography, lightning flashes, flowers, and lunar and astronomical pictures were also projected. The slides were contributed by the following members:—The President, Messrs. S. A. Warburton and G. Bingley, Vice-Presidents; Messrs. H. Denison and H. L. P. London, Secretaries; Mr. Washington Teasdale, hon. member, and Messrs. H. P. Atkinson, B. A. Burrell, T. Butterworth, E. H. Jacob, A. W. Atkinson, W. Denham, Rev. W. Kerr-Smith, Messrs. T. Middleton, A. A. Pearson, G. H. Rodwell, J. A. Reffitt, F. Waddington, W. Wright, H. Proctor, A. Kershaw, and J. H. Jackson. The lantern on this occasion was illuminated by the aid of the electric light, a new form of arc lamp, invented by Mr. Bosland, of Leeds, who worked it, being used. This lamp, without any reflector behind it, gave a light superior to any other which the Society had used for this Exhibition in past years. On resuming, after the interval in the proceedings, the President alluded to the loss which the Society and the photographic world generally had sustained the same week by the sudden death of Mr. John William Ramsden, an hon. member of the Society, and one of its founders in the year 1852. He believed Mr. Ramsden was the man who first made collodion an article of commerce, and who invented small lenses, the taper bellows, and other things, and he was also afraid that many secrets connected with photographic work and ideas for new inventions had died with him.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1599.—"Hand or Stand Camera." G. PRICE.—*Dated January*, 1894.

No. 1554.—"Improvements in Photographic Exposing and Developing Apparatus." Communicated by E. Suter. J. R. GOTZ.—*Dated January*, 1894.

No. 1559.—"An Apparatus for Mechanically Determining the Positions of Pairs of Conjugate Foci of Lenses of known Focal Length and for Application to Photographic Cameras or other Apparatus." R. FARMER.—*Dated January*, 1894.

No. 1612.—"Improvements in Photographic Print and Plate Washers.' J. M. TIMMIS and W. H. SMITH.—*Dated January*, 1894.

No. 1675.—"An Improved Apparatus for the Automatic Production of Photographs." Communicated by the Societad Auto-fotografica, Spain. Complete specification. R. HADDAN.—*Dated January*, 1894.

No. 1726.—"Improvements in and relating to Photographic Cameras." Complete specification. J. M. HORSCHEL.—*Dated January*, 1894.

No. 1734.—"Improvements in or connected with Photographic Shutters.' E. SUTER.—*Dated January*, 1894.

No. 1777.—"Imprevements in Photographic Printing Frames." Complete specification. W. BUTCHER, W. F. BUTCHER, and W. J. SPURRIER.—*Dated January*, 1894.

No. 1830.—"Improvements in Stands or Mountings for Photographic Cameras." G. PECK.—*Dated January*, 1894.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"THE NEW ENGLISH."

To the EDITOR.

SIR,—Your correspondent in the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY seems to have fallen into some curious errors.

It is well known how the Greeks distinguished between an active and a completed object, words like "phōtographē" denoting the process at its commencement and in progress, and "phōtogramma" the completion of the operation.

Mr. Crossle says, "If Daguerre had lived in the time of Pericles, his productions would have been described by the words 'phōtographē' or 'phōtographēma.'"

Just so. What inconsistency, then, in our adopting the former, and using "autograph," "lithograph," &c., which *are* substantives? "Autograph" is, to my mind, more euphonious than "autogram," and I see no objection to the term "photographer."

I cannot agree with Mr. Crossle that our language has to be transplanted to another region to improve its character. When we see such innovations as "a works," "a premises," we may well exclaim, "Would that we acted in such matters as do the French, by adopting *one* standard for the proper spelling and compounding of words—the *Dictionnaire de l'Académie!*"—I am, yours, &c.,

PHOTOGRAPHER.

P.O.P. TROUBLES AND AN EMPIRICAL REMEDY.

To the EDITOR.

SIR,—I have been much interested in the correspondence on this subject, as I had not used the new paper long before I discovered that, when stored for some time under certain conditions, it had a tendency to develop big yellow patches when immersed in the ordinary sulphocyanide toning bath.

I was less concerned with the chemical philosophy of this phenomenon than with the shortest way to avoid it. Such a simple remedy as that you propose, viz., a salt bath at the beginning of the process, was just what I needed at the time.

In defect of this, I applied another, which, curiously enough, I have not seen suggested in the course of this correspondence, viz., the substitution for the process recommended by the makers of the Ilford paper of the combined toning and fixing bath (the one containing sulphocyanide), which they specially condemn.

Paper which could never have been used under previous conditions now gave perfectly satisfactory results. I confess to having myself had a prejudice against the combined bath, but I have had no reason to regret the adoption of the formula in question (it is well known to your readers and to the photographic press), which—keeping in view the liability of all the new papers to change—is, I venture to say, an improvement on the similar one recommended by the Eastman Company.

On the score of economy, efficiency, and facility, especially for occasional workers like myself, I have not found any superior.—I am, yours, &c.,

C. C.

Dundee.

PHOTOGRAPHY IN ITALY.

To the EDITOR.

SIR,—If your correspondent "M. R. A." desires to use his camera in Italy, he will have to comply with the provisions of the Royal Decree of August 6, 1893.

This decree, which is causing great dissatisfaction among Italian photographers just now, provides that all persons desiring to photograph "monuments of art" belonging to the State, or objects of artistic, scientific, or literary interest preserved in State institutions, must apply for permission to do so to the authority in whose custody they are, giving his name, the purpose for which he requires the photograph, the process he intends to adopt, and the probable length of his operations, &c.

In return for the permission granted him, the photographer must hand over a duplicate negative, and two, three, or four prints of each object photographed, according to circumstances. In special cases he may be compelled to take, *in addition* to the pictures he requires for his own purposes, a number of others in order to form a complete series.

Photography of objects which are open to the public view is not subject to any restrictions.—I am, yours, &c.,

LEONARD CROSSLE.

54, *Loftus-road, W., January* 29, 1894.

THE SPEED OF PLATES: A CRITICISM AND A REPLY.

To the EDITOR.

SIR,—The art of recrimination is one in which I can pretend to no skill, and therefore with this letter I will close my correspondence with Messrs. Hurter & Driffield through the medium of your pages. I, however, reserve to myself the right to again take up the subject of their papers, and especially to consider certain of them that I have only had an opportunity of seeing within the last week.

The latest letter is of a piece with some other of Messrs. Hurter & Driffield's arguments. In the main, it amounts to this: They impute a statement to me that I did not make, and then proceed to say that this statement is erroneous. Once more I will state that my position is this: I believe, and I consider that I have conclusively shown in my paper, that Messrs. Hurter & Driffield's fundamental assumptions are absolutely wrong. In the case in question, I pointed out that, by a careful interpretation of their criterion for a perfect negative, the words they used were capable of being so construed as to bear a correct meaning. I put this correct meaning into symbols, and showed what the effect of it was.

Messrs. Hurter & Driffield now refuse to accept this correct meaning as that which they meant, and do so with much unnecessary offensiveness. Well, it is no matter! Any one can now see that, interpreted as they desire, their criterion for a perfect negative is pure nonsense. Interpreted in the way that I suggested, it is, as they quote from Captain Abney, "almost self-evident."

The fact is, they are thoroughly muddled between the optical transparency of a negative and its effective photographic transparency, which I have, for convenience' sake, called its "printing value."

With regard to their further reiteration that Captain Abney attempted to prove that a parabola does not differ much from a straight line, as I should always hesitate to accuse any one of wilfully saying that which is untrue, I will simply remark that Messrs. Hurter & Driffield must be

phenomenally and obstinately ignorant. It is not my business to enlighten them. I am only concerned with those who will judge of the arguments on their merits. To them, therefore, I now leave the controversy, in full confidence as to their verdict.—I am, yours, &c.,

Camera Club, January 29. HARRY M. ELDER.

P.S.—Please allow me to correct a printer's error in my last letter. Line 22 from the bottom of page 47, "*entirely*" should obviously be "*inversely.*"

MATT PAPER.

To the EDITOR.

SIR,—Mr. J. R. Gotz suggests that we have claimed too much for the new Ilford Matt Printing-out Paper, and intimates that the Obernetter paper is of a similar character. We have no desire to claim more for our goods than they deserve, and we therefore have pleasure in handing you herewith a sample of our own paper and the Obernetter paper, and we leave you to judge as to whether the claims made on behalf of our paper have been exaggerated or not.—We are, yours, &c.

Ilford, London, E., January 29th, 1894. THE BRITANNIA WORKS CO., LTD.

[The Britannia Works Company's claim to be the first introducers of a perfectly matt emulsion paper seems well founded, as the two samples submitted to us show that the Obernetter paper is not similar in appearance to the Ilford Matt P.O.P. The latter has an absolutely matt surface, while the other has an appreciable gloss.—ED.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

*** Our "Editorial Table," reluctantly crowded out this week, is held over till next.

RECEIVED.—Percy Lund, Arthur Schwarz, Tadrous Hanna, A. Glendinning, Thos. Sharpe, W. Goodwin, and others. In our next.

WILLIAM MARTIN.—Received, thanks.

AUSTRALIA.—Will Mr. E. Purton kindly communicate his address?

HERBERT RUDD.—Possibly the *Paris Photographe* (Nadar, Paris), two francs monthly.

A. F. PENRAVEN (Ipswich Photographic Society).—We shall be pleased to receive the report.

A. J. F. BOND.—Mr. Duran's address is Ravenswood, Trinity-road, Birchfields, Birmingham.

THOS. BLINKHORN.—Brothers' *Manual of Photography* (published by Crosby, Lockwood, & Co.) might suit you.

ENQUIRER (Liverpool).—The patent, if ultimately sustained, will apply to America only. See "Free Lance" in this number.

S.—The sample of pyroxyline sent is not at all suitable for the wet-collodion process. It is evidently intended for collodion for surgical purposes.

P. MCBRIDE.—We do not know if the leading English opticians send out lenses on approval. We rather suspect they do not. Why not write direct and ask them?

A. VANDYKE.—We scarcely understand the kind of picture you refer to. Are they ordinary ceramic photographs, that is, burnt into enamel? If so, they are nothing new in England.

C. R.—All that has been published on enamel photography has appeared in our columns. We are not aware that any in London lay themselves out for this class of work for the trade. There seems to be but little demand for it in this country.

VARNISH.—1. No. 2. As the varnish refuses to clear, it is possible that the spirit is the cause, it not being strong enough. However, some kinds of lac give a deal of trouble in getting the solution clear. Try a fresh sample, and spirit from another source.

CARBO.—Zinc or galvanised iron trays may be used for all purposes in working the carbon process, except for the alum bath, which would act on the zinc. For the alum solution earthenware should be used, or, if working on a large scale, a leaden tray will be best.

L. S. A.—Because the Association have fixed half a guinea as the minimum charge for the use of a copyright picture, it does not prevent you, or any one else, from charging as much more as you like. Every one has the right to make what terms he chooses for the use of his property.

J. A. LOMAX asks: "Could you kindly tell me of any place where I could get stiff brown paper about six or eight feet wide suitable for painting a background?"—Brown paper about six feet wide is supplied at most upholsterers' under the name of "carpet paper." It may possibly be had wider than that, but we do not know where.

PIP writes: "I have a studio fourteen feet wide, with a sixteen-feet skylight, north light. It is a new studio, and gets very heavy shadows. What colour would you advise me to paint the walls?"—A good colour would be a light blue or a French grey. A reflector placed at an angle will soften the shadows to almost any extent. We should not advise the walls being made too light.

T. WILMOTT complains of his albumenised paper prints cracking. He says: "As the prints dry, they curl up very much, and it is in unrolling them that I suspect the damage occurs. Is there any way by which it could be avoided?"—If the prints be allowed to dry between blotting-paper, under slight pressure, they will be kept flat, and the cracking of the albumen will be avoided.

W. A. T.—1. Thin leather, such as may be obtained from the dealers in bookbinders' material. 2. This method is as good as any. 3. To convert Dallmeyer's standard into that of the Photographic Society, multiply the number marked on his stops by ten, and divide by sixteen. The cut is correct. The meaning of the terms *f*-8 and *f*-11 is that the aperture of the stop is one-eighth or one-eleventh of the focal length of the lens.

H. U. N. T. S.—1. If the hypo is damp, and has an unpleasant smell, it should not be used. 2. A slight discolouration of the solution is of no moment. Add more sulphite next time; only half the usual quantity has been used. 3. Both negatives wrongly exposed. The one is about as much under as the other is overdone. If the right exposures were given, according to the instrument, it is evident it is not to be relied upon, unless, indeed, it was misread.

T. W. says: "I recently purchased the stock of a brother amateur, who has given up photography, and amongst the things is a large bottle, labelled, 'silver bath for paper, sixty grains.' It is quite brown. How can I make it fit for use, and know if it is in right order?"—Add a little kaolin to the solution, and shake it up well. Next day filter, and the colour will be gone. To know if the bath is in order, sensitise a sheet of paper, and print it in the ordinary way.

R. R. W.—1. We cannot afford space in this column to give instruction for working different processes; we can only refer you to back volumes. 2. A platinum-toned silver print on salted paper should be fairly permanent if carefully produced, though it will not be so theoretically permanent as a platinotype. 3. A meniscus lens can be made to include an angle of 65°, but it must be worked with a small stop, to cover the edges of the plate well. Such lenses are regular articles of commerce with our leading opticians.

R. E. X. says: "A few months back I bought a lantern, and the object-glass appears to be an ordinary French portrait lens, quarter-plate size, and it gives a very good image on the screen. The other day, wanting to take some small groups of children rapidly, I removed the lens from the lantern, fixed it on a camera, and used it for the purpose. Although the groups were sharply focussed, not one of the negatives was sharp. Can you explain the reason? I may say that at first I was inclined to suspect that the slides of the camera were not in register with the focussing screen, but I find they are."—The reason is that the optical and chemical foci of the lens do not coincide, and that is the case with many lenses of the Petzval form that are specially constructed for lantern purposes.

F. HILL writes: "I have heard and read a good deal from time to time, on the superiority of transparencies by the albumen process over all others. The other day I bought at a pawnbroker's half a dozen stereoscopic slides bearing the name of Ferrier, who, I believe, makes no other kind of slide. I separated the glasses and put the slides in the lantern, and they are not nearly equal to some I have made myself on ——'s lantern plates. Is not this antiquated process being over-lauded?"—The albumen process is a very beautiful one for transparencies, but specially made gelatine plates run it very closely. However, our correspondent's criticism is not a fair one; he has taken slides made for one purpose and used them for another. Those best suited for the stereoscope are not at all good for the lantern, and those best adapted for the lantern do not look well in the stereoscope.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1762. Vol. XLI.—FEBRUARY 9, 1894.

THE INCANDESCENT GAS LIGHT.

There is danger, while the electric light in its many forms is daily gaining ground, that other modes of illumination possessing real photographic value may be neglected, to the detriment of possible progress. For this reason we draw attention to a form of gas burner which has been before the public for some years without making for itself any important position. From our own experience, however, we are able to say that recent improvements in the burner have placed it in a very different and improved aspect. It is not difficult to give a brief description of the means employed to produce a form of light which, if we mistake not, is destined to play an important part in photographic practice. There is, first, a modified Bünsen burner from which the mixed gases escape through four small apertures, a chimney of glass or mica being used to create a draught, after the fashion of an Argand burner. At this stage there is no light. This is obtained by fixing over the flame (in practice this is all fitted and arranged beforehand) a delicate cone-shaped network composed of zirconia or other of the rare earths. The heat from the mixed-air jet raises this to incandescence, the light then produced being far in excess of anything ever produced by the direct combustion of gas in any burner hitherto constructed. Of this we will say more. The cone or "mantle," as the makers term it, has hitherto been the weak point. From one cause or another, it lasted but a short time, and the cost of renewing it made the price almost prohibitive. But now all this is altered, and by reason of a new mode of suspending this mantle its "life" is greatly prolonged. We have had one in daily use since before Christmas last, and it is still apparently as good as when first placed *in situ*.

We have in its use discovered a very important point of practice. It is essential that the gas be not permitted to pass through the burner at too great a rate. When the evening pressure is put on in the place where our burner is used, it is found that it is necessary to turn the tap almost half way "off." If this be not done, there is twice as much gas burnt, and the light does not possess one half its efficiency as at the lower pressure. We lay stress upon this matter, but some who have given the burners a trial have been deceived in this particular manner.

The quality of the light is peculiar, and for domestic purposes, which, however, do not concern us, less pleasant than the usual light we are accustomed to, being of a decidedly greenish cast in comparison. As to its photographic efficiency there is no doubt at all. We are not yet able to give our readers exact data, though we hope to do so at some future time. The following slight experiment will, nevertheless show its indications. We placed two pieces of ordinary albumenised paper at nine inches' distance, one from the incandescent light, and the other from an ordinary No. 6 Bray burner. After the lapse of half an hour the latter was entirely unchanged as far as the eye could judge, while the former had a decided tint.

Two considerations will, naturally, govern any experimenter in deciding upon using the new light or not—the amount of gas consumed and the actual value, relatively, of the illumination. With regard to the former, it may be said that all burner-makers place such an array of figures before the reader of their prospectuses that unless he be familiar with the subject he is apt to become fogged. It can be placed before our readers in an entirely popular manner. Most gas consumers have noticed the figures on the ordinary fishtail or bat's-wing burner to indicate their size—the larger the number the larger the flame, and the greater the amount of gas consumed. A No. 5 or No. 6 is in most common use; a No. 3 gives a flame such as might be used in a small office perhaps. Roughly speaking, these figures represent the number of feet per hour consumed by the burner. Now, let a No. 3 burner be taken, burning, roughly speaking, three feet per hour, obviously no more than a certain amount of gas can come through its orifice, no matter how it is burnt, or what is done with it, after it leaves the burner. Let it be lighted in the ordinary manner, to show that it is in order. Then, turning out the light, let one of the new burners be placed over it, in any temporary fashion, and a light be applied. It will be found that the incandescent burner receives enough of gas to give at its full duty. By this means we can, without any deceptive figures, assure ourselves that the gas consumed, at any rate, does not exceed that required for a very small gas flame of the ordinary pattern.

Next, as to the intensity of the light when obtained. Here, again, a simple method for broadly estimating its visual power is easily carried out. We are not making any but a rough, popular calculation. Taking two lights, one the new burner and one the old, say, even a No. 5, let them illuminate a piece of white cardboard, held flat, in a line between the two. Place a pencil upright upon the cardboard, and note that there will be a cast shadow on each side. Move the card and pencil to and fro between the light till the shadows appear about equal in intensity. In the experiment we made we found, when this equality was arrived at, the incandescent light was five feet distant, and the other burner three feet. Squaring

three, we get nine; squaring five, we get twenty-five. The relative power of the two gases was then as twenty-five to nine, about two and a half to one. Remembering that one was consuming gas at the rate of five feet to the other two, we get twenty-seven to one hundred and twenty-five as the relative efficiency of the two burners for the same consumption of gas; showing, allowing for all possible errors in estimation, that the light given by the new burner is at least four times greater (and, possibly, much more) than with the old. This is a most important point quite apart from its undoubtedly far greater actinic value. But our remarks are already so long that we cannot at this stage make further reference to this aspect of the subject, and we will, therefore, hope to return to it at some future time, content if our readers will examine the new light carefully for themselves.

THE WET-COLLODION PROCESS.

IX.—Collodion Transfers and Photo-crayons.

Any articles on the wet-collodion process would be sadly incomplete were we to omit all reference to collodion transfers and photo-crayons, seeing that by no other means can they be effectively made. While it is quite true that this class of work has, for a few years past, been to a large extent superseded by other means of producing enlargements, we have the best means of knowing that both are still being employed, and are productive of considerable emoluments to those who work them.

In either case, the first requisite is a thin collodion transparency of any desired degree of enlargement. In both, it is necessary that a collodion be used which shall give a film that when dry is quite transparent and free from opalescence, at any rate, from such milkiness or opalescence as resists the clearing influences of a subsequent coating of varnish. It is also necessary that the character of the chemicals employed is such as to give transparence in the shadows. This is easily ascertained by making a transparency, no matter how small, and when dry laying it face down on a white sheet of paper and pressing in contact therewith. If the shadows are too dark and heavy, it indicates that the development has been carried too far, or that the collodion is too rich in the sense of being too heavily iodised.

At this stage of our remarks, which apply to both transfers and photo-crayons, it is better that we now treat them singly.

Soon after the Princess of Wales came to this country Disderi took a negative of this esteemed lady, *cartes* from which soon found their way to the public, and so great was the demand for these that it was impossible to print them by ordinary means in quantities sufficient to keep pace with the requirement. Very soon, however, there was an issue of them of a type differing from the ordinary class of silver prints. They were very delicate, yet vigorous, of an engraving-black tone, and on enamel paper. Responding to an invitation, we visited Disderi's *atelier* at Kensington, and witnessed the production of these and of other members of royal families of Europe, for which he acquired great fame. The were all collodion transfers, and were produced in the following way:—At one end of a copying camera was inserted a negative, at the other end being the dark slide capable of containing a plate of large dimensions, and also capable of being subjected to a series of shifts, both from top to bottom, and from one side to the other. Each shift brought the sensitive plate in front of a square, rather oblong, aperture, in which was focussed the picture be printed. Between the negative and the sensitive plate t lens was inserted. The camera was directed upwards to t sky, and to position No. 1 was given an exposure of, say, fo or five seconds, according to light. Then a shift of the slidi back was made to position No. 2, followed by a similar e posure, and so on until the twelve or twenty-four (as the ca might be) positions were secured.

The images were then developed at one operation by prot sulphate of iron containing a liberal proportion of acetic aci After being fixed, they were toned by means of a wash bichloride of mercury, by which the image was darkened. Th collodion film was then well washed, which, it need scarcely b said, occupies a mere modicum of time compared with tha required for a gelatine film. While still wet, a sheet enamelled paper was laid upon the plate, a squeegee passe over its back to ensure contact, and, without waiting till i became dry, the paper was immediately stripped from the glas plate, carrying with it the one or two dozen pictures thereon.

By means of a punching machine the pictures were cut ou of the sheet and then mounted without other preparation. I this way were printed hundreds of thousands of pictures, singular fact being that, notwithstanding the summary an quick treatment to which they were subjected throughout many of those prints have proved *more permanent* than other printed at the same time on albumenised paper and toned b gold in the most approved method.

Let it be well understood that the mercury treatment mus be carried no farther than the blackening of the silver deposi which formed the image, no after-application of ammonia o other alkali being made.

The method here described, which we have condensed fron notes made on the occasion of the visit referred to, ought t prove of great value to professional photographers, who ar often sadly troubled as to getting orders executed during th prevalence of weather hostile, from its darkness, to printing M. Disderi, at that time the *bon-ton* photographer, not alone o Paris and London, but of Europe, made no difficulty abou permitting his method of printing to be published, and photo graphers at the present day ought not to be too conservative t avail themselves of his methods. The one objection whic might have been urged against these transfers at the time o their introduction, viz., the fear that the British public migh object to tones other than the time-honoured photographi purple, now no longer exists, thanks to the educating in fluences of platina and bromide. On comparing a Disderi prin made in our presence by the method just described with on of the most recently produced platina prints, we find a wondrous degree of similarity in their tone.

If negative collodion is about to be made use of in the pro duction of transfers, it should be of a tough, horny character, and rather thicker than what is required for small negative work. It should also contain a large proportion of bromide, and, as previously stated, it should give a thin and rather feeble image. This it will in all probability do if about one-fourth its bulk of plain uniodised collodion be added to it.

Large transfers, intended to be painted in oil colours, as those so long associated with club work, are made rather differently from the Disderi method described.

These prints are usually enlarged from small negatives, and may be made either by a limelight lantern or by directing the camera to the sky. If brevity of time of exposure is an object,

e development may be done by iron, a strong solution being eferred, but held in check by gelatine and citric acid, this st determining the tone, for without it the print would too grey and feeble by reflected light. But the finest-oking pictures are produced by pyrogallol, the following rmula being one that can be well recommended for the rpose :—

Pyrogallic acid	100 grains.
Citric acid	60 „
Acetic acid	2 ounces.
Water	20 „

The tone given by this is dark yet warm-coloured, and is ch as not to necessitate any after-toning. The finest tones e obtained when this developer is used within a week of its reparation. After fixing, for which hyposulphite of soda ust imperatively be employed, and washing, the picture, is not allowed to dry, but is covered with a sheet of wet ansfer paper, which is squeegeed in contact, and the whole ared up to dry, which it will do in the course of a night. Next orning it is stripped from off the glass plate, and is found ith an extremely glossy surface, favourable for the application oil colours. If it is not to be thus painted, a more matt rface is better, and this is obtained, either by stripping off e paper before it is allowed to dry, or, if dry, by steeping water.

The transfer paper is easily made, and each photographer n prepare it for himself—a large quantity at a time, for it eeps for an indefinite period. Any good paper is ated upon gelatine prepared thus :—Place four ounces of elatine in a quart of water, and allow to soak for half an hour, en warm the vessel by placing it in a second one containing ot water. The gelatine will now become liquefied, when four rains of chrome alum, previously dissolved in hot water, are dded. This is poured into a flat dish, and retained in a fluid ate by the application of gentle heat. The paper is coated y being floated upon this, and a quantity should be done t a time, for the paper will keep, but the gelatine will ot.

When this transfer paper is about to be used, it must be aked in cold water for a few minutes, when the coated rface will have a slimy feeling. It is then laid face down pon the picture as already described.

Concerning photo-crayons little need be said. A thin transarency produced as described is dried upon the glass, and is acked with paper of any desired colour or texture. The pecific name is derived from its productions being vignettes, nd the backing paper having pencil hatching, *à la* crayon, nerging into the photograph.

The Right to One's Face.—When the Monson *versus* ussaud case first came before the public it was surmised by many hat it would assume some importance in connexion with the copyight in one's face, and whether a person could be restrained from xhibiting the portrait of another that had been obtained surreptitiously or without his consent. In the result, an interlocutory njunction was granted, restraining further exhibition. This was ot done on account of the portrait *per se*, but the motive and the urroundings in connexion with which it was shown. The injunction was, however, recalled by the Court of Appeal, not on any point f law, but on an entirely side issue. Therefore the question as to whether the exhibition of a portrait, photographic or otherwise, taken without a person's knowledge—say, with a hand camera, for example —can be restrained or not, remains just as it did before. It will have to be settled some day; of that there is little doubt.

Photographic Evidence.—Those who read the proceedings in the Law Courts, as reported in the daily press, and know what photography is capable of accomplishing, no doubt noted a case in which photography should, one would have thought, have appeared as an important witness. The question turned upon the legibility or otherwise of a number of words which had been pasted over with paper. Probate, it seems, was granted of a will twenty years ago, at which time it was said the words were illegible, but which are now alleged to be legible when examined in a strong light, differently applied. A number of experts, including officials of the British Museum, experts in paper-making, &c., gave their opinions, and, in the end, it was arranged that an independent person, to be appointed by the Judge, should report his opinion, after an examination of the documents. One would have thought that photography in such matters could have supplied evidence that would have been quite as conclusive as, and on the whole much more so than, any that could be obtained from "experts."

Finders.—An important feature in connexion with hand cameras, and one seldom referred to, received some attention during a discussion on this form of apparatus at a late meeting of the West London Photographic Society. It was that makers should give more attention than they do to the adjustment of finders, as it was often found that it was impossible to get the true amount of image on the glass, and it was therefore necessary to make some allowance. This complaint is by no means ill founded. We have frequently seen cameras—particularly the cheaper forms, also more costly ones —in which the finders were so carelessly fixed that, if they had been used as they were, they would have p roved misleading rather than otherwise. If one examines a number of hand cameras, it is seldom found that the angle of view seen in the finders, although they may be accurately fitted, coincides with that included by the lens with which the negative is taken, or that there is any indication on the instrument as to what actual amount of subject will, or will not, be embraced. It is for this reason that many have discarded finders of the small type, and, indeed, finders altogether.

The Poisons Act Again.—As will be seen from a report printed elsewhere, the Pharmaceutical Society last week brought an action, in the Liverpool County Court, against a dealer in photographic material for offending against the Pharmacy Act—he being an unregistered person—by selling two ounces of cyanide of potassium to one of his customers. In the result the dealer was mulcted in a penalty of five pounds and costs. The barrister who appeared for the Society said that "five grains of the poison was a fatal dose, and in the two ounces sold there was poison enough to kill 192 people." It is a pity that those who instructed or "coached" the learned gentleman did not know more about the subject—and arithmetic. Pure cyanide of potassium, of which five grains may be a fatal dose, is a very different thing from the article supplied, commercially, to such as photographers, electroplaters, and gilders. Even suppose that five grains of that were a fatal dose, how would a couple of ounces suffice to kill 192 persons? Photographic material dealers, like pharmaceutical chemists, sell their wares by avoirdupois weight, the ounce being 437½ grains, and one of 480, as in the obsolete apothecaries' weight, would be necessary to make the learned counsel's figures correct. During the hearing of the case it was stated, though denied, that "the course adopted by the Society was to find out individual offenders, and then to demand the penalty of 5*l.* under the Act, which was generally paid, and hence the Society made 'a good thing of it.'" It would be interesting to know if there is any ground for the statement. Anyway, as we have cautioned dealers before, it is illegal for them to sell cyanide of potassium, and some other photographic chemicals that are scheduled in the Pharmacy Act, unless they are registered according to the Act, except in wholesale quantities.

GLASS POSITIVES ON ORDINARY GELATINE PLATES.

In reading over my article on this subject in last week's issue, I find that I have omitted to mention one very important point in the finishing of the positive image. Even under the most favourable circumstances of character of plate, exposure, and development, it seems impossible on gelatine to attain to the same quality of image as with collodion, the colour and brilliancy being invariably somewhat inferior.

Under the circumstances, it is useful to be able to tone or bleach the picture, for which purpose a variety of agents may be used. The first to suggest itself is, of course, bichloride of mercnry, as used in he production of the old "alabastrine" pictures; but, unfortunately, with gelatine films such an amount of washing is required, both before and after the use of the mercury, that the process becomes an uncomfortably lengthy one. It may be remarked, too, that the colour produced by mercury upon gelatine films is far inferior to collodion; but whether that is due to any inherent difference in the composition of the image, or merely to the greater difficulty of thoroughly washing the gelatine film, I am unable to say. The colour is always more or less of a yellowish tinge, quite unlike the pearly whiteness of the alabastrine photograph.

Another and similar application consists of cupric chloride, the colour of the image in this case being pink, and by no means unpleasing. The film requires far less washing, both after fixing and after bleaching, than when mercury is used, and the general quality of result is better. A fifteen or twenty grain to the ounce solution of chloride of copper may be used, but the strength of the solution is not very material; or, if there be any difficulty in obtaining the chloride of copper, an equally good result will be arrived at with a mixture of sulphate of copper and ordinary salt, which forms the chloride by double decomposition.

The best coloured image I have succeeded in getting with gelatine plates, and the nearest approach to the "alabastrine" pictures in appearance, is with bichromate of potash and hydrochloric acid as the bleaching solution. This gives a pure and pearly-white image, and requires but a moderate amount of washing either before or after its application. In the Earl of Rosse's method of working, he recommends a solution of iodine in iodide of potassium, which gives a delicate, though rather peculiar, tinge to the picture, which may be imitated by the addition of a soluble iodide to the bichromate solution. But the pure white produced by hydrochloric acid seems to me preferable.

W. B. Bolton.

GELATINO-CHLORIDE PAPER AND THE ALUM BATH.

Except in rare cases, the necessity for the use of the alum bath in conjunction with gelatine plates has practically disappeared, for the almost general use of hard gelatine has entirely removed the old tendency to frilling and slipping of the film, and the use of sulphite of soda and of the newer developers has rendered stains and discolouration almost unknown.

With the printing-out papers, however, the matter is quite different, for, although, the risk of development stains is altogether absent, yet, for some reason, probably connected with the toning properties of the paper, the emulsions seem all to be made from soft gelatine, and no alum is apparently used in their preparation. The consequence is that, not only is the picture surface extremely tender during the processes of toning, fixing, and washing, but it possesses a disagreeably sticky character until dry. Unlike similar emulsions when spread upon glass, there appears to be no tendency to the fault known as frilling, on account of the better hold the paper presents to the gelatine, and, so far as I remember, I have never met with a case of blistering, though I have seen that defect mentioned.

But the tenderness and adhesiveness of the film during the period between printing and mounting is an ever-present trouble unless careful provision be made against it, and here I think a word of warning may be given to those who, accustomed to dry-plate films and in order to save trouble as they suppose, dispense with the employment of alum because they consider it unnecessary.

I can speak feelingly on the subject, having just spoilt a batch of prints that I was obliged to finish off at once, when I found I was out of alum, and consequently, from "Hobson's choice," I was compelled to dispense with it. I do not employ the alum bath previous to toning and fixing, trusting more to care in handling the prints than to the hardening action of the alum for the preservation of their surfaces; but I may point out a rather important precaution that should be taken, namely, to filter or strain all the water employed through fine muslin or linen in order to remove all particles of grit that may come from the pipes. This, I am convinced, is one of the chief causes of damaged films, for, as the prints rub together, especially in turning them over in the toning bath, it is inevitable that the extremely tender gelatine surface must be scratched and abraded, and when this once starts the print is ruined.

If this care be taken, I think the use of alum may be advantageously deferred until just before drying the prints, since its earlier application, whether before toning or after, only necessitates a much more careful and prolonged washing. I know some of the makers recommend "aluming" before toning, but I do not follow implicitly quite all they direct. I have obtained far better and more even tones since deferring the application of the alum.

But that it should be used as a final wash is, I think, imperative, as it not only removes the unpleasant stickiness, but it is, I think, absolutely essential to the after-safety of the print. It is not difficult to imagine how liable to injury, from the slightest damp, a soluble gelatine print must be, and that is practically the condition of an unalumed print; whereas, after the use of the hardening bath and drying, it may be considered as safe as any other; besides which, it loses, as I have said, its stickiness, and may be mounted as easily as an albumen print, without adhering to the paper it is rubbed down with instead of the mount, as it usually does, and without "taking off" any printing matter it may come in contact with.

I always prefer, when possible, to allow the prints to dry, and to rewet before mounting, as this makes the process still easier, and saves time rather than otherwise by completely hardening the gelatine. After once drying, the print may be treated in every way precisely in the same manner as one on albumen.

I do not for one moment deny that gelatine prints may, with care, be mounted without the use of alum, but I do maintain that they will in *all* cases be better and more easily done after its employment.

W. Lindsay.

ROUGH PAPERS.

[London and Provincial Photographic Association.]

In advocating the use of rough-surfaced papers I am, I believe, fighting a battle against a good deal of opposition; but I hope, before long, to convert some of the opposing forces to my side. Very likely many of you have never seen a print on a rough-surfaced paper, or, if you have seen one, you have admired the result without noticing the means used to obtain it. There are a few men who have had the courage, in spite of adverse opinion, to strike out from the ruck of photographers in an endeavour to produce prints which have some pretensions to artistic qualities. Different methods were used to obtain these results, but mainly they were obtained by taking the negative slightly out of focus, sometimes with much after-work in retouching and painting out. These gentlemen have earned for themselves the unenviable appellation of "fuzzytypists," and, without doubt, the out-of-focus method has been, in some cases, exaggerated, and the apostles of the system, being men of repute in the photographic world, have compelled the attention of others who held opposite views, and the photographic press has been flooded with letters and articles in which the opposing sides expressed themselves with an amount of bitterness that it was difficult for a mere onlooker to understand.

A Plea for "Artistic" Effects.

It is an old saw that "the prophet is not honoured in his own country," and in the same way any man who departs from orthodox beliefs, and publicly expresses his sentiments, is pounced upon by minor bodies anxious for fame, and is mauled and worried until, in bitterness of heart, he retires from the contest disabled, but not beaten, and shuts himself up in solitary enjoyment of his idea. This is the beginning; but the seed has been sown, and the minor lights here and there will, "just for the fun of it, you know," try the thing which has been advocated, only to show you how ridiculous it is. And, behold! when they have tried it, they find that there may be something in it, after all. The practical working of the theory seems distinctly better than the theory itself, and they try again, and compare notes one with the other, and agree that there is decidedly something in it, and by degrees, half ashamed of their conversion, they form into a little society—which, mayhap, degenerates into a mutual admiration society—and then, at last they are so satisfied with themselves that they make their opinions public, upholding the heretical theory of their crushed master, and fighting with accen-

tuated vigour the avalanche of opposition which is again called forth from the other side.

But it is the old fable of the bundle of sticks again (I mean nothing personal by this comparison)—the single stick can be broken, but the bundle is strong in its union. The little society holds together, disseminating its opinions right and left, for there are none so fanatical as converts, and it grows and grows until it becomes a power in the land.

A society for promoting artistic photography has grown among us, and throughout the land men are rapidly becoming converts to the views of its members. There are artists who, using photography as a means of recording their art, seek to hide the vulgar mechanical means employed, who want the softness of outline and delicacy of nature without resorting to the trick of making the negatives out of focus; for this, though being a move in the direction of truth, is not truth itself. We are told that photography cannot lie. There are men who will state that the lens reproduces what is seen by the eye, and cannot be improved upon by human power, and who will yet unblushingly paint out the untruthful reproductions of colour in the negative of a human face. This is a matter on which there is a great difference of opinion, and we can never hope to come to an agreement on the point.

My own belief is that the lens does not reproduce a landscape view as the human eye sees it. Dr. Richard Ball, lecturing not long ago before a photographic society on "Invisible Stars," said that the human eye, though a beautiful structure, was in many respects imperfect; that the photographic lens could see and fix on the sensitive plate hundreds of millions of stars which were quite invisible to the human eye. Yes, and it will reproduce hundreds of millions of details in a landscape that are invisible to the human eye. Perhaps nature is at fault, and our eyes are not as they ought to be. I am content with my own powers of vision, and, when I look at a landscape, generally I see only masses of form, of light, and shade, and colour. If I select a portion of the landscape, and look directly at it, I see much detail (my sight being good), but all the rest of the view is blurred. This must be the same with all people, I suppose. If you have any doubt about it, put up some pieces of printed matter at different distances from the eye, and try to read them all at once. You cannot do it, and yet you can read them all separately. Now, if these different pieces of printed matter are photographed, the whole of them will be readable on the print from the negative.

Blurred Negatives not necessary.

The blurred effect obtained by taking everything out of focus is not a truthful effect, any more than the accurate rendering of microscopical detail; but by the use of a rough paper, so prepared that the image is partially sunk in its surface, you get, in my opinion, the very nearest approach to truth that is possible up to the present. Such a paper has a matt surface—that is, a freedom from glaze—but a smooth matt-surfaced paper does not give the effect we want.

With those papers which have lately appeared, and which are so prepared as to keep the image entirely on the surface, you still have the excessive and objectionable detail; and with other plain salted smooth papers, if you have not this brilliance, you have flatness—a dead, "sunk-in" look, which does not satisfy any one. But with a rough paper, properly prepared, you get a bright vigorous print, with the detail there, but so subdued and broken, so merged together, that it loses at once its untruthfulness, and represents, as nearly as it is possible to represent by photographic means, a natural and pictorial effect.

It is not necessary to take your negatives out of focus; there is nothing to be gained by it, for you can get all you want by simple printing. It is suitable to large or small work; suitable to portrait or landscape, though the very rough surfaces are not fitted to very small portrait work, whereas, in large subjects, they are most charming. You get, by their use, the nearest approach to the effects obtained by the painter, and though your picture is obtained by mechanical means, the mechanism is not apparent.

There are men who will argue that they are content with photography as it is; that, if they take a photograph, they want it to look like a photograph, and not like a painting, or a mezzotint engraving of a painting; [who have no appreciation of true art; who, though they call themselves artists, are nothing better than mechanics, and never will be; who, if they could take their photographs by putting a penny in the slot, would do it, and thank their patron saint for putting such a blessed convenience in their way. I cannot hope to convert such to the use of rough papers, but even they need not condemn them untried.

Mezzotype Paper.

It is my duty to point out to you that a paper to meet every artistic requirement is now prepared commercially under the name of mezzotype. It is not new, for it has been out nearly two years; but, as the manufacturers have advertised it only moderately, it has not attracted much notice. Still, it is rapidly growing in favour. There is not another paper made that will give you the same beautiful results as mezzotype. Try it for yourselves.

Many people having seen prints by their friends have endeavoured to obtain it from the local dealer and have failed, and, I regret to say, nearly all our business is done direct with the consumer, and we do not see how we can prevent this. The unfortunate dealer has, perhaps, burnt his fingers by a too implicit belief in the statements of manufacturers, and, having stocked inferior articles, has had them left on his hands. This naturally makes him shy of taking a new paper into stock, and it has been sought to damage the sale of plain salted papers by the statement that they will not keep. This is certainly not true of mezzotype, as it will keep as well as any other paper in the market. This is no mere assertion; I have letters to prove that its quality, so far from being impaired by keeping for twelve months, is actually improved for printing purposes. It will be enough now for me to state that those who are anxious to get rough-surfaced print-out paper cannot do better than use mezzotype. It is prepared at present in two surfaces, Nos. 1 and 2 (very rough and rough), and the Company are now in treaty with the manufacturers of the paper for a third and finer-grained surface. Those who prefer the grain of the Whatman drawing-papers can have them by ordering Whatman's Mezzotypes Nos. 1 and 2.

But it is not only paper for printing out that we prepare. The Whatman papers are prepared with a bromide emulsion for contact printing or enlarging, and are sold under the title of "Art Bromide Nos. 1 and 2," are most effective for enlargements, and give a grand surface to work on with water colour or crayons. Whether I shall be able to tempt you to use a rough paper remains to be seen, but it will be comforting to those men who seek greater refinement in their pictures to know where to get it. For goodness' sake, let us make an effort to get rid of the objectionable glaze. I am not in a position to lead a crusade against gloss, for I am interested in the production of its antithesis; but, apart from my position, I feel very strongly that, the nearer photographers can approach to natural effects, the greater the chance of photography being raised to the rank of the fine arts.

That there is still a great liking, a preference, indeed, for glazed surfaces, I admit. A short time ago I overheard a conversation between a photographer and his customer. It was in a cheap district. The sitter had wanted three prints in a hurry, and the photographer, not having good print-out light, had made them on bromide paper. But the customer was not satisfied; he said:—

"They ain't photygrafs."

"Why, it is an excellent likeness," said the artist.

"Dessay it is; but they ain't shiney enough. You'll have to shine 'em up a bit if you wants me to take 'em."

It would be no good showing mezzotype to such a one, for, like many an advocate of gloss and minute detail, he would be better pleased with a cheap chromo-lithograph than with a painting by Turner.

Chas. F. Robinson.

AMERICAN NOTES AND NEWS.

Eastman Papers.—The Rochester, N.Y., Eastman Kodak Company appeared to have scored a success in the "Express" amateur photographic contest just closed, in which thousands of amateurs throughout the States competed, as *every* first prize picture was printed on Eastman paper. The brands represented as bringing the coveted honours to the various competitors were the Standard bromide and the Solio papers. Full details are given in the *Buffalo Express*, but they would not prove of special interest to home readers.

The "Times" Calendar for 1894.—We are in receipt of the annual pictorial calendar issued by our New York contemporary, the *New York Photographic Times*. The art element in it, which is always attractive, consists this year of a chromograph, the scene of which is in Central Park. The whole is characterised by the usual neatness hitherto displayed in this useful New-year's present.

Hard Times.—Our old friend, G. Hanmer Croughton, so well known for many years as head artist for one of our principal Regent-street galleries, and now located in Rochester, N.Y., writes

in the *St. Louis and Canadian Photographer*, to which he is a valued occasional contributor, concerning the echoes of hard times and bad business coming from all over the country. With them are coming also echoes of all sorts of fakes and dodges to force business. "One of the oldest names among the photographers in this city is attached to a notice that cabinets will be made at a dollar a dozen for one week, which is understood not to be limited to seven days. Another states, in his specimen case, that he gives fifteen cabinets as a dozen; and, a few blocks further down the same street, still another photographer goes one better, and gives sixteen for the dozen." The amateurs have been blamed for this state of affairs, but, in Mr. Croughton's opinion, there are two sides to this question. The amateurs, in a large majority of cases, have taken up photography because they can give expression to their artistic tastes, whereas there are but very few professionals who have taken it up for that reason. The friends of these amateurs are mainly cultured people, who see at amateur exhibitions of what photography is capable, and demand it of the professional, and, if he cannot rise to the situation, he must go to the wall.

Colour Screens.—Writing in the *Times* on colour screens for use in orthochromatic photography, P. C. Duchochois says they consist of a collodion or gelatine pellicle, tinged by picric acid, curcumine, or, generally, by aurantia. The intensity of the colour should be that of lemon at the most; if deeper, it would depress considerably the action of the blue and violet, and these rays would, therefore, be rendered too dark.

Worthy of Imitation.—Mr. W. H. H. Clark, the Editor of the *St. Louis and Canadian Photographer*, is engaged this winter in giving a number of lantern-illustrated lectures, the proceeds from which are being given to the poor. This is most praiseworthy, and deserving of imitation.

A Method for Increasing the Contrast in Photographs.—"F. H. V.," in the *Scientific American*, says: "If the negative is very weak, print until the shadows are darker than is desired in the finished picture. Tone as usual, but bear in mind that under the following treatment the silver, not the gold, is dissolved, so that the finished print will have the appearance of having received further toning. After toning, immerse in the following, which should be made up fresh for each batch of prints:—Ferricyanide of potassium, one grain; water, sixteen ounces; nitric acid, thirty minims. Leave in this for from one to five minutes, according to the contrast needed. The time cannot be told accurately by the appearance of the prints. After removing, wash slightly, and place in fixing bath. In the fixing bath the prints rapidly become lighter. When fixed, wash as thoroughly as usual.

PLATINO-BROMIDE PAPER.

Since last week we have subjected the new Eastman Platino-bromide Matt Paper to a practical trial. It certainly bears out all that the Company claim for it. We exposed it in a printing frame to a gas flame, and developed it as we would an ordinary bromide. The whites are pure, the half-tones good and transparent, and the blacks very rich.

PHOTOGRAVURE.

[Abstract of paper read before the Central Photographic Club.]

The process I am going to demonstrate is that known as Klic's, which in reality is a modification of the Fox-Talbot process.

I do not consider it expedient for any one who is taking up photography in a small way only to do their own printing. I shall, therefore, not deal with the proofing of the etched plate, but, for the sake of simplicity, divide the manipulations involved in the production of the intaglio plate into five sections, of course assuming we have the negative of the subject we intend reproducing already made.

Section 1. From the negative a transparency is made. This can be obtained upon an ordinary dry plate, or produced by the carbon process.

Whichever method is adopted, the transparency should be fairly thin, of good gradation, and perfectly free from stain or other defects. If a dry plate is used for making the transparency, an exposure should be given in the camera in order to produce a reversed transparency.

To give you some idea of the character of the transparency most suitable, it should have a ratio of gradation of 1 to 6, as compared with the ratio of gradation of an ideal negative of 1 to 30; that is to say, a negative which will give absolute purity of the highest light, and absolute black in the deepest shadow upon silver paper.

If the carbon process is used, the negative must first be given a safe edge, *i.e.*, an opaque strip of paper, about a quarter of an inch wide, pasted round the edge of the negative. This is done in order to prevent the carbon film from frilling, and leaving the glass on development. The glass upon which the carbon transparency is to be developed must first be cleaned from all suspicion of grease, and then given a substratum. The substratum is:—gelatine, 1 oz.; water, 20; with sufficient bichromate of potash added to give it a pale cherry colour. The substratum can be dried by heat, or allowed to dry spontaneously. When dry, the coated plate is exposed to strong light for a few hours, to render it insoluble.

Section 2. Having obtained a suitable positive, the next process is to obtain a carbon negative from the transparency.

Standard brown tissue is suitable. Some prefer red chalk, in order to see the progress of the etching more plainly, whilst others, again, will tell you that special transparency tissue is preferable, by reason of the pigment being in a finer state of division. This carbon negative is subsequently developed upon the prepared copper plate (with which I shall deal in the next section), and forms the resist to the mordant, allowing the mordant to bite to a depth inversely proportionate to the thickness of the carbon negative. It will be found convenient to sensitise your own tissue; in fact, it is important you should, to enable you to obtain a smoother surface. The tissue is sensitised by being immersed in the following bath for three minutes. When in the sensitising bath, great care must be exercised to dispel all air bells, and the tissue is consequently brushed with a camel's-hair brush, both back and front, when in the bath.

The sensitising bath is

Bichromate of potash	7½ ounces.
Water	1 gallon.
Ammonia ·880	½ drachm.

Previously to placing the tissue in this solution, a piece of plate glass, perfectly free from scratches or other defects, is cleaned and well rubbed with talc. Upon this the tissue is placed on removal from the sensitising bath, a sheet of vulcanised rubber is laid on the back and well squeegeed in the ordinary manner adopted for imparting highly glazed surfaces to gelatine prints. The tissue must, of course, be dried in non-actinic light, or in the dark, at about a temperature of 70° Fahr. The exposure of the tissue to obtain the resist is short, since the transparency is so thin, the time being gauged by means of an actinometer. There are several actinometers in the market, but I prefer myself to use Johnson's without the yellow glass. Two tints, with a piece of albumenised paper for the transparencies passed round, is about the exposure necessary to obtain the carbon negative.

Section 3. Preparing the copper plate to receive the carbon resist.

The plate, which is pure copper, is received from the copper-plate worker ready planed and polished; there only remains a final polishing immediately before laying the ground. Plates for practising upon, quarter-plate size, and not bevelled, can be obtained at about 5*s*. per half dozen.

The polishing is accomplished with washed whiting and five per cent. ammonia solution, rubbed in a circular motion with a pad of cotton-wool till perfectly clean, showing no streaks or marks of any kind when held obliquely to the light.

The ground which confers on the plate the power of holding the ink is asphaltum, in a very finely powdered state. The asphaltum is applied by being shaken up in a box. The box is allowed to rest from thirty to sixty seconds before inserting the plate. The sooner the plate is placed in the box after the agitation of the asphalt the coarser will be the ground; a fine ground is obtained by allowing the box to rest for a longer period before inserting the plate. This grain or ground is set by the application of heat; for small plates a gas ring will answer the purpose, but for large plates a thick iron plate is heated and the copper plate laid upon it.

Setting of the ground can be seen to take place if the plate is held obliquely to the light when heated; the reddy-brown colour of the ground will gradually change to a steely blue. It must be immediately removed from the heat when this takes place, or a running together of the bitumen will result, rendering the plate useless for our purpose.

Section 4. Having the ground laid and tissue exposed, the next operation is to develop the tissue upon the copper. There is no great difficulty in this, but great care must be taken to prevent air bells forming and being imprisoned underneath the film, which would cause unetched patches in the plate. I have an example, showing the effect of air bells.

In order to avoid the air bells or reticulations as much as possible, it is advisable to use freshly boiled water for mounting the tissue. Ordinary tap water, especially where it is under high pressure, is fully charged with air, and, unless care be exercised to drive the air from the water as much as possible, great trouble will ensue. The plate having the bitumen grain helps the minute air bells to hang most tenaciously; therefore, when the copper and tissue are placed in the water a camel's-hair brush is passed over both the face of the copper and the tissue till perfectly free from air bells.

As soon as the tissue has relaxed its curl, and before it begins to curl in the opposite direction, the tissue is placed in the proper position on the copper while under the water, and both brought out together. A piece of rubber is laid over it and gently squeegeed. Not so much pressure must be brought to bear upon the squeegee as when an ordinary carbon print is being mounted, or the bitumen ground will pierce the tissue, and trouble will arise from that cause. As soon as the tissue is mounted it is blotted off and fanned to dry, not placed under pressure, or the drying may be unequal, which will probably produce unequal etching.

Development takes place in hot water at about 95° Fahr., which is gradually raised to 120° or 130° Fahr. Development must be thoroughly completed before being stopped. After development the resist is dried by the application of methylated spirits, or, if kept from dust, can be allowed to dry spontaneously.

Section 5.—A photogravure would be entirely spoiled in effect if it had no margin; therefore the copper must be protected from the action of the mordant round the margin and back of plate with black or asphalt varnish. This readily dries. When dry, the copper is ready for etching. To some it may appear a very difficult task to paint a straight edge with a brush and black varnish, the varnish not flowing very easily. A draughtsman's pen will be found convenient to rule round the picture, which can be painted up to afterwards with the brush. To those not possessing a steady hand even this will give some little trouble. The following method will perhaps be found more simple, and is as equally effectual as any other method.

Cut a mask of opaque paper one-eighth of an inch smaller each way than the picture; stick this in the centre of a clean piece of glass, and upon the other side of the glass, about one-eighth of an inch outside of the centre mask which protects the picture, paste another piece to protect the safe edge. After the tissue has been exposed and removed from under the positive, place the tissue under this mask and again expose for a short time; the effect of this will be to give an opaque edge or margin to the picture through which the mordant will not penetrate. Thus having a line about one-eighth of an inch wide no difficulty will be experienced in painting up to with the varnish. The etching fluid is a solution of perchloride of iron. The more concentrated the solution the less action it has upon the plate, consequently we have five solutions of various strengths. We start by making a saturated solution of the iron, and diluting till it reaches a specific gravity of 43°; this is ascertained with the aid of a Beaume's hydrometer for heavy liquids. We have to make five solutions showing on the scale of the hydrometer, and numbered respectively 43°, 40°, 38°, 36°, and 33°. During etching the solutions should be about 70° Fahr. The process of etching will generally occupy from five to eight minutes. The etching may sometimes take longer, and in some instances it may be found necessary to still further dilute 33° solution in order to etch the higher lights. As soon as the plate has been sufficiently etched, it must be immediately removed and the action of the mordant arrested by placing the plate into a solution of caustic potash, thus converting the etching fluid into ferric-hydrate. No time must be lost in removing the plate from the etching solution as soon as the high lights are beginning to etch, or your picture will be flat with degraded lights. When you arrive at this stage the action is very rapid; you should therefore be in a good light. The resist is removed by being rubbed under the tap, and the bitumen ground and black varnish removed with first benzole, then turpentine, and finished off with methylated spirits.

The plate, after being cleaned with whiting, is ready for proofing. If, on proofing, the plate is slightly over-etched, it will require burnishing; or, if, on the other hand, the shadows require a little more depth, the roulette is called into requisition.

There remains one other operation, viz., steel facing; but, if you are only working in a small way, it will be more expedient to get this done at a steel facer's. If, however, a few copies, say fifty, are only required, it will not be necessary to have the plate steel-faced. A word or two here as to the subject most suitable to commence with will not be amiss. It will be obvious to you all that a subject possessing one or two tones only will be far easier to etch than a subject possessing a long range of very delicate half-tones, such as the plate I will pass round. It is therefore recommended that a start should be made by copying an etching with fairly bold and distinct lines rather than with a half-tone negative. The apparatus and materials required (provided you do not proof your own plates) will mostly be found in use in every photographer's workroom. I will give a list of the things required, which are not so likely to be in general use:—A dusting box. The area of the bottom of the box should at least be three times each way the size of the largest plate to be dusted to ensure even graining. Copper plates, a burnishing tool, a roulette, hydrometer, asphaltum, perchloride of iron, asphalt varnish, washed whiting, benzole, and turpentine. J. H. Gear.

PHOTOGRAPHIC DEALERS AND THE PHARMACY ACT.—IMPORTANT DECISION.

On February 1 an action was brought, in the Liverpool County Court, before his Honour Judge Shand, against F. Lloyd, optician and dealer in photographic materials, South John-street, to recover a penalty of 5*l.* under the Pharmacy Act of 1868. Mr. Watkins appeared for the defendant, and Mr. R. T. Grey represented the Pharmaceutical Society who were plaintiffs in the matter. Mr. Grey explained that a man named Kelly went, at the instance of the plaintiffs, to the defendant's shop and asked for two ounces of cyanide of potassium, one of the most formidable poisons known to chemists. A fatal dose was a little over five grains, so that in the two ounces which were supplied to Kelly, and paid for by him, there was poison enough to kill 192 people. Kelly paid 2*d.* per ounce. Mr. Watkins admitted that the defendant was not registered under the Pharmacy Act, but he contended that the defendant did not keep o pen his shop for the purpose of selling the poison. The Judge pointed out that, under the Act, it was an offence to sell. Mr. Boom, from the Pharmaceutical Society, in cross-examination, said that the Society did not give notice to photographic dealers that the sale of poisons was illegal. The Judge remarked that it seemed to him that one of the duties of the Society was to prevent the sale of poisons with which people might destroy their own lives or the lives of others. Mr. Watkins: But the practice of this Society is to single out one or two people in the hope they would pay the penalty, and no doubt they make a good thing out of it. Mr. Grey: I strongly object to that statement. It is not the practice of the Society at all. Mr. Watkins called the defendant, who said he had sold cyanide of potassium for photographic purposes during the two years he had been in business to about ten persons. He knew it was a poison, and sold it only to persons who he believed would use it *bonâ fide* for photography. He believed all photographic material dealers sold it. He had done so in ignorance of the Pharmacy Act, which he had not seen until a week ago, and since then he had made up his mind to sell no more. The Judge said it was clear that an offence had been committed, since the defendant admitted having sold the stuff. Mr. Watkins urged in extenuation that no notice had been given to his client of the illegality of selling, and condemned the practice of the Society of "dropping" upon people all over the country and obtaining penalties.

His Honour said he could see no answer to the case, and gave judgment for the plaintiffs for 5*l.*, with costs.

ON THE PRODUCT OF THE ACTION OF MERCURIC CHLORIDE UPON METALLIC SILVER.

[Journal of the Society of Chemical Industry.]

When a solution of mercuric chloride is caused to act upon a silver photographic image, whether in gelatine or collodion film, the metallic silver is changed into a white substance which has been supposed to be a mixture of mercurous and silver chlorides. So far as I am aware, the properties of this substance have never been ascertained; it has been taken for granted that it is a mixture, and that its behaviour is simply that of a mixture of the two chlorides. I think, however, that the facts given below leave no reasonable room for doubt that it is a double chloride formed by the reaction $HgCl_2 + Ag = HgAgCl_2$.

Preparation.

The preparation of the substance in bulk at first presented considerable difficulty. Silver foil 0·03 mm. thick. after remaining in a saturated solution of mercuric chloride for three years, was found to be rotten, but when heated to volatilise the mercury and fuse the silver chloride, it showed that a considerable portion of unattacked silver remained. The attacked foil, when warmed with strong nitric acid to dissolve out the metallic silver and the mercury compound, left a residue of silver chloride, which was white and in just the same form and with the same surface marks as the foil.

By the use of silver in a pulverulent condition, as, for example, when reduced from its solution or from the chloride by means of grape sugar in the presence of caustic soda, or by ammonium sulphite in the presence of ammonia, the reaction is facilitated, but still slow. A quantity of silver reduced from the nitrate by means of ammonium sulphite, by rapidly heating the solution in small quantities to prevent the production of large particles, was mixed with a considerable excess of solid mercuric chloride and sufficient water to make a thin paste of it. The mixture was shaken up well at frequent intervals and occasionally ground in a mortar, yet after three weeks it was still slate-coloured. After standing for three months it was of a light grey colour; fourteen months from the time when the reaction commenced the mass was creamy white, but speckles of unattacked silver were still visible; and after two years a sample of the preparation, after washing and drying, was found to contain more than 3 per cent. of silver in the metallic state. It is possible to get a fairly pure product by working entirely in the cold, if the product of the reaction is separared from the unattacked silver by elutriation. A sample so obtained from another preparation gave 37·75 per cent. of silver chloride, theory requiring 37·85 per cent., and this was separated only three weeks after the mercuric chloride and silver were brought into contact.

After trying many modifications that have suggested themselves for the

preparation of silver mercurous chloride, the best that I have been able to discover is to add to the pulverulent silver a considerable excess of mercuric chloride made into a thin paste with water, to agitate the mixture frequently and occasionally to grind it in a mortar, for two or three weeks, and then to introduce it into a long-necked flask or bolt-head and head it in a water bath from 12 to 20 hours. The mass is then mixed with a considerable quantity of water, and, as soon as the chief part of the excess of mercuric chloride has settled down, the supernatant turbid liquid is poured off. By repeating this operation a comparatively small quantity of the preparation will be lost with the part that remains behind. The mercuric chloride crystals remaining greatly facilitate the retention of the particles of unattacked silver. The product rapidly settles from the water, and it is thoroughly washed and dried in a steam oven. A preparation which contained, after cold digestion, over 3 per cent. of unattacked silver, contained 1·84 per cent. after seven hours' heating in a water bath, 0·55 per cent. after another seven hours' heating, and 0·27 per cent. after elutriation as described. I have tried heating in a sealed tube instead of in an open vessel, but this variation appears to offer no advantage.

An attempt to prepare this substance by direct precipitation with hydrochloric acid from a solution containing silver and mercurous nitrates was unsuccessful. Under these conditions the silver chloride is first thrown down, carrying with it a very small proportion (about a half per cent.) of mercurous chloride. Before all the silver is precipitated the mercury comes down in quantity. Three consecutive fractions contained respectively 5·35, 63·52, 92·97 per cent. of mercurous chloride. There seems, therefore, to be a tendency for the two salts to combine, and it would obviously be possible to prepare a solution that would yield a certain amount of the double chloride, or of the two chlorides in the same proportion.

Analysis and Properties.

The readiest method of analysing silver mercurous chloride is by simple ignition, when the mercurous chloride is volatilised and silver chloride remains. The silver chloride must be perfectly fused, but this is not likely to lead to any loss if nothing hotter than an ordinary Bunsen flame is employed. Any unattacked metallic silver in the preparation remains as chloride, its equivalent of metallic mercury passing off. The percentage of metallic silver in the preparation, provided of course that it is properly washed and dried, is the same as the silver chloride found in excess of 37·85 per cent., the amount in the pure double salt, provided that not more than 1 or perhaps 2 per cent. of metallic silver is present. It is a curious coincidence, and saves a rather tedious calculation.

I have not been able to find any method of estimating the metallic silver present with the double salt directly, but the indirect method given above appears to be quite satisfactory. To make quite sure that metallic silver is converted into chloride as stated, I have proved the absence of metallic silver in the residue left by ignition, and also that metallic mercury is given when metallic silver and silver mercurous chloride are warmed together at as low a temperature as 100° to 110° C. Into three tubes were introduced respectively silver mercurous chloride containing only 0·27 per cent. of metallic silver, mercurous chloride ground up with pulverulent silver, and mercurous chloride alone, all the substances being carefully dried. Some gold leaf was secured in the upper part of each tube and the lower ends were then heated in a glycerine bath. After seven hours not only was the gold leaf in the first and second tubes perceptibly whitened, but a good deposit of mercury globules was visible by means of a microscope. In the third tube there was no free mercury.

It follows from this action of metallic silver on silver mercurous chloride, that a sample of the double salt containing an appreciable amount of metallic silver will not give a constant weight when heated (for drying) in the water oven.

The specific gravities of silver chloride, mercurous chloride, and the double chloride have been determined, with the following results :—

—	AgCl	HgCl	Calculated Specific Gravity of a Mixture in Equivalent Proportions.	Specific Gravity of $HgAgCl_2$ Experimentally Found.
1.	5·583	7·248	6·610	6·493
2.	5·572	7·235		6·489
3.	5·590	7·253	6·626	6·505
4.	5·590	7·264		

These specific gravities are at 20° C., and compared with water at the same temperature. In the first and second series the air was got rid of by boiling the substance with water before introducing it into the bottles, while in the third and fourth the bottles containing the substance and water were put under a receiver, which was exhausted until the water boiled at the ordinary temperature. The figures in the last two series are a little higher than the others and probably more correct. The considerable difference between the calculated and found specific gravities appears to indicate that the two chlorides are not merely mixed, and if the small amount of metallic silver in the double chloride has any effect its removal would increase this difference.

As the specific gravities of the two single chlorides are very different, one would expect a partial separation of them if merely mixed, when allowed to settle down from suspension in water. To test this a quantity was agitated in a long tube full of water and allowed to settle, the deposit being seven inches deep. The top layer and the bottom layer were separately dried and gave on analysis exactly the same figures.

The double chloride is slowly affected by exposure to light, a small quantity in a sealed tube exposed in a window with west aspect from February to November last year being changed superficially to a salmon colour. Moisture facilitates this change. A piece of caustic potash enclosed at the top of the tube retarded the change, and the colour was grey, and this was the same whether the tube was rendered vacuous or not. When magnified from 10 to 20 diameters the colour appears discontinuous. It is possible that the small amount of metallic silver present furnishes centres of comparatively instability. In the dark the substance does not change colour.

Action of Metallic Silver and Mercury.

As already stated, metallic silver, when heated with silver mercuric chloride, retains some of the chlorine, which otherwise would escape as mercurous chloride. An excess of metallic mercury has an analogous action, carrying off with it some of the chlorine, which otherwise would remain as silver chloride.

Action of Ammonium Chloride.

A cold saturated solution of ammonium chloride was employed. When brought into contact with the substance a slight darkening was apparent; but, on standing for a day, the colour did not further increase. On boiling, the action was fairly rapid, and a residue of metals was left, the solution giving a copious deposit of silver chloride on cooling. A weighed quantity of the double chloride was heated with repeated quantities of the solution, each heating being only of a few seconds' duration, the solution being immediately poured off from the residue to prevent reaction between the metals precipitated and the constituents of the solution. The atomic proportions of the silver and mercury were :—

	Residue.	Solution.
Silver	1·00	2·00
Mercury	0·96	1·85

The silver in solution being as chloride, which separated almost entirely on diluting and cooling, and the metals in the residue being in the metallic condition. The change may therefore be expressed thus :—

$$3HgAgCl_2 = Hg + Ag + 2AgCl + 2HgCl_2$$

The ammonium chloride probably forms double salts with both the chlorides. The deficiency of mercury is due to its volatilisation during the boiling in order to get the reaction, for both metallic mercury and mercuric chloride in solution are markedly volatile at 100° C.

A quantity of silver mercurous chloride was digested with ammonium-chloride solution in a sealed tube at 135° to 140° C. Two or three hours apparently produced a complete reaction; to make sure, the heating was continued for five hours. The atomic proportions found were :—

	Residue.	Solution.
Silver	0·82	2·18
Mercury	1·28	1·69

The silver in solution had mostly crystallised out as chloride before the tube was opened. It is evident that under these conditions, when the dissolved metals are not removed, some of the silver from the residue dissolves and some of the mercury from the solution is precipitated.

But the mercury precipitated is considerably in excess of the quantity equivalent to the silver dissolved. This anomaly can hardly be due to analytical error, because 99·75 per cent. of the total silver and 99·35 per cent. of the total mercury taken for the reaction are accounted for, and the anomaly also occurred in another similar experiment, in which more than a half of the silver normally present as metal in the residue had changed into chloride. CHAPMAN JONES.

(*To be continued.*)

FORFARSHIRE PHOTOGRAPHIC ASSOCIATION,

LANTERN-SLIDE COMPETITION AND EXHIBITION.

THE management of the Forfarshire Photographic Association, whose Exhibition proved such an attractive novelty last summer, have just promoted a slide competition. The *modus* adopted has been to invite by circular all the best-known photographers in the United Kingdom to send sets of twelve slides for competition, and the winning slides, which become the property of the Association, were exhibited in the Reid Hall on the evening of Monday, February 5. The slides for competition were all sent to the Secretary, Mr. W. J. Anckorn, Arbroath, who had them numbered and sent to Mr. Adam Diston, Leven, Fife, one of the Judges at the summer Exhibition, who, at his own residence, adjudicated upon them and awarded the prizes—silver and bronze medals—to the best slides, identifying them by the numbers attached to the respective sets.

Mr. Diston, in his report, says: "I have looked over the slides most carefully, and have much pleasure in giving it as my belief that the standard of workmanship is, as a whole, very high indeed. So much has this been so, that I have experienced some difficulty in making the awards. In my opinion however, the slides awarded are really those which are most deserving from an artistic as well as a technical point of view. I have given the awards for certain slides in the set selected."

Class I.—(Set 1), silver medal, A. R. Dresser, Bexley Heath, Kent; (Set 5), bronze medal, T. M. Brownrigg, Guildford, Surrey; (Set 9), bronze medal, Charles Reid, Wishaw, N.B.; honourable mention (No. 6), T. F. Lloyd, Liverpool; (No. 17), R. B. Don, Broughty Ferry.

Class II.—(Set 2), silver medal, S. H. Courthurst, Manchester; (Set 1), bronze medal, A. R. Dresser, Bexley Heath, Kent.

Class III.—(Set 3), silver medal, A. R. Dresser, Bexley Heath, Kent; (Set 2), bronze medal, Mr. and Mrs. Anckorn, Arbroath, N.B.

In passing we learn that Mr. Anckorn has been awarded the medal of the Photo Club of Paris, his pictures having passed a board of artists before they could be exhibited.

ON THE PHOTOGRAPHY OF THE LUMINOUS RAYS OF THE SHORTEST WAVE-LENGTHS.*

The Absorption of the Most Refrangible Rays of Aluminium, Nos. 30, 31, *and* 32.

A. *In Quartz.*—The observation was effected exclusively by means of photography. The absorption spectra were taken by means of the above-named spectroscopic apparatus, with a focal distance of 150 mm. on highly sensitive plates (Zettnow). The source of light was a Leyden jar spark of the above-mentioned inductorium, 25 cm. in length, striking between aluminium wires. Some photographs were also taken of the light of a tungsten spark, which is particularly suitable for absorption experiments on account of the uniformity of the distribution and the efficiency of its rays. The quartz plates the absorption of which was to be determined had been cut at right angles to the principal crystallographic axis, and their thickness was 3·3, 3·6, 5·2, 20, and 50 mm. Their absorption was ascertained as follows:—

I covered the aperture of the collimator slit with the plate in question and then took (increasing constantly the time of exposure) a series of photographs of the aluminium spectrum placed below each other. I then removed the plate from the slit and repeated the series either with the same time of exposure or with one proportionately abridged. The difference between the two series showed then the absorption of the rays in question in the quartz plate selected. For demonstrating very small differences of such parallel photographs, and also where the inevitable small fluctuations of the luminosity of the source of light have to be taken into account, both spectra were photographed simultaneously. For this purpose I covered the slit for half its length with the quartz plate, whilst the other half of the slit was freely traversed by the rays. I thus obtained on each exposure two spectra separated from each other by a very narrow stripe of light, derived from the lateral surface of the quartz plate. The differences of these spectra are due as before to the absorption of light in the quartz plate.

* Continued from page 835 (1893).

It is found on comparison that in such proofs all distinctions come more sharply to view than in those where the photographs are successively brought into the field of vision. For thicker plates this process is less suitable, since the breadth of the stripe of light increases with the thickness of the plate and becomes ultimately wider than the object of the photographs admits. The loss of light which the rays undergo by reflection from the plane parallel surfaces of the quartz plate was so trifling in my proofs that it could be disregarded without injury to the trustworthiness of my result. VICTOR SCHUMANN.

(*To be continued.*)

Our Editorial Table.

PHOTOGRAPHISCHER ALMANACH UND KALENDAR, 1894.

Dusseldorf: E. Liesegang.

LIESEGANG'S CALENDAR for 1894 has reached us. As frontispieces it has half-tone portraits of the brothers Auguste and Louis Lumière, and, in addition to other illustrations, includes a number of practical articles and a selection of formulæ.

LES INSUCCÈS DANS LES DIVERS PROCÉDÉS PHOTOGRAPHIQUES.

Par L. MATHET. Paris: Charles Mendel, Rue d'Assas.

M. MATHET'S work is divided into two small volumes, one dealing with failures in the preparation of negatives, the other in positive printing. They are written throughout in a clear and simple style, and are fairly exhaustive. M. Mathet is one of the most practical contributors to the French photographic press, and is always worth reading.

BROMIDE PAPER.

By DR. E. A. JUST (Vienna). Third edition.

THIS excellent manual, which is published by Percy Lund & Co., Bradford and London, is a translation from the German by Messrs. Walter E. Woodbury and H. Snowden Ward, and, as such, reflects credit upon the linguistic capabilities of these gentlemen. It is devoted to giving instructions both for contact printing and enlarging, and cannot fail to be useful.

News and Notes.

SOCIETY fixtures for next week will be found under the heading of "Meetings of Societies."

THE Imperial Dry Plate Company are introducing a new printing-out paper called "Kloro" paper.

LEYTONSTONE CAMERA CLUB.—February 10, Open Social Evening at Headquarters at eight o'clock.

CENTRAL PHOTOGRAPHIC CLUB.—To-night (Friday) the 9th inst., a demonstration of the carbon process will be given by Mr. Birt Acres.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Annual General Meeting, Tuesday, February 13, at eight p.m., at 50, Great Russell-street, W.C.

TO-NIGHT (Friday) Prof. Weldon lectures at the Royal Institution on *Fortuitous Variations in Animals.* Mr. T. Fall's well-known animal studies will be shown.

WE have to acknowledge the receipt of a neat calendar for 1894 from Messrs. M'Ghie & Co., 75, St. Vincent-Square Glasgow. On it is mounted a photogravure (by Annan & Sons), of the Hon. Mrs. Graham, from the painting by Gainsborough.

REFERRING to Mr. Maskell's notice of the Paris Photo Club Exhibition in our last number, where it is mentioned that the galleries were small, inconvenient, and badly lighted, we understand that for the Exhibition next year a larger and more suitable gallery in the same building has been secured.

"THE MANUAL OF PHOTOGRAPHY."—Mr. A. Brothers writes: "Permit me to correct the reply given to Thos. Blinkhorn in the last issue of THE BRITISH JOURNAL OF PHOTOGRAPHY. Messrs. Chas. Griffin & Co. are the publishers of the *Manual of Photography*, and not Messrs. Crosby Lockwood & Co."

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The first Bohemian Concert given by the above Society was held at the Montpelier Hotel, Choumert-road, Peckham, on Monday, January 29. Among the artistes were the following:—Miss Eva Hammond, Mr. and Mrs. Harry Briden, Mr. Crabtree, Mr. Crafter, Mr. Durden, Mr. Fellows, Mr. Hillier, Mr. Marsden, Mr. Miles, Mr. Billy Reeves, Mr. G. Slater, Mr. Sidney Smith, and Mr. Whitly. Between thirty and forty songs were got through, under the direction of Mr. J. T. French. Miss French and Mr. A. E. Fellows acted as accompanists.

MR. A. SQUIBBS, of 38, Fore-street, Bridgwater, writes: — "Will you allow me to warn professional brethren against a man about five feet four

inches in height, light brown or fair hair, rather wavy, with three or four grey ones interspersed; moustache, tendency to ginger, rather heavy, no whiskers or beard; full grey eye, and dressed in a shabby suit of check clothes and black bowler hat; calls himself a photographer, but offers to canvass for orders rather than starve, working his way to Cardiff. After pleading with a piteous tale, I fed him, lent him money, and an opal specimen to work with. He vanished directly after."

THE Exeter Amateur Photographic Society's Exhibition will be held in the Art Gallery of the Royal Albert Museum, Exeter, on Monday, Tuesday, and Wednesday, March 26, 27, and 28, 1894. Twenty-one medals will be placed at the disposal of the Judge, as follows:—Members' Section, 5 silver and 5 bronze. Open Section: A, General Work, 4 silver and 4 bronze; B, Lantern Slides (6 in set), 1 silver and 1 bronze; C, Champion Class, 1 special silver medal. The Committee specially invite stereoscopic, astronomical, photo-micrographic, and other scientific exhibits, in Section A. Entry forms must be sent, together with the entrance fee, to the Hon. Secretary, on or before Wednesday, March 14. The Hon. Secretary is the Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.

OPTIMUS PRIZE COMPETITION.—In a recent number we spoke of the results of the 100*l.* prizes awarded by Messrs. Perken, Sons, & Rayment for pictures taken during the past year by their lenses. These pictures, to the number of two hundred and fifty or thereabouts, are now on view at their premises, 100, Hatton-garden. They are of various dimensions, ranging from quarter-plate to 12×10 taken direct, and enlargements of considerable magnitude. There are only a limited number of portraits, the others being *genre*, landscapes, and seascapes. As it is very seldom that one has an opportunity of examining such a large collection of really fine photographs, we recommend such of our readers as have time and opportunity for doing so to call at the address given and witness for themselves this exhibition.

CHICAGO AWARDS.—There has been an unprecedented delay in announcing the awards made at the Chicago Exhibition. No list of awards has yet been issued, and it seems quite uncertain when one will be. Many awards have been announced, but none have as yet been officially confirmed. Sir Henry Wood has, however, at different times, received information, from which it appears that about 1400 awards have been made in the British Section. Of these, 836 were in the industrial departments of the Exhibition, and were divided among 449 exhibitors. The total number of industrial exhibitors was 597. Of 501 exhibitors in the Fine Arts Department, 132 received an award; of 1138 exhibitors in the Women's Work Section, 173 received among them 229 medals; 180 awards went to Indian manufacturers represented at Chicago either independently or in the Indian Pavilion; 54 awards went for British exhibits (like Mrs. Ernest Hart's Donegal village) not under the jurisdiction of the Royal Commission. The lists from which the above statements are collected, it is understood, are liable to modification, so the figures must only be regarded as approximative. In Paris, in 1889, 926 awards were distributed among 1017 exhibitors.

PHOTOGRAPHIC CLUB.—PRESENTATION TO MR. F. A. BRIDGE.—On Wednesday, January 31, the annual Lantern and Musical Entertainment of the Photographic Club was held at Anderton's Hotel, Fleet-street. Mr. Frank Haes (a trustee of the Club) presided, and a very large number of ladies and gentlemen were present. The entertainment, which was under the direction of Mr. F. A. Bridge, included a selection of part music by some members of Mr. Henry Leslie's choir, many charming numbers being admirably rendered. The Rev. Richard Hill recited "Shemus O'Brien" in fine style, Mr. Bridge gave (in costume) the Judge's song from *Trial by Jury* with his usual force and ability, and Mr. E. W. Parfitt and others also contributed to the programme. A large number of lantern slides by Messrs. Haes, Sinclair, Chang, Hunt, Sanford, Medland, Bridgman, Bridge, Benham, Troup, Mrs. Catherine Weed Ward, Messrs. Bynoe, Newell, Tottem, Wellington, and Williams were shown, Mr. Edgar Clifton ably officiating at the lantern. During the interval Mr. Haes, on behalf of members of the Club, took occasion to present Mr. Bridge with a gold watch on his retirement from the secretaryship of the Club. Mr. Haes said: "The pleasing duty now devolves on me of asking you to accept from members of the Photographic Club a small testimonial on your relinquishing to-night the duties of our Hon. Secretary, as a slight mark of our appreciation of the way in which you have so ably fulfilled this office, and also as a token of the esteem and warm regard we all entertain for you. Your unfailing attention to the best interests of the Club and your unvarying courtesy have been fully valued by us, and, although from to-day you cease to act as the most important officer of the Club, we hope and trust you will be amongst us as often as hitherto, to give us the benefit of your advice and experience. It is to us an additional pleasure that this gift should be made publicly before so many of our friends and members." At the conclusion of Mr. Haes' address three hearty cheers were given for Mr. Bridge, who said: "My dear Mr. Haes, fellow-members of the Photographic Club, ladies and gentlemen. There are in the lives of most people certain days which may be called 'red-letter' days, days which stand out from the rest in bright relief on account of some pleasant reminiscence being connected with them. Among these, in my calendar at any rate, will in future be January 31. I am rather glad of this, because the only matter of any importance with which I was connected, which took place on that date, was anything but satisfactory. Henceforth, however, the shadow left on January 31 by this unpleasant recollection will be cleared away, and in its place there will be a bright red line recalling the happy incident of this evening. I am glad also that the Ladies' Night has been chosen for this presentation, because many years ago, in my early connexion with the old South London Photographic Society, it was at my suggestion that on the annual Ladies' Night the programme should consist not only of a lantern exhibition, but that it should be a lantern and musical entertainment. For many years this suggestion was carried out, and the last meeting ever held by the old South London Photographic Society was a lantern and musical entertainment. Later on, the Photographic Club (which practically grew out of the old South London) took to having an annual lantern and musical entertainment, and at the present time at least one other London Society has followed our example. Just as, many years ago, I realised that there were few things in which we could be engaged which would not be better for the support and co-operation of the ladies, so it is now, and I want the ladies present on this occasion to assist in confirming this. I know they have an idea that certain days are best or most suitable for certain purposes, whether they are the very important episode of getting married, or the less noticeable but very necessary operation of supervising the family washing, and, as it is with these little domestic matters, so it is with photography. There is a time and place for everything, and although I do not for one moment contend that photography cannot be discussed on any day of the week, still, I should like to impress upon them that the proper time to discuss photography is Wednesday evening, and the proper place, Anderton's Hotel. Therefore, ladies, when your husbands leave home on Wednesday mornings, and you assist them on with their overcoats, hand them their nicely brushed hats, and pull out the corner of their handkerchiefs from their breast pockets, don't drop your lip and say, 'Late again to-night, I suppose' (I'm not, of course, saying you do; I'm only saying, 'Don't), but say, 'Let's see, dear, this is Club night. Well, don't be later than you can help, and I'll have a nice hot supper ready for you;' and, when he comes home in the evening, you can discuss the hot supper and photography together, and I'm sure you will both be better for it. But I must not detain you, as our time is limited. With regard to this handsome present, it is extremely kind of the members. I'm very much obliged to them, and I shall prize it most highly. Anything I can do for the Club I shall always be pleased to do. Long may it live, may its shadow never grow less, and may I for many years have the pleasure of forming part of the substance that makes that shadow." The entertainment then proceeded. The watch has Mr. Bridge's initials engraved on the outside, and on the inside of the case is inscribed, "Presented to F. A. Bridge, by members of the Photographic Club, 1894." It should here be mentioned that the Testimonial Committee consisted of Messrs. J. Weir Brown, A. Bridgman, Thomas Bedding, E. W. Foxlee, Frank Haes, J. Nesbit, E. A. Newell, H. W. Sanford, and G. W. Tottem, Mr. J. W. Zaehnsdorf acting as Honorary Secretary with characteristic energy so that the organization of the testimonial was successfully carried through in a few days.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
12	Camera Club	*Bees and Bee-keeping.* A. A. Watkins.
12	Lantern Society	
12	Norfolk and Norwich	
12	Putney	
12	Richmond	
13	Birmingham Photo. Society	
13	Camera Club	*Retouching*, with Illustrations. Redmond Barrett.
13	Great Britain	Annual Meeting.
13	Hackney	*Architectural Photography.* J. H. Avery.
13	Manchester Amateur	
13	Newcastle-on-Tyne & N. Counties	
13	North Middlesex	Lantern Exhibition. B. Acres.
13	Paisley	
13	Rochester	
13	Stockton	
13	West London	Annual Exhibition.
14	Croydon Camera Club	Public Lantern Display.
14	Ipswich and Suffolk	
14	Leytonstone	Lantern Evening. Mrs. C. W. Ward.
14	Munster	
14	Photographic Club	*Makeshifts.*
14	Southport	
14	Stockport	
15	Birmingham Photo. Society	
15	Camera Club	*Plea for Serious Work in Photography.* E. J. Humphery.
15	Glossop Dale	
15	Greenock	
15	Hull	
15	Leeds Camera Club	Lantern Night.
15	Liverpool Amateur	*Carbon Process.* W. T. Wilkinson.
15	London and Provincial	*Are Saturday Outings a Success?* E. H. Bayston.
15	Oldham	
15	Oxford Photo. Society	
16	Cardiff	
16	Central Photographic Club	*Japanese Views by Native Artists.* D. S. Brearley.
16	Croydon Microscopical	Lantern Evening.
16	Holborn	
16	Leamington	
16	Maidstone	
16	North Kent	
17	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 1, Mr. J. J. Briginshaw in the chair.

ROUGH PAPERS.

Mr. CHARLES F. ROBINSON, of the Carlotype Company, Rainham, read a paper on this subject [see page 84]. He exhibited a large number of prints on mezzotype paper (his firm's manufacture) in various degrees of roughness, some toned with platinum, others in the borax bath, and others in a palladium bath. Answering questions, he said the paper was not an emulsion paper. A sheet 28×20 contained seventy grains of silver nitrate. As to the keeping properties of the paper, it had been known to keep well for a period of two years. The platinum bath gave good blacks, the prints drying darker than they appeared when wet.

After other discussion and questions, a vote of thanks was passed to Mr. Robinson for his paper.

Central Photographic Club.—On Friday last, February 2, a demonstration in *Photogravure* was given by Mr. J. H. GEAR [see page 86]. In opening the demonstration, he remarked that competent workers of the process were very few in England, and a very substantial sum is asked by them for imparting information on the subject. The process chosen for illustration was that known as the Klic, a modification of the Fox Talbot. Questions on various details were asked, and were answered by Mr. Gear. Mr. W. H. BARNES exhibited and explained Edwards's new dark slides, very portable in size, an adapter for use with the same, and also some patent film-carriers.

Croydon Camera Club.—An interesting series of demonstrations on development were given on 31st ult. by Messrs. White, Corden, and J. Smith. The first-mentioned illustrated the compensating power of the process of development applied to under and over-exposed plates; the first-mentioned, with a constant exposure (slow snap-shot), exhibited the action of a number of different developers applied to as many different plates. Pyro soda gave a negative of printing density in five minutes; metol (maker's formula) took twenty minutes; amidol and the other developers tried failed to produce satisfactory results. The plates experimented on were slow Ilfords, and were underexposed in a weak light.

Croydon Microscopical and Natural History Club (Photographic Section).—February 2, *Hints on Uranium Toning*, by Mr. J. WEIR BROWN. Since the process had last been brought before the Club on its introduction in 1890, several difficulties which militated against success had been overcome. The chief improvement was the addition of acetic acid to the toning bath, which now kept in working order, whilst the uranium deposit on the print was rendered insoluble in the after-washing in water. Before toning, the hypo should be entirely eliminated from the print, or red stains would result; and, if iron development had been employed, all the iron should be removed, or blue stains would occur. When the desired tone was reached, the prints were washed in running water for five minutes to remove the lemon colour in the high lights, taken out, and all the surface moisture removed, and then allowed to dry. By a modification of the process, a Bartolozzi red-coloured image could be obtained, giving beautiful results when used on large heads, portraits, &c. A bromide print was developed till fogging occurred, toned to deep red, and then placed in Farmer's reducer (ferricyanide and hypo) till all the silver was dissolved, leaving the image in uranium only behind it. The working of the process was demonstrated by Mr. Brown, and appeared remarkably easy, the cold black of the bromide being replaced by a rich brown, which was very pleasing. A number of prints which were prepared on the introduction of the process were shown. These showed no change, and were as good as ever, and established a claim to permanency for the process.

Ealing Photographic Society.—A special and particularly interesting meeting of the Ealing Photographic Society was held in the Victoria Hall on Thursday evening, when a departure was made from the usual practice of this Society. The meeting was held in the large hall, and a small charge was made for admission (sixpence), the proceeds to be given to the Photographers' Benevolent Association. In spite of the inclemency of the weather, there was an unusually strong muster of members and friends to witness a series of lantern slides by Mr. CHARLES WHITING, a member of the Society. The views, which were of a very high order of merit, and some of the best exhibited at the various meetings of the Society, were accompanied by a running comment by Mr. Whiting, explanatory and technical. They were very comprehensive, and were divided into groups. Views of places on the south coast, including Hastings, Bournemouth, Dawlish, Teignmouth, Winchelsea, Christchurch, &c., were first shown, and were followed by views of places of historical interest, comprising Canterbury, with its cathedral, and Shakespeare's country—including views of Stratford-on-Avon old market-place, the Shakespeare Memorial Fountain and Theatre, and Ann Hathaway's Cottage. (These views of Shakespeare's country were explained by Mr. Simpson.) A very pleasant evening was brought to a close by the exhibition of some fifty views of Ealing and neighbourhood, taken by Mr. Whiting for the Woodburytype Company, and exhibited by their permission. Mr. H. W. PEAL, the President of the Society, in eulogistic terms, proposed a vote of thanks to Mr. Whiting, not only for the time and trouble he had devoted to that evening's proceedings, but also for the practical aid he had rendered to the Society, notably in the designing of the enlarging lantern, which had become such a popular feature of the "dark room." Mr. Whiting responded to the compliment, after which the proceedings terminated. Mr. and Mrs. W. E. Kellik were elected members of the Society, and the following were proposed for membership:—Messrs. H. A. Ball, F. W. Jordan, A. S. Handford, and A. Ernest Smith. Mr. C. N. Peal and Dr. Gibbon manipulated the lantern.

Eastbourne Photographic Society.—January 29.—The Eastbourne Photographic Society gave an excellent account of itself at the Town Hall on the above date, when it made its initial bow to an appreciative public. The proceedings took the convenient, comprehensive, and pleasurable form of a *conversazione*, which is a friendly *têtes-à-tête*, an exhibition, a demonstration, a feasting, speechifying, and a concert all rolled into one. The President (Dr. H. Habgood) and the Hon. Secretary (Mr. Hollway) had gathered to their support a host of enthusiastic helpers, and the programme to which they addressed themselves was carried out with admirable spirit and completeness. Capacious as the Assembly Hall is, it was none too roomy for the stores of photographic specimens and multiplicity of supplementary exhibits which were displayed for the delectation of visitors. From the point of view of attendance, the result was extremely gratifying, the hall being well filled. A start was made at half-past seven with two or three short speeches from the platform, where the President of the Society (Dr. Habgood) was supported by the Mayor (Alderman Seay), Mr. Michell-Whitley. Mr. Hollway (Hon. Secretary), and others. The MAYOR, alluding to the Society, which was started in 1892, stated that at present there were forty members; but, as the subscription was only 7*s.* 6*d.* a year, the Committee hoped that, as the result of that *soirée*, the number would be materially increased. Microscopes were exhibited on tables running down the room, many of the objects submitted to view being very beautiful. A large collection of rare butterflies was exhibited by Mr. Cox Watkins, who also assisted in other ways, notably in the lending of electrical apparatus, by means of which some very interesting and successful experiments were made in the Mayor's parlour by Mr. T. Ryder. A lantern exhibition of photographs, executed by members of the Society, was an attractive feature of the evening's doings. Mr. W. Sparrow manipulated the lantern, and the pictures, which were chiefly photographs of local men and scenery, were explained, as also the distinctive processes by which they had been taken, by the President of the Society. Those chiefly responsible for the photographs were Dr. Habgood, Mr. Kelsey, Mr. Michell-Whitley, and Mr. Cooper, and their admirable productions were greeted with rounds of hearty applause. Later sets were the work of the Rev. H. G. Jameson, Dr. MacQueen, Dr. Gabbett, Messrs. Plummer, J. R. Thomson, Gibbs, J. J. Rawley, F. Soddy, F. Pennington, and Rust. All the views showed a high standard of proficiency on the part of the amateur artists. At intervals there were excellent musical contributions, and light refreshments were also dispensed.

Hackney Photographic Society.—January 30, Mr. R. Beckett in the chair. —*Apropos* of the fact that several members had failed to obtain sepia tones on matt P.O.P with the sulphocyanide bath, Mr. Roofe showed a warm-toned print produced by immersing the same, previous to toning, in a solution of common salt, then toning for a short time in a sulphocyanide bath with double quantum of gold, as per Mr. Howson's formula. Mr. Barnes showed Edwards's improved film-carriers for use in ordinary dark slides, and also their new double dark slides for plates and films. These possess some very good points in that they are very ingeniously constructed, compact, and well made. The adapter for fitting the slides to the camera reversing back has been well considered, the arrangement of the focussing screen being especially good. Mr. THOMAS BEDDING then read a paper on *The Stereoscope: Past and Present*, and illustrated his description of the various instruments with explanatory diagrams on the blackboard. Passing from the reflecting stereoscope, invented by Wheatstone in 1839, Mr. Bedding described in detail all the principal forms from Sir David Brewster's instrument to those in use at the present day. In his remarks on Brewster's lenticular instrument, the lecturer said that its box form and limited capabilities probably led to the stereoscope's decline in popularity. Although many improvements on the early instruments had been made, yet there was still room for more; Mr. Bedding then mentioned the desirable points which a good stereoscope should possess. It should be capable of use with both prints and transparencies; the lenses should be achromatic, should be fitted with eyeshades, and should each have an independent horizontal movement, so that they might be moved closer together or farther apart; the lens front should have a vertical motion, preferably with rackwork adjustment, which latter should also be used with the print or slide-carrier. Referring to the neat and handy instrument, of which the invention is credited to Dr. Oliver Wendell Holmes, Mr. Bedding said that it possessed one good point—it had a good eyeshade. Otherwise, it was generally made to sell at such a low price that it had become cheap and nasty, and would not tend to make the stereoscope popular. A discussion followed the reading of Mr. Bedding's paper, in the course of which many questions were answered by its author. Mr. W. L. BARKER described his stereoscopic camera, and said that he preferred lenses of short focus, in order that a wider angle of view might be included on the plate. Mr. GOSLING said that he considered stereoscopic photography the most fascinating branch of the art. No one need be deterred by considerations of expense, for he (Mr. Gosling) was in the habit of using a home-made stereoscopic camera, of which the lenses were taken from a common stereoscope, costing 2*s.* 6*d.* This, though cheap, was capable of doing good work. The speaker confirmed this statement by handing round some very good stereoscopic photographs.

Woodford Photographic Society.—February 1, the President (Mr. H. Wilmer) in the chair.—Mr. H. T. Malby showed a shoe for preventing the tripod from slipping on polished or smooth floors, consisting of an indiarubber tube having the end plugged with a piece of hard rubber, inside which was a piece of cork. It was found to grip the end of the tripod very firmly, and to give a secure footing under most trying conditions. The Secretary (Mr. H. W. Bennett) showed Edwards's new dark slide holding two thin plates or two films. The opening in the slide body is so shaped that the shutter can be pushed right home without any risk of catching on the frame, as may frequently happen with thin metal or celluloid shutters. The slide is exceptionally small and thin, and, though thoroughly well made, is very low in price. Negatives were shown by Mr. E. B. Caird and Mr. E. Marriage on Sandell plates—dark interiors with windows, the frames and heading being quite clear and free from halation. The President criticised taking clouds with a lens of different focus from that used for the landscape for which they were intended. The Secretary expressed the opinion that apparent truth was of more importance than actual truth, and that a nearer approximation to the impression produced by the clouds themselves, and a better effect of distance, could be frequently obtained by taking the cloud negative with a shorter-focus lens than the remainder of the picture. The discussion on *Estimating Exposures* was opened by Mr. E. Marriage, who showed a series of negatives from the same subject, varying from one to thirty-two units of exposure. Although the over-exposed had been very successfully developed, yet the inequality of their rendering of the subject was very marked. He preferred to gauge the value of the light by means of a Stanley actinometer, giving an exposure of one-twentieth of its reading for an open landscape, using *f*-16 and an Ilford ordinary plate. He considered estimating the light the greatest difficulty, and modifying the exposure for the subject a much more simple matter. Mr. W. H. Harrison (a visitor) spoke of the difficulty of correctly timing exposures of less than two seconds' duration, saying that a simple mechanical device, that could be set to give half a second, or any time up to two seconds, would be a great boon to out-door photographers. Mr. H. T. Malby, speaking from the experience gained by working under extremely varying conditions, dark interiors, general landscape work, and copying in the studio, strongly advocated the Watkins exposure meter as being a trustworthy guide to an experienced worker and invaluable to a beginner. He said that, by following its instructions with judgment and discretion, he could always ensure his negatives being correctly toned. When taking a series of nearly two hundred for lantern-slide making by its aid, though the conditions were varied and, in

some cases, very trying, all were perfectly correct in their exposure. He found that he could leave it in the hands of pupils with most satisfactory results. The SECRETARY said that it seemed undesirable to train a beginner to depend entirely on a mechanical aid to correct exposure. A meter of this kind could never measure the intensity of the light reflected from the subject, and the distance of any shadow from the camera, the amount of intervening atmosphere, and also the effect desired in the finished picture, would all be factors in determining the exposure. It would be useless to expose the sensitive paper of the meter in a shadow near the camera under the impression that a similar shadow at ten times the distance would produce the same effect on the plate. He considered that any exposure table or other guide for a beginner should be of the most simple kind possible, and designed as a basis on which judgment should be formed rather than as something to take its place. Owing to the lateness of the hour the conclusion of the discussion by the President was deferred until the next meeting. Next meeting, February 15, *Estimating Exposures*, conclusion of the discussion by the President (Mr. H. Wilmer), who will also give a demonstration of *Carbon Printing*.

Bath Photographic Society.—January 31, Mr. Austin J. King (President) in the chair.—Presentations of photographs of interest scientifically were made by B. J. Edwards & Company, London, and Mr. Bligh Bond, Bristol Amateur Photographic Society. Mr. GEORGE F. POWELL then discoursed for an hour on places visited by the Society at the summer excursions, illustrating his remarks with numerous lantern transparencies, many of which had been made by contact from Kodak film negatives only a few hours before the lecture. The Annual General Meeting was announced to take place on February 28. Messrs. Appleby and Howe were appointed auditors.

Birmingham Photographic Society.—An Exhibition took place on the 26th inst. of pictures taken by the members upon the Society's excursions during 1893, Mr. J. P. Mousley having offered a medal for the best representative collection. Mr. Keene, of Derby, acted as Judge, and awarded the medal to Mr. E. Underwood, for an exhibit of twenty pictures, comprising *genre*, landscape, and architectural subjects. Messrs. Greatbach and E. C. Middleton were specially mentioned for certificates of merit. The latter exhibited three pictures of Oxford subjects, which were considered excellent; but, being taken on one excursion only, they were not sufficiently representative of the season's work.

Cardiff Photographic Society.—February 2.—A series of very beautiful slides, illustrating the *Life and Scenery of South Africa* were shown. The whole of the pictures were highly appreciated by a large audience. Professor Scott experimented with his new saturator, the light produced on the screen being of extreme brilliancy. The instrument is of very small dimensions, and can be carried in the coat pocket. It is most simple in construction, no warm-air arrangement being necessary.

Fairfield Camera Club, Liverpool.—Mr. T. E. C. Wilson in the chair.—The rule requiring an entrance fee was abolished, and Mr. A. B. Spence was elected a member. A practical demonstration was then given by Mr. S. H. Fry, the representative of the Paget Company, the subject being the method of rapid printing on the Paget Print-out-Paper. The lecturer developed and toned several partly exposed prints, and exhibited some examples of photographs on the ordinary and matt-surface papers of his company.

Ipswich and Suffolk Photographic Society.—A photographic exhibition of work by the members was opened on Saturday last at the Fine Art Club, Ipswich. Nearly a hundred frames are hung, the principal contributors being Messrs. J. Dixon Piper, President, A. F. Penraven, Hon. Sec., H. Clarke, J. Reynolds, Williamson, Pringle, &c. The Annual General Meeting has been postponed until Tuesday, February 13.

Leeds Photographic Society.—February 1, Lecture by Mr. F. O. Bynoe, of Messrs. R. & J. Beck, of London, on the hand camera, with special reference to the Frena camera introduced by Messrs. Beck. Mr. J. H. Walker (President) occupied the chair.—The lecturer, after alluding to the various principles on which the many hand cameras existing previous to the invention of the Frena were constructed, fully explained the details of the newer instrument, and the advantages claimed for it over all others, with regard to its mechanism and optical excellence, as well as on account of the use of a large number of cut films in place of a few heavy and fragile glass plates. His exposition was illustrated by lantern-slide diagrams and working models of various parts of the camera, and at the close of the lecture a large number of pictures taken with the Frena were projected on the screen. After questions and discussion, a hearty vote of thanks was accorded to the lecturer. A vote of condolence with the widow and family of the late Mr. J. W. Ramsden was also passed. Mr. Ramsden was an hon. member of the Society, and one of its founders in 1852. There was a large attendance at this meeting, and fourteen gentlemen were proposed for election as members of the Society.

Liverpool Amateur Photographic Association.—January 25, the President (Mr. Alfred Tyrer) in the chair.—Nine new members were elected. The medals gained at the recent annual competition were presented at this meeting, also a silver and bronze medal, won in the National Lantern Slide Competition, were handed to Messrs. F. Anyon and Joseph Earp respectively. Mr. JOHN HOWSON gave a practical demonstration of the working of the new matt-surface P.O.P. After going into the need for, and past efforts in this direction, he explained and demonstrated the great advantages of the present paper over the attempts by squeegeeing on ground glass, and the consequent trouble in stripping same. It was claimed and proved by the specimens exhibited in the room that the loss of detail in the shadows, flatness, &c., was far less than any other printing process, hardly excepting the objectionable highly glazed surface. The toning and manipulation is carried out on similar lines to the P.O.P., with extra advantages, of less liability to damage to the surface; and a special feature was the great ease in which the mounting was done under the lines of the old albumenised paper, viz., the prints are placed face down, one on top of the other, in a wet state; first take away the extra moisture with a sponge, then well cover with good starch paste, giving special attention to the edges and corners; after placing into position, press down with dry sponge.

Midland Camera Club.—January 19, Dr. Hall Edwards in the chair.—The Thornton-Pickard focal plane and snapshot shutters were exhibited by the President. A stereoscopic print of "Fakirs" taken at Calcutta was shown by the Hon. Secretary. Mr. FRED ILES gave a demonstration on *Bromide Printing*. The lecturer commenced by giving an account of the first bromide papers introduced, mentioning that the minimum exposure was two minutes and the development taking from twenty-five to sixty minutes, the resulting image being of a red colour, necessitating subsequent toning. With respect to developers, a new era was said to have commenced with the introduction of amidol, which Mr. Iles preferred to any other, as many prints may be developed at the same time, and at a much more rapid rate than with hydroquinone or ferrous oxalate. Several prints were shown, especially micro-photographs, to prove that ample density could be obtained with amidol. The proportions of developer recommended were: ten per cent. solution sodium sulphite, two per cent. solution of amidol; equal parts of each, with three parts of water. Several prints on Criterion enamel paper were developed, and the results were considered excellent. Some splendid examples on this paper, previously squeegeed on to ground glass, were exhibited, the results being considered by many members equal to platinotype. The lecturer pointed out that a squeegee was unnecessary, as the finest results were obtained by just allowing the print to fall on to the glass, without pressing. Alum was not considered essential, as with a soft film a much better surface was obtained. Speaking of fixing and washing, the former was considered the more important, too little time in the fixing bath being generally allowed. One hour's washing in running water was stated to be sufficient. The demonstration was full of useful hints, the lecturer being a finished and skilful operator.

Newcastle-on-Tyne and Northern Counties Photographic Association.—January 23, Mr. J. P. Gibson (President) in the chair.—Mr. J. HEDLEY ROBINSON read a paper on *Stereoscopic Photography*, and illustrated his remarks by an exhibition of apparatus, negatives, and slides.

Edinburgh Photographic Society.—The second popular Meeting of this Society was held in Queen-street Hall on the evening of January 26, and the large hall was crowded. It was of the nature of a lecture by two persons, the pictures being by Mr. James Patrick, and the description, anecdotes, and historical account of them written by his gifted sister, Mrs. Patrick Findlay, and was entitled, *Rambles through Fife with a Camera*. The pictures were the outcome of a number of visits to the various places made by the lecturer during the last summer, and, although many in number and fine in quality, they by no means exhaust the picturesque beauties, or ecclesiastical and historical places, within the ancient kingdom of Fife. When it is mentioned that the rambles excluded the ruins of Dunfermline Abbey, the place of sepulture of a dozen of the kings and queens of Scotland, including the founders, Malcolm Canmore and Robert the Bruce, and St. Andrews, with its university, castle, and magnificent cathedral ruins, the Norman church of Leuchars, one of the oldest in Scotland, and all the Tay shores and villages, it will be seen that there is room for at least one more delightful evening from the same source. The chair was occupied by the PRESIDENT (Dr. Drinkwater), who, opening the proceedings, said all he needed to do this evening was, in the time-honoured way, to introduce their welcome friend, Mr. Patrick, who would require all the time they had at their disposal this evening. The lecturer began his travels with a fine foreshortened view of the great Forth Bridge, with a train entering upon it, St. Margaret's famous anchorage below it, and the Fife hills in the distance. Passing on, he gave episodes in the lives of the two Scotish queens, Margaret the Wise and Mary the *otherwise*, *àpropos* of Rosyth Castle, which was then showing on the screen several views of Inverkeithing, the quaint and sleepy royal burgh near which it is. Inchcolm and Aberdour gave several fine pictures, of which the old keep and richly fringed lock of Otterstone was perhaps the finest. This spot can boast of some of the finest sycamores in Britain. A series from Burntisland and neighbourhood succeeded one near Kinghorn, showing the monument commemorating the death of Alexander III. of Scotland in 1285, caused by accidentally riding over the neighbouring cliffs, the shale, &c., of their formation not then giving the oil and paraffin light now extracted from them, and the night being very dark. Much was made of Kirkcaldy, as might be expected from the lecturer's intimate connexion with the "lang toun," the peculiarities of it and its inhabitants being hit off with a humorous grace as delicate in its way as the pictures themselves were in theirs. The bust of Adam Smith, the father of British political economy, was shown, and one of Thomas Carlyle, taken by Mr. Patrick, sen., with a group of him and Dr. Carlyle, his brother, and the sage's niece, Miss Mary Carlyle Aitken, with their host, Provost Swan. These latter provoked great applause, as did several anecdotes pertaining to Carlyliana. Going eastward along the shore, the various villages gave their quota of views, the most interesting probably those showing the extensive and extended series of caves, which, indeed, with their Pictish title of Weems, give their name to two of these shore villages, East and West Wemyss, as well as to the noble family and imposing castle of Wemyss. Several pictures of the antique, and as yet undeciphered, symbols, circles, cups, and apparently runes, which are carved in their walls and in many places about their areas, were admirably rendered. Buckhaven yielded quite a crop of its auld warld reeling, spinning, and line-baiting wives, picturesque fishermen, boating, fishing, and shore scenes, which allowed the introduction by Miss Snadun of the famous song of "Buy my caller herrin'," which was well rendered and heartily cheered. Methil and Leven, each with its quota of pictures and anecdotes, being passed, we arrive at Largo, famed as the birthplace of Alexander Selcraig (not kirk), the prototype of Defoe's *Robinson Crusoe*, a capital sculptured figure of whom, in his goatskin garments and fire-lock, by the late Burnett, of Edinburgh, was shown. Largo is rich in antiquarian and archæological relics. The standing stones of Lundin, three of which still stand about eighteen feet above the soil, may be fragments of cromlechs, or monuments of ancient warfare, or burial marks of noted chiefs, now forgotten. A picture of part of an antique carved cross, now removed, was shown, as also those of pieces of a silver hoard of treasure trove which have been preserved, and which was discovered in a tumulus called Narries Law, from the name of the pedler who dug for and discovered it, and who for

years used it as his bank, and which lies to the north of Largo House. The ornamentation on the pieces left is of the most primitive kind, and of similar type to those seen in the Wemyss caves. One of the objects is certainly a torque, with twisted neck-ring flattened, and ornamented at the two open ends, which seem made to lie on the breast. This piece is of very elegant formation, and has been repeatedly engraved in antiquarian works. It was most likely a symbol of authority. During the exhibition of the Largo pictures, the song of "I cuist my line in Largo bay" was sung. Elie, with its well-known golf and tennis grounds, Kincraig Point, with a wreck going to pieces in the bay, and Newark Castle, brings us to the most quaint of all the Fife wee toons on the Forth side, St. Monans or Monance, a village which has been the subject of more pictorial illustrations in oil, in water colour, pencil, and photography than all the rest put together, and in the lecturer's hands, in addition to pictures, it evoked several side-spliting humorous anecdotes, which were well received. East and West Anstruther, Cellardyke, and Crail all yielded fine lantern pictures, which brought the audience to the end of the long peninsula of Fife, and to its East Neuk, with storm-beaten shores all round it, and its solitary world's-end-looking cottage, sheltering under a huge chunk of weather-worn rock, as if to prevent it being swept away from that wind-swept point, which seems to catch and to feel every breeze from every point of the North Sea, and brought to a close an exceptionally long and ill-to-beat lantern exhibition. The lecturer was thanked by the Chairman amid applause before the meeting dispersed.

Glasgow Photographic Society.—January 11, Annual Smoking Concert, the President in the chair.—There was a very large turn-out of members and friends, and for over three hours song and sentiment flowed in a constant stream, and, had not "Forbes Mackenzie" knocked at the door, other two hours might have been spent with pleasure and satisfaction. All agreed that it was one of the most successful that had been held.

FEBRUARY 1.—Three new members were admitted. The question-box being opened, one question was found, viz., "What is the difference between an amateur and professional?" All agreed that there could be only one definition, viz., that the one practised the art for pleasure, the other for pleasure and gain combined. Mr. JAMES ANNAN, one of the Vice-Presidents, gave a demonstration on the production of *Photo-litho Transfers*, and explained in detail the negative best suited for the purpose. He next showed how they were inked up and washed, the whole operation being watched with close attention, and which was carried out with complete success. The Chairman then vacated the chair, which was filled by one of the Vice-Presidents (Mr. Lindsay Murray). The PRESIDENT then gave a short demonstration on the new *Platinotype Printing-out Grain Paper*, and showed prints, kindly sent for the purpose by the agents. They were very much admired. The President then produced some prints which he had printed to show the meeting how they were afterwards to be treated. He stated that some of the prints had been more than eight days in the frame. The negative was by no means dense. The instructions were to well dry the paper, as, if so doing, the printing was more rapid. He found that this was not so, as by giving the paper a slight damping the time of printing was reduced to some two days, and yielded, if anything, better results, even over good vigorous negatives. There were some good points about the paper, but, so long as it was so slow, he considered it would not came into general use. As an experiment, one of the prints was cut in two, one half steamed and the other put at once into the clearing bath of acid. On comparing the halves no difference was noticeable. To illustrate the great difference in the time of printing as compared with the cold-bath process, he showed a print made in about fifty-five minutes, and the cold-bath paper fully printed and rich in the blacks. Mr. Platt then showed a print that he had made on the new paper which had three days' exposure; it was only a ghost of a print. The PRESIDENT felt satisfaction that he was not the only one who had failed to get good results. A hearty vote of thanks was then accorded to the President and Vice-President for the interesting demonstration. The PRESIDENT then resumed the chair, and called the attention of the members to a very fine collection of platinotypes, by Mr. Richard Keene, of Derby, which, at his request, had been sent for exhibition to the Society. They were closely examined by the members, two prints, copies of paintings in St. Michael's Church, Derby, were considered as fine copies of paintings as ever had been produced in photography. Mr. Keene in a letter explained how they were taken, the exposure being about two and a half hours. The President was instructed to convey to Mr. Keene their great delight in having the privilege of inspecting such a fine collection. The President then intimated that Mr. Fry would give a paper on *Development of Lantern Slides* at the next regular meeting on the first Thursday in March, and during the month an extra meeting would be held in Messrs. Annan's gallery, when Mr. Maloni would give a demonstration on *A New Magnesium Light for Portraiture* on a day to be afterwards fixed; also that the Council agreed to have a "Salon Night" for the members and friends. If the details can be carried out in their present rooms, it is intended that the members and their friends show their work, as also a select collection of photographic apparatus, also a half hour or so with the lantern for the edification of their lady friends.

Kilmarnock Amateur Photographic Society.—January 19, Mr. Thomas Ferguson (the President) in the chair.—The Secretary (Mr. William Paterson) gave demonstrations on *Enlarging and Carbon Printing*. The enlarging was done on Eastman bromide paper, and the developer was rodinal, in the proportion of half a drachm to two ounces of water. This developer is also suitable for Nikko paper, and no clearing solution is required. The Eastman Company sent specimens of enlargements on bromide and Nikko paper, and Messrs. Elliott & Son speciments of carbon printing, the work of both these firms being much admired. At the next meeting, on Friday, February 16, Messrs. Paxton and Thomson will respectively give demonstrations with platinotype and Alpha papers.

Amateur Photographic Society of Madras.—The following is an extract from the Annual Report:—"There were fifty-two members on the Society's list at the commencement of the year, and twelve new members joined, making the total sixty-four. There were ten resignations during the year, leaving fifty-four members on the list at the close of the year. The usual monthly meetings were held regularly throughout the year. At these there has been great improvement shown, not only in the numbers attending, but also in the interesting and instructive nature of the discussions which have taken place. Papers were read by Mr. Stoney and Surgeon-Major J. L. Van Geyzel and copies of these have been sent to all members. A prominent feature of the year's work is the Exhibition of photographs, which has just been closed. It was the first open Exhibition held by the Society, it being also the first of its kind in this Presidency. Exhibits, numbering over 500 were sent from various parts of the world, the number of exhibitors being fifty. Of these, sixteen were members of the Society, to some of whom a fair proportion of the highest awards in the Exhibition fell. The success of the Exhibition is due chiefly to the exertions of Mr. Dunsterville (who had the very difficult duty of organizing and launching the scheme), and of Messrs. Michie-Smith, Palmer, Walker, and Drs. Dobie and Van Geyzel, who spared neither time nor labour to insure the success of the Show. These gentlemen have abundantly earned the thanks of the Society. The Society is also greatly indebted to H.H. the Maharajah of Vizianagaram, H.H. the Rajah of Ramnad, H.H. the Rajah of Devarakota and H.H. the First Prince of Travancore, who presented medals for competition at the Exhibition. The Committee regrets greatly that Mr. Dunsterville, to whom the Society owes so much, has been compelled to resign the Honorary Secretaryship, but it trusts that the Society will still receive his valuable support in other ways."

FORTHCOMING EXHIBITIONS.

1894.	
February–March.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
,, 9, 10	*Woolwich Photographic Society. Hon. Secretary, W. Dawes, 145, Chestnut-road, Plumstead, S.E.
March 26–28	*Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1909.—"Improvements in Magazine Photographic Cameras." Complete specification. W. J. SPURRIER and G. HOUGHTON.—*Dated February*, 1894.

No. 1955.—"Improvements in the Mode of, and the Means for, Manufacturing the Bellows of Cameras and other such Articles." W. GRIFFITHS.—*Dated February*, 1894.

No. 2036.—"Improvements in the Treatment of Gelatinous Matter and the Production of Photographic Films." Communicated by the Chemische Fabrik auf Actien vorm. E. Schering, Germany. A. ZIMMERMANN.—*Dated February*, 1894.

No. 2214.—"A Machine for Coating Photographic Paper-tracing Paper and Coloured Paper with one Colour only." J. LA-BUA.—*Dated February*, 1894.

No. 2223.—"Improvements in Photographic Cameras." J. WILSON.—*Dated February*, 1894.

No. 2363.—"Improvements in Magazine Cameras." S. D. WILLIAMS.—*Dated February*, 1894.

No. 2383.—"Improvements in or connected with Photographic Developing Dishes." H. STONE.—*Dated February*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN CONNEXION WITH PHOTOGRAPHIC CAMERAS.

No. 21,975. CHARLES SHAW, 104, Aston-road, Birmingham, and JOHN BURN, 41, Sturge-street, Birmingham.—*December* 1, 1893.

THE object of our improvements in connexion with cameras is, first, to so arrange the inside of any photographic camera so that it shall be used for stereoscopic work, and, secondly, to make a superior combination between the dark slide and a changing box.

In carrying out our improvements in a photographic camera, we make the ordinary camera for half-plate work, and so arrange the inside of the camera, that thereby we can take stereoscopic views therein. We divide the open space of the inside of the camera by placing therein an indiarubber sheet right down its centre; this indiarubber sheet is attachable and detachable to the camera, by being fastened at each end to a piece of brass, and also notches are made in the back and front frames of the camera, for each piece of brass to lodge therein, and to hold in position the sheet of indiarubber, dividing the inside of the camera for stereoscopic work, and with its usual two lenses, and also with or without reversing frame for taking pictures vertical or horizontal. We make our dark slide, which fits the back frame of the camera, with its sliding panels, and to carry the two plates, and also to fit and adjust itself with accuracy into the changing box, and having at one end a sliding brass plate therein. We make our changing box such a size and shape that may be required, and to carry a dozen plates more or less; this changing box is closed at all parts except one end, which is fitted with a top, having two apertures, and two sunken brass sliding plates to slide over them. We fill this changing box with as many plates ready for use as may be required. We insert one end of the dark slide into one of the sunken openings on the top of the changing

box, and it locks itself into a brass catch, and both are held together tightly in position, and all light is excluded, for the sunken surface is lined with velvet or other material. We withdraw the brass sliding plate from the dark slide, and likewise from the changing box, and these two, bound together by catches, we invert, and a couple of plates slide from the changing box into the dark slide, and two brass sliding plates are pushed into their former position, and the dark slide is detached from the changing box and placed into the back frame of the camera, and when the picture is taken, the dark slide is again attached to the other sunken opening on the top of the changing box, as before described, and the plates slide from the dark slide into the changing box to wait for further development. The dark slide and the changing box are attached and detached as often as may be required.

We form a brass frame upon the changing box to hold index tablets of contents of the changing box. It is understood we shall adopt any mere modification in carrying out our invention that may be required, and also use any class of material required for trade purposes.

The claims are: 1. To divide the open space of the inside of a camera by an indiarubber sheet or other material, as set forth, illustrated, and described. 2. The changing box and its combination with a dark slide, as set forth, illustrated, and described. 3. The rims to hold together the plates, as set forth, illustrated, and described.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A GOOD EXAMPLE.

To the EDITOR.

SIR,—I believe you strongly advocate Societies giving an evening for the benefit of the Photographers' Benevolent Association. We are, I fancy, the first to do so, and although we were hampered by a very wet evening and very short notice—all being arranged and carried out *within a week*—the result is fairly satisfactory, for, with our tickets at the modest sum of sixpence, I am pleased to say that I have forwarded a cheque to Mr. Snowden Ward for 3*l.* 19*s.*

It is our intention to make this an annual affair. If we are the first to do this, I trust many, if not all, the photographic societies will follow suit; and, if we are not, still I hope they will follow us, for, as "virtue is its own reward," I may mention that we elected two new members on the evening in question and had *four* others proposed.—I am, yours, &c.,

R. T. MURPHY, *Hon. Secretary, Ealing Photographic Society.*

Argyle-road, Ealing, W., February 3, 1894.

BLISTERS.

To the EDITOR.

SIR,—After thirty-five years' work in photography, one should have gained a slight knowledge of his business; this perhaps is an explanation of the fact that, by the use of a good paper, keeping it fairly damp previous to floating, and using all solutions at the weakest point consistent with the obtaining of proper prints, I *never* get blisters. But I could make a splendid crop at any moment by using double brilliant, kept bone-dry, floated in strong bath, dried crisp, and in the final washing, using the water *direct from the main.* Those troubled with blisters are most certainly committing some of these stupidities, the last one most likely.—I am, yours, &c.,

J. D. COOPER,

36, *Clarence-street, Kingston, S.W., January* 27, 1894.

THE PHARMACY ACT AND PHOTOGRAPHIC CHEMICALS.

To the EDITOR.

SIR,—By this post I send you a copy of the *Liverpool Courier*, which you will see a report of an action brought against me by the Pharmaceutical Society for the recovery of a penalty of 5*l.*, incurred by the salt of cyanide of potassium.

You will see from the accompanying copy of a letter, which I received from the Society's solicitors, and which was the first intimation of their interference in the matter, that their method of procedure is not one calculated to enlighten the members of the trade as to their liability in the sale of poisons, as, had I paid the five guineas on demand (as I find another dealer in this city recently did), no one else would have been any the wiser until called upon to pay a like penalty themselves.

As this is a case which concerns the photographic trade generally, I think it advisable to draw your attention to it, in order that it may be brought to the notice of your readers, and thus prevent others incurring the penalty through ignorance of the Act.—I am, yours, &c.,

FRED V. A. LLOYD.

5, *South John-street, Liverpool, February* 3, 1894.

Copy.

"3, East India-avenue, London, E.C., *December* 8, 1893.

"SIR,—By having kept open shop for the retailing, dispensing, or compounding of poison contrary to the provisions of the Pharmacy Act, 1868, you have incurred a penalty of 5*l.*, payable to the Council of the Pharmaceutical Society of Great Britain, and to be applied by them in accordance with the said statute.

"As Solicitors for the said Society, we have been instructed to collect the said penalty, and, unless the amount thereof, together with our charges as at foot, be paid to us by return of post, to issue process for the recovery thereof.

"We may add that if you, not being a duly registered person, continue to offend against the law as embodied in the said statute, you will on each occasion incur a further penalty, and it will be our clients' duty to press for all such penalties until your offence cease.

"Yours obediently,

"Mr. F. Lloyd, "FLUX, SON, & CO., *Solicitors.*

"5, *South John-street, Liverpool.*

"Penalty ...	...	...	£5 0 0
"Charge ...	...	...	0 5 0
			"£5 5 0."

EXPOSING SPOILED PLATES.

To the EDITOR.

SIR,—I enclose for your benefit a print showing you the view from my back yard. It is not a thing of beauty; but, as the negative was taken under somewhat unusual circumstances, I send it as being—to me, at any rate—a bit of a curiosity. Like most amateurs, I occasionally get mixed up when exposing plates, especially when I take three double dark slides out with me for the day. This happened one day last week, and as the only way of finding out which plate was exposed and which was not was by resorting to the developer, I accordingly flooded the plate, and, as a matter of course—it always is so with me—it was the unexposed plate that I had picked out.

Having read somewhere about the possibility of using plates that had been so developed, I thought I would try the experiment with this one. So, after rinsing it under the tap for a minute or two, I replaced it in the dark slide, without any attempt at drying, intending to expose it in the camera next day. However, next day was wet, and it was not till the day after that again I managed to get it exposed. I gave it ten seconds with *f*-16, at one o'clock, the sun shining brightly at the time. When I came to develop it, the developer—pyro soda—turned the plate black at once, and so dense was it all over that I could not see any light at all through it. I left it in the developer for three minutes, and, although by this time I had given up all hopes of ever seeing an image on it, I gave it a slight rinse with water, and then put it in the hypo, when judge of my surprise when an under-developed negative, with all the detail out, though somewhat feeble, presented itself to my gaze. I am sorry now that I did not take a little more care of the plate at first, and keep it free from stray light and stains, and also that I did not keep it a minute or two longer in the developer, in which case I think I could have secured a fairly good negative.—I am, yours, &c.,

21, *Mill-street, Alloa, January* 29, 1894. JOHN CUMMINGS.

MATT-SURFACE EMULSION PAPER.

To the EDITOR.

SIR,—In order to meet Mr. Howson fairly, and to have the subject seen from both points of view, I send you herewith a matt surface print on Obernetter paper *not squeegeed*, which no one will deny is a *matt-surface print*, at least so it has always been called by thousands who admired it, yourself amongst them.

That the paper has a grain, in no way detrimental as to the results, and does, when held at a certain angle to the light, show a slight reflection I do not deny, but this has never in the eyes of any one disqualified the paper as a matt surface one.

Had Mr. Howson used the qualifying language which you used in your remarks, and stated that he considered his paper a step in advance because he had got rid of that grain, no one would have objected, taking into consideration that he was advertising the paper, but what is objectionable is the statement of denying the matt surface entirely to anything but his own article, coupling that statement with the one of the "clogged shadows" of the "simply thinning down" of the emulsion, statements which are singly and conjointly incorrect, while no reply is made to the latter points at all.—I am, yours, &c.,

J. R. GOTZ.

150, *Shaftesbury-avenue, London, February* 3, 1894.

USE FOR GLASS NEGATIVES.

To the EDITOR.

SIR,—Although the time for winter work in photography is fast passing away, still there may be many who, not having much, if any, time for day work, would like something photographic in the evening besides lantern-slide making.

Therefore I address myself, firstly, to those who have many glass negatives, taking up much room, and always liable to breakage in

moving them about. Furthermore, the cost of xylonite or celluloid films for those who want compactness alone is somewhat of a consideration, costing, as they do, nearly double those of films on glass.

To begin with the case of old varnished negatives, the first thing is to remove the varnish, which can be easily done, and entirely with safety, in two minutes. After drying, the negative is ready for a coating of gelatine, and then, when again dry, for stripping with a stripping solution, the latter not occupying five minutes. It is then laid on a vulcanite or xylonite sheet to dry finally, to be peeled off without any difficulty (when thoroughly dry, but not before), forming a convenient film for packing away, and having the advantage for future printing of being able to be printed equally well from either side.

I have treated as above over fifty negatives successfully.—I am, yours, &c. W. T. F. M. Ingall.

Greenhithe, Kent, February 5, 1894.

PHOTOGRAPHY IN ITALY.

To the Editor.

Sir,—In answer to the query of "M.R.A.," in your issue of the 26th ultimo, there is a customs duty on dry plates and films on entry into Italy; but it is small, about five lire per gross of whole-plates; as it is levied by weight, films come much cheaper. As far as my experience goes, it is easier to pass them at Chiasso than at Ventimiglia.

At Venice, permission will be necessary to photograph in St. Mark's, but a tip to the sacristan in the other churches will obviate difficulties. Dark rooms are to be hired, and materials had, including the plates of Capelli, of Milan, in English sizes, at a shop in the Merceria, near the Piazza San Marco.

At Florence, you may photograph freely in all the churches, but permission is required for the Government collections in the Bargello and elsewhere. Dealers—Sbisi, in Piazza Signoria, and a shop in Via del Sole.

At Rome, in order to photograph the monuments and excavations, a permesso must be obtained from the Minister of Public Instruction, through the Consul. There will be no difficulty about this if your correspondent is provided with a passport. To photograph among the Vatican collections a permesso will also be required, application to be made through the Consul, but it is not so easy to be got.

The various churches of interest to the photographer mostly belong to various religious communities, from the superiors of each the requisite permission will, as a rule, be easily obtained. The chief photographic dealer's shop in Rome is L'Iride, in the Corso 222. This house possesses a small dark room.

"M.R.A." *must* have a passport, and the quickest way of getting a knowledge of photographic Italian will be for him to study the catalogue of one of the photographic dealers here.

A Hurter & Driffield actinograph for latitude 40° will save its cost ten times over during this trip.—I am, yours, &c., W. B. Ferguson.

Pension Michel, 72, Via Sistina, Roma, Italy, February 2, 1894.

"THE NEW ENGLISH."

To the Editor.

Sir,—If I understand him rightly, "Photographer" seems to have "fallen into the curious error" of taking my letter seriously.

It is true that *graphè* was originally used to indicate the action of writing, and *gramma* the result of that action, but both came to be used of paintings and engravings indifferently.

The objection to the word "photographer" is, that it is a mongrel word, composed of the Greek *photograph*, and the Indo-European suffix, "er." Of course, the objection is a purely theoretical one, but people whose mania for a bastard consistency is strong enough to make them write and say "photogram" in place of "photograph" ought not to stop half way.

It is an excellent thing for us that the growth of our language has not been checked and stunted by any "Dictionary of the Academy." In France, its effect on the French language has been precisely the same as that produced on a Chinese lady's foot by swathes and bandages.

Your contributor, "Free Lance," sums up excellently the case against any change of a word in such general use as "photograph" is, but I am a little surprised that so accurate and well-informed a writer should commit himself to the statement that the use of an adjective as a noun is contrary to all English usage. If "Free Lance" will open the Bible, or one of Bulwer Lytton's novels at hap hazard, he will find plenty of examples of such a use.—I am, yours, &c., Leonard Crossle.

54, *Loftus-road, W., February 5*, 1894.

P.O.P. TROUBLES: A FORMULA WANTED.

To the Editor.

Sir,—I should be much obliged if your corresppondent "C. C." would kindly give the formula for the combined toning and fixing bath, which he has found to work well with the Ilford paper.—I am, yours, &c.

Cheltenham, February 6, 1894. Clifford E. F. Nash.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange Watson's No. 2 portrait lens (good for cabinets in short studies) for whole-plate rectilinear.—Address, F. Whaley, Doncaster.

Exchange modern bacteriological microscope, cost 22*l.*, for good 12×10 outfit.—Address, J. Barnes, 149, Manchester-road, Accrington.

Exchange oval embossing press for *cartes* and cabinets, for head-rest for sitting and standing figures.—Address, J. W. Copley, 162 Carr-road, Sheffield.

I will exchange a cabinet hot-rolling press by Solomon, cost 2*l.* 10*s.*, for 12×10 printing frames.—Address, L. Eastment, Photographer, Ebbw Vale, Mon.

Wanted, in exchange for lithographic press, fourteen inches, by Barrett, a Ross's or Dallmeyer's whole-plate wide-angle lens.—Address, A. W. Tear, 12, Clapham-road, S.W.

Wanted to exchange cabinet burnisher in good condition for 12×10 half-plate and whole-plate printing frames.—Address, W. J. Basher, 79 Killigrew-street, Falmouth.

Will exchange first-class scenic backgrounds and accessories for best graduated backgrounds and good accessories or studio camera stand.—Address, A. J. Bond, 85, Fore-street, Bodmin.

Exchange an exterior background in flatted oil by Marion of London—size, 8 ft. by 7 ft.—for an interior landscape or seascape.—Address, W. Jones, 272 Uxbridge-street, Burton-on-Trent.

Will exchange very good half-plate portrait lens for 9×7 rapid rectilinear, or 9×7 wide-angle symmetrical, iris diaphragm preferred.—Address, T. Blackman, Exchange-street, Peterborough.

Exchange gate and wall, boat, oar, and waterpiece, or two 8×6 backgrounds, canvas, flatted oils, all new, for good violin.—Address, W. Hane, Windsor Studio, Sutton, Surrey.

I will exchange whole-plate Rouch portable camera and six Tylar's metal double dark slides for modern half-plate camera and three double slides.—Address, G. Wilson, photographer, Grange-over-Sands.

Seven hundred British Journals of Photography and *Photographic News* dating back to 1874 in exchange for a Max Levy half-tone screen plate, size 8×5 inches.—Address, J. H. Ainley, 426, London-road, Lowfields, Sheffield.

Exchange an Optimus magic lantern, full size, with forty slides, some coloured, carrier, and a box of varnish colours for slide painting, all for 10×8 rapid rectilinear lens or whole-plate camera and slide.—Address, G. Moore, Buckfastleigh.

Exchange five years of The British Journal of Photography, unbound, 1889 to 1893, clean, for a burnisher, 6½ in. silver steel bed, automatic, with spirit lamp, perfect as new, or retouching desk.—Address, G. H. Lawrence, Hayes Bridge, Cardiff.

Will exchange porcelain print-washer, 16 in. diameter and 5 in. deep, and The British Journal of Photography 1890-91-92-93, for background exterior, difference adjusted.—Address, C. J. Allard, 2 Werter-road, Putney, London, S.W.

Will exchange solid carved piece of studio furniture, forming a writing-table, American organ, mantelpiece, and fireplace, in good condition, for two exterior backgrounds or portable whole-plate camera and slides. Photographs exchanged.—Address, Owen Brooks, 83, Dewsbury-road, Leeds.

Exchange a 15×12 Scotia, long-extension camera, reversing back, with all movements, and three double book-form dark slides, for twelve-inch square or 12×10 reversing back studio camera, with double swing back and double book-form dark slide, in good condition.—Address, The London and Coventry Photographic Company, Jesson and Norton-street, Coventry.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from 4 to 6, or Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

Photographs Registered:

Jesse Landon, Watford.—*Photograph of two slabs of slate forming fireplace.*

Adolph Lipschetz, Strangeways, Manchester.—*Portrait of Rev. Rabbi Jacob Ryness.*

Clarke & Co., Maidstone.—*Photograph of a group of Amateur Performers in "Cinderella" Pantomine.*

F. F. Weeks, Spots, Sulphurton, Athenæum, Slides, A. E. Hozles, Enamel, and others, in our next.

S. LANCASTER, W. BROWN.—Received; thanks.

JAMES S. HENDERSON.—Thanks, but we have not any occasion to avail ourselves of your kind offer.

E. R. SHIPTON.—The volume can be consulted in the library of the Patent Office, Southampton-buildings, W.C.

A. J. CORRIE.—Possibly the use of rollable celluloid, or thin-cut celluloid films (such as Fitch makes) would answer your purpose.

DON PEDRO.—Not if the alum be thoroughly washed away before the subsequent operation. But we can see no advantage to be obtained by its use.

F. E. G.—No such work is published. Rub the surface of the bromide print over with an ink eraser; that will, doubtless, bring about the condition you desire.

D. and W. PROPHET.—So far as we are aware, reducin is not yet an article of commerce in this country. It may possibly, however, be obtained in Germany.

J. W. C.—No work is published devoted entirely to studio-building. Plenty of information on the subject is, however, to be found in back volumes and in the ALMANACS.

B. J. S.—Colours specially prepared for painting lantern slides are supplied by artists colourmen. Barnards, and we think Lecherter Barbe & Co. make a speciality of them.

OPERATOR.—Possibly the best book on posing is Bigelow's *Album of Posing and Lighting*. It is, or was, published in America, and is now out of print. A copy might be obtained by advertising.

E. R. G.—Husnik's book (in German), Wilkinson's book, and Burton's *Photographic Printing Processes*, go pretty deeply into the process.

T. S. says: "I want to make lantern slides by the carbon process. Is there any work published giving full details of the process?"—The manual published by the Autotype Company gives the desired information.

R. T.—What you require was fully treated upon in an article last week. A flashlight will answer. Use a short-focus portrait lens. One of the "baby type" will, perhaps, prove the most suitable, as the room is so short.

L. W. JELF-PETIT.—We should say that, as the lady did not order the larger pictures, she can very well afford to ignore the photographer's demands for payment. On your statement of the case it appears a very curious way of doing business.

TIME SHUTTER.—This correspondent writes to say that there are not, at present, on the market, shutters giving exposures of fractions of a second. He is evidently unaware that Messrs. Newman & Guardia, and other makers, supply such shutters.

CLAIMS.—If you bought the business, we presume the negatives were included in the purchase. Hence we should say you are quite right in refusing to part with them. If the matter is of any moment, however, you would do well to take legal advice.

MESSRS. DUFF & CO. write: "We should esteem it a favour if you could inform us who are the proprietors of Stirn's Detective Camera?"—We do not know who are the proprietors of the camera, but Messrs. J. Robinson & Sons, 172, Regent-street, supply it.

C. S. A.—Carbon prints on rough paper can be mounted with starch paste; indeed, that is the most convenient mountant to employ. The purity of the mount and mountant is not of the same importance with carbon pictures as it is with silver prints or enlargements.

E. W. A. S. asks: "Could you tell me what the working hours are in a photographic business—not a portrait business—only photo-publishing, such as slides and prints of ornament?"—In reply: We suppose the working hours average between eight and twelve hours, as occasion and requirement may dictate.

WM. GOODMAN.—As the composition you have made is too soft, it may be made harder in future by using less water. It will, perhaps, be more economical, in the end, to purchase the composition of those who supply it. The right kind will then be ensured. No definite formula can be given, inasmuch as gelatine is not a definite compound.

E. GUNN.—The proportions of salt and nitric acid are not very material so long as the latter is not strong enough to act on the gelatine. To an ounce of nitric acid add, say, as much common salt as it will dissolve, and then dilute the mixture with about ten to fifteen times its volume of water. Such a solution "clears," not "reduces," the image. Immerse the plate in the solution, which is only intended for use when it is discovered that the dry plate is veiled.

VICTORIA CO.—As we understand your letter, you have clearly infringed another's copyright. It is not necessary that the picture should bear the word "copyright," and any one making a copy of it does it at his own risk. The only way to ascertain if the copyright is registered is by searching the file at Stationers' Hall. This, of course, is not a thing we undertake. The copy of the letter enclosed shows that the owner of the copyright only requires what is reasonable, and what appears to be his right.

NEW STUDIO (Edinburgh).—The proposed height is not too low to enable good pictures to be taken, but it would be preferable to have it a little higher. Anyhow, raise the height to the gutter to seven feet. The neighbours will, doubtless, not object to that. We should not advise you to abandon the site, if otherwise suitable, on account of the height to which you are limited.

E. C. I. writes: "Would you kindly tell me how and when 'Encaustic Paste,' (p. 895 of ALMANAC) is used. For prints—what prints—with or without burnisher? Can find no instructions regarding it in any hand-book."—A little of the paste is rubbed over the print when it is otherwise finished and then polished off with a piece of fine soft flannel or linen. In fact, use just the same as waxing the glass when the film has to be stripped.

A. MOSS.—The new lenses are, as you say, very expensive, and there is not much prospect of cheap imitations of them being put into the market, inasmuch as all the different forms of them are protected by patents. We cannot enter into any discussion as to the "exorbitant prices" charged by some makers for their goods. Every manufacturer has the right to charge what prices he likes for what he supplies, whether "exorbitant" or not.

ONE WHO WANTS TO GET AWAY FROM THIS QUARTER OF THE GLOBE writes as follows: "Can you give me any information in your valuable *Journal* which is the best seaside place where I can pitch up for ferrotype work so that I may be on the look-out for a shop where I could carry on business in general, also if I shall require a licence or an order and where I shall have to apply for it?"—Unfortunately we know of no such place ourselves. Perhaps some reader can assist our correspondent.

S. W. asks: "Could you give me any information respecting wood-block photography by the carbon process? Have the Autotype Company published it; and, if so, in what paper?"—So far as we know, the Company have published nothing specially on this application of the carbon process. But what is said in their manual on the process generally is equally applicable to wood blocks. But it is advisable to employ a tissue that contains a large amount of pigment in proportion to gelatine. Possibly they have a tissue specially suited for the work. If not, they will most likely make it to your order.

T. MCCREE writes: "Would you kindly say in your next issue: 1. What would be the best and most useful lens for short studio, eleven feet square, to work ½ and ¼ plates? 2. Also, is it possible to make as good stereoscopic photographs from quarter-plate negatives as with proper stereoscopic outfit?"—In reply: 1. If for portraiture, a half-plate and a quarter-plate portrait lens. But with either it will not be possible to obtain good perspective in so short a studio, if anything more than small busts be attempted. 2. Yes; provided the two negatives are taken the right distance apart. The inconvenience of working with two separate exposures is that of obtaining the same exposure and density in each negative.

R. H. MERCER writes as follows: "If you could enlighten me on the following subject, I should be much obliged. I have tried the toning bath for platinotype prints recommended in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, on page 700, and I find that the prints stain—not tone; and, as to a warm tone, I cannot get beyond a dirty yellow. I have mixed two solutions, different ways: the first did not tone at all, no precipitate being formed; the second toned a little, but of a very nasty colour. I may have put in too much acid, would that cause the deficiency? I should very much like to work it properly, as I know of no satisfactory sepia paper on the market. Thanking you for any help you may give me."—Some other correspondents have written detailing similar troubles. Perhaps the author of the article, Mr. J. S. Teape, will be kind enough to reply.

M. AUTY writes: "If it is not asking too much, I would like your opinion on a copyright question. Some time ago I gave a certain publisher permission to reproduce some of my photographs. I find that another firm of publishers are selling a book with some of my photographs in. I have written for explanations, and they say that they have paid all costs for printing and reproducing to the firm I gave permission to. My giving permission to one firm cannot be used by another. I may mention that the book in question has not the name of the publisher whom I gave the permission to. I shall be obliged if you will give me your opinion."—It seems to us that in giving permission to one publisher to reproduce the pictures for one purpose does not entitle him to dispose of it to a third party for another. Much may, however, depend upon what terms the original permission was granted. We should like to hear the opinions of some of our readers on this point.

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THE BRITISH

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DAGUERREOTYPES: THEIR RESTORATION AND PRESERVATION.

From circumstances that are continually coming under our notice, it is manifest that the character of the image of Daguerreotype pictures is still but very imperfectly understood by the majority of modern photographers, although they are often, as a matter of business, called upon to deal with them. Hence a picture, highly prized by its owner, often becomes irretrievably ruined. For example, not long ago a Daguerreotype was taken out of its case, and sent to us, with a query as to restoration, by post, simply wrapped in paper, with the result that it arrived scratched all over, and completely spoilt. Since then we were shown a Daguerreotype that had retained its pristine beauty up to the time it was copied, less than a year ago, that has now become so bad that scarce an image is visible. Again, we have known of pictures being seriously injured by removing dust from their surfaces prior to their being copied. In each instance the injury could hardly be charged to actual carelessness; it was simply want of knowledge of the nature of the picture on the part of those to whom they were entrusted.

The Daguerreotype image is, without doubt, one of the most stable of all silver photographs; but, at the same time, it is the one that is most easily injured mechanically. The image is quite superficial, and can be wiped off with a mere touch of the finger. It does not fade in the sense that silver prints do, but, if it be exposed to the air, it will in time become quite obliterated. The obliteration is caused simply by the tarnishing of the plate, precisely as silver and plated articles become tarnished by exposure to the atmosphere. This can, however, be cleaned off, when the picture will be as good as when it was first taken. The tarnish can, of course, be cleaned off mechanically; but by this treatment the image, being as we have just remarked only superficial, would be cleaned off as well, as some inexperienced photographers have discovered to their cost. It may, however, be removed by chemical means—cyanide of potassium. Some little knowledge is, however, required to do the work successfully without injuring the picture.

Daguerreotypes nowadays are not very plentiful, so that the novice has little opportunity for making his first essay on a few valueless ones. Therefore, supposing that the work cannot be given to one familiar with the working of the old process—the most advisable course with a valuable picture—we shall now describe in detail the method of procedure which, if carefully followed, will end in success.

When the picture is taken out of its case or frame, the paper on the back and edges which secured it to the mount should be carefully scraped off, otherwise pieces of it may float off in the after-operations on to the front and abrade the image. The surface of a tarnished Daguerreotype is usually more or less repellent to water; consequently, if the solution of cyanide of potassium be applied direct, it might act irregularly. Hence the plate should first be flooded with alcohol. As only a small quantity will be necessary, pure spirit should be used, but if methylated be employed it should be that free from mineral naphtha. As soon as the spirit flows evenly over the surface, the plate is rinsed with water till that also flows evenly. It is then ready for the cyanide of potassium. The solution may be used as a bath, or it may be simply flowed over the surface. The latter is the method we prefer, though a novice will perhaps get on better with the bath. As to the strength of the solution, that is not very important, though it must not be too strong. The stronger it is, the quicker will be its effect. With the ordinary commercial cyanide, about ten grains to the ounce of water is a good proportion. With a better quality, half that quantity will be sufficient. In a very little time after the solution is applied the tarnish will disappear, and as soon as it does the plate must be well washed, back and front, with a gentle stream of water from the tap.

Our picture is now quite "restored," but we here come to a very important part of the work, so far as the ultimate appearance of the image is concerned, namely, drying it. If the plate were allowed, at this stage, to dry spontaneously, the finished picture would be considerably marred in its brilliancy from impurities in the water, as well as lines or drying marks. Here is how this trouble is avoided. After the picture has been thoroughly washed under the tap, it is held at one corner, by a pair of pliers, in a slanting position. A lighted spirit lamp being at hand, the plate is flowed over, back and front, once or twice with distilled water and drained from the bottom corner. From this time the inclination of the plate must not be altered. After draining for a short time, the top corner is held a little above the flame of the lamp, and, as the water evaporates, the plate is brought slowly over the flame, but it must not be made hot. The object is to dry the surface evenly from the top downward. If the plate dries unevenly, circular markings will be produced. If the work has been successfully performed, the picture will now be as good as it was when first produced.

Judging by the way that Daguerreotypes are frequently returned to their cases, modern photographers have no conception of the influence that the atmosphere has upon the picture. Daguerreotypists, in the olden times, used to be most particular about securing the metal plate to the mat and glass

by binding them together with paper, or goldbeater's skin, so as to make it air-tight. They were also very careful that no moisture was imprisoned between the picture and the glass. These precautions should also be strictly observed after the picture has been restored, for, if a Daguerreotype be thoroughly sealed from the atmosphere, it will not become deteriorated in the slightest degree with age. There is no occasion to describe how the binding should be done; all that is necessary is to ensure that the picture is made absolutely air-tight, and that the binding will not eventually peel off, as gum paper is at times liable to do.

THE WET-COLLODION PROCESS.

X.—Ascertaining the Strength of Silver Solutions.

It is often of the greatest importance that the strength of silver solutions, *e.g.*, that of the negative bath, be accurately known.

The hydrometer, graduated to suit silver solutions, in which condition it is known as an "argentometer," forms undoubtedly the simplest means of testing the strength of a silver bath. Its indications can always be relied upon to a grain per ounce of solution. Hence, in making up a new bath, the services of a pair of scales need not be had recourse to at all if the photographer elects to do without them. Placed in distilled water the hydrometer stands at the zero point near to its upper end, and gradually rises as crystals of silver nitrate are added and become dissolved.

We have said that its indications may be relied upon, but this must be held as applying with absolute accuracy only to a solution composed of nothing but water and the silver salt; and by absolute accuracy we here mean, as just stated, a grain to the ounce, which for ordinary photographic operations is quite near enough.

The argentometer was first introduced in New York by Mr. Wm. Ross, who, under the name of the Actino-hydrometer, applied it, not only for ascertaining the strength of an aqueous solution of silver nitrate, but for the other solutions at that time made use of in photography, such as sodium, barium and ammonium chlorides, potassium iodide, bromide and cyanide, ferrous sulphate, soda hypo, citric and tartaric acids, together with the percentage of other acids, such as nitric, sulphuric, hydrochloric, and acetic. With it was issued a table, by which, on noting the number on the scale of degrees inside the tube of the instrument, which stood on a level with the surface of the liquid in which it was immersed, the strength of the latter could, by referring to the table, be ascertained without any calculation being necessary. As the silver bath was the solution of which the strength was most frequently wanted to be known, the great majority of these actino-hydrometers were subsequently graduated for this special requirement. Hydrometers are made in two classes, one for solutions heavier than distilled water, the other being for fluids that are lighter, such as ether, alcohol, or ammonia.

But accuracy by the argentometer test cannot be attained after the solution has been in use for any length of time, and when the solution has imbibed products of that decomposition which takes place with the dipping of each plate, causing abstraction both of water and silver, their substitution by the nitrates of potassium, ammonium, or other bases of haloid salts, not to speak of the alcohol and ether, which necessarily fined their way into the solution. We do not mean to say that what may be considered a moderately fair idea of th strength of the bath cannot be had for a considerable tim after mixing a new one, but only that, in order to ascertain with accuracy, another system must be adopted.

Volumetric or quantitative analysis is the one perfect metho by which to know the proportion of silver present in a solutio containing other ingredients. It consists in an application o the well-known fact in chemistry that certain substances i solution precipitate others according to fixed definite law To apply this to the case in hand. Chloride of sodium react upon nitrate of silver, forming a precipitate of chloride o silver which is not soluble in the liquid in which it is precipi tated. On looking up the table of combining equivalents give in The British Journal Photographic Almanac, it will b seen that the combining number of silver nitrate is 170, that o sodium chloride (common salt) is 58·5, which means that a solution of the latter, containing 58½ grains, will, if added t one containing 170 grains of silver nitrate, precipitate th whole of the silver (as chloride), and neither more nor less This, it may be observed, represents 108 grains of metallic silver, with which, however, we have nothing to do in the present computation.

For the practical application of these facts in the testing of a silver bath, no simpler directions can be found than those given in Hardwich's *Manual of Photographic Chemistry*, in which it is recommended to take the pure crystallised chloride of sodium, and either dry it strongly or fuse it at a moderate heat, in order to drive off any water which may be retained between the interstices of the crystals, and then dissolve in distilled water in the proportion of eight and a half grains to six fluid ounces. In this way, a standard solution of salt is formed, each drachm of which, containing slightly more than one-sixth of salt, will precipitate exactly half a grain of nitrate of silver.

To use it, measure out exactly one drachm of the bath in a minim measure, and place it in a two-ounce stoppered phial, taking care to rinse out the measure with a drachm of distilled water, which is to be added to the former; then pour in the salt solution in the proportion of a drachm for every four grains of nitrate known to be present in an ounce of the bath which is to be tested; shake the contents of the bottle briskly until the white curds are perfectly separated and the supernatant liquid is clear and colourless; then add fresh portions of the standard solution by thirty minims at a time, with constant shaking. When the last addition causes no milkiness, read off the total number of drachms employed, the last half-drachm being subtracted, and multiply that number by four, which gives the weight in grains of the nitrate of silver present in an ounce of the bath.

About a quarter of a century ago a simplification of the volumetric system was suggested by Mr. W. H. Wilson, of Liverpool. His requirement was that the number of drops or minims of a solution of chloride of sodium, which it took to precipitate the silver in a given quantity of nitrate solution should represent the number of grains of nitrate of silver to the ounce in that solution. The first thing was to fix upon a convenient quantity of solution to be tested, and a hundred drops were determined upon. By a simple calculation it was found that the solution of chloride of sodium must be thirty-four and a half grains to the ounce. It is thus stated:—As 170 : 130 :: 58·5 : 34·4; or, as the equivalent of nitrate of silver is to the number of drops to be tested, so is the equivalent of chloride of sodium to the number of grains to the ounce in the

t solution. The apparatus required is a test tube and a pette, or dropping tube. Measure into the test tube with e pipette 100 drops of the solution to be tested; rinse out e pipette, fill it with chloride of soda solution, and then drop efully into the silver solution, counting the drops until it is n that no more precipitate is caused. The number of drops ed, less one or two, which may be deducted, will represent the mber of grains of nitrate of silver in each ounce of solution.

We once possessed a nitrate bath for sensitising paper, to ich, for experimental purposes, we had added three or four ndred per cent. of nitrate of soda. Reading by the hydrometer, it was shown to be of enormous strength, something like 0 grains to the ounce; but, when tested volumetrically, its l strength was found to be a little under thirty grains per nce.

Much might be written concerning applications of the principle of volumetric analysis to the estimation of the strength silver solutions, but we shall conclude this chapter by giving rief account of the system, worked out and applied by Dr. gel, employing for greater accuracy the metric terms in ich it was published. Ten grammes of iodide of potassium dissolved in 1203·4 cc. of water. (One hundred cubic timetres of this precipitate exactly one gramme of nitrate silver). This is poured into a graduated burette tube furhed with a spring tap at bottom, and supported on a stand the usual way. Enough of the solution is first run off by tap to bring the surface of the fluid to the zero point of scale. A solution of persulphate of iron of strength imterial, and also a solution of starch, are provided. To make test, place exactly one cubic centimetre of the silver in a ss vessel, and add thereto a little of the iron and a few (velve or fourteen) drops of the starch solution. Now add iodide drop by drop, shaking the vessel slightly so as to move the blue colour, should such appear. At last a point reached at which the blue colour remains permanent, viz., it es not disappear on agitation. Now close the tap and read position of the fluid in the burette. If, for example, it nds at $7\frac{3}{5}$, then the silver solution employed contains $7\frac{3}{5}$ per t., that is $7_{\frac{3}{5}}$ grammes of silver in every 100 cubic centitres. This is stated to give extremely accurate results, and be easily read off, owing to the colouration of the fluid.

Vatican Cloud Photographs.—In the recently issued ort of the Vatican Observatory will be found, in an article on teorology, a series of excellent cloud photographs, with remarks on their appearance as bearing upon weather-forecasting. Four the series are published in the current number of *Nature*, and m perhaps the best cloud studies yet accompanying any Society's nted report.

Living Photographs.—The same journal gives a print from rue living photograph to illustrate a paper on the *Action of Light Bacteria*, read at a recent meeting of the Royal Society. A prered gelatinous film, impregnated with spores or bacteria, is spread er the bottom of a shallow glass dish, and an image of the spectrum own upon it, the rest of the film being covered by tinfoil. When film has been exposed to the action of this spectrum light for ne hours, it is put in the "incubator." The unexposed part beves as usual—the spores germinate, and the film becomes opaque. cording to the germicide action of light the exposed parts have re or less of the organisms killed, the plate remains more or less nsparent, and a living negative is the result. Briefly, we may say, is found that the action begins at the blue end of the green, rises a maximum as we pass to the violet end of the blue, and diminishes as we proceed in the violet to the ultra-violet regions. In the supra-red, red, orange, or yellow region there is no action—the light has killed all the spores or germs.

A Living Transparency.—At the opposite end of the scale of organic beings we may record the latest departure in this direction. Professor Freidenwall, at the College of Physicians and Surgeons, Baltimore, recently illuminated the interior of a living man, and two hundred persons were able to watch the workings of the patient's internal organs, who thus became an actual "living transparency." The lighting was produced by passing, by means of a flexible tube, a small electric lamp into the stomach of the patient!

A Photographers' Co-operative Union.—It will be seen by reference to the report of the meeting of the National Association of Professional Photographers, which was held at Birmingham last week, that that Association has decided to form a Co-operative Union for the purpose of supplying members and others with photographic material and apparatus. It would be premature to discuss the scheme in the absence of a detailed prospectus; but, if it is at all calculated to benefit professional photographers as a body, we wish it every success. Looking at the fact, however, that at the present moment so many photographic dealers find a difficulty in making both ends meet, we are rather curious to know how the Co-operative Union, which will assuredly entail considerable expenses of management, will fare in its enterprise.

Assistants and their Specimens.—Assistants and others answering advertisements frequently write to us to complain of the non-return of specimens sent, and invariably condemn the advertiser for his carelessness or culpability in neglecting to return them. We fancy, however, that the blame for this state of things is sometimes not rightly located. Quite recently, when in the *atelier* of a professional photographer who had been advertising for an operator, he informed us that he had received nearly three hundred applications, many dozens of specimens being forwarded to him without any discoverable indication from whom they came. Our friend said he would have been very glad to get rid of the specimens. The moral is that, before disappointed assistants start scolding photographers for detaining specimens, they should be tolerably sure that they themselves are innocent of carelessness in transmitting them.

New Hot Water Filter.—The filtration of solutions of gelatine or other liquids viscid at ordinary temperatures is always a matter of difficulty, and the apparatus manufactured for facilitating the operation generally being expensive, hence a new simple contrivance for effecting the required end will be well received. Such an apparatus, the invention of Mr. C. R. Beck, of Cheltenham College, is described in last week's *Chemical News*. It consists of an outer glass funnel with the tube part cut off close. The aperture is then fitted with a perforated bung, and into the perforation a second funnel to contain the liquid to be filtered is fitted, the first forming a jacket for the second. The interspace contains water, which is kept hot by blowing steam into it, the steam tube reaching the bottom of the water, and the excess of water thus formed is carried away by a constant level syphon, or a strip of wet tape hanging over the edge answers the same purpose. The apparatus is thus inexpensive and not liable to danger from the naked flame playing against the jacketing.

Photographs of a Flying Man.—The dream of a flying machine is ever in the minds of some ardent votaries of the science of aërostation, and a preliminary machine has been constructed, and put into use, and the results photographed. Herr M. Lillienthal, a German *savant*, holds the view that the experimenter should first learn to soar in the air, and his machine is devised so that, by taking a smart run, and jumping from an elevation, he may gradually pro-

gress, and gently fall to the ground. In describing these experiments, it has hitherto been customary to take the published accounts *cum grano salis;* but in Herr Lillienthal's case there is no deception, for in a recent number of *La Nature* will be found three photographs of him, taken from three different standpoints. He travelled several hundred feet in the air, and the photographs distinctly represent him in various attitudes in the air, the landscape below him, with spectators being included. The effect is most remarkable, and incontestable evidence is afforded at once of the progress he has made, and of the immense value of photography in conclusively proving the accomplishment of aërial flight.

"Nature" upon Scientific Photographs.—In the Annual Report of the State of New Jersey appear, among other illustrations, in a paper on a geological subject, some prints from photographs. The Editor of *Nature*, who evidently has no sympathy with "impressionist photographs," says: "The professional photographer complains of the hypercritical eye of his fair sex constituency; one would wish that Nature had a word to say for herself. The photographic camera is fast coming to be considered part of the equipment of the geologist. If men whose movements in the field are already well burdened by hammer, compass, knapsack, and specimens, are willing to add to those the inconvenience of a camera, there must be great advantage to be got from photography. But what advantage will be derived from an occasional lucky hit? It would be difficult to name the science now that does not utilise photography. Clearly the time has come when another 'optional' may be added to the subjects of the complete curriculum. At any rate, science must recognise photography at its professional value, and must refuse bad photographs and worse prints." This has reference to his criticisms on Mr. Clark's photographs printed in the report, of which he says: "Some of these . . . . suggest nothing so much as an ultra-impressionist daub, all blur and no colour."

THE COMPARATIVE RAPIDITY OF MODERN GELATINE PLATES.

We frequently hear the question discussed as to the comparative rapidity of the most rapid gelatine plates of the present day and those of a decade or more ago, and there seems to be a prevalent idea that the advantage is very greatly in favour of the former. Looking as far back, however, as fifteen years ago, although I am bound to acknowledge that the general run of plates at the present time is actually far in advance of the great bulk of the plates of that period, I doubt very much whether, comparing the very quickest plates of then and now, the latter can claim much superiority in the matter of sensitiveness.

No doubt, if we take into consideration also the question of quality, then, with the most exalted sensitiveness, the plates of to-day must be acknowledged to be far away ahead of those produced in the earliest days of gelatine-emulsion photography, a circumstance that is but the natural outcome of the experience devoted to their preparation on a large commercial scale and the extreme care lavished upon every step in the process. But so far as the actual principles involved in attainment of sensitiveness are concerned, we cannot be said to have learnt a great deal since Mr. Charles Bennett first divulged the secret of extreme rapidity. We may have improved upon his methods of arriving at the result, but have scarcely advanced far beyond the point at which he left the process.

Yet, at the present day, it is an undoubted fact that feats and effects are attempted, and results actually produced, that would have appeared hopeless in the earlier period referred to, and that by comparative novices in the practice of photography. True it is that some of the most expert of the earlier workers with gelatine plates—and these were almost entirely amateurs who had had previous experience with dry plates of a slower description, and who, therefore, were more familiar with the mode of development—turned out as curiosities examples of extremely rapid work that would even now be considered remarkable; but, for the most part, the exposures attempted were not much quicker than wet collodion. This was partly due in most cases to the difficulty in persuading the old advocates of wet collodion that the new process was really so much more rapid, and partly to the fact, already alluded to, that the method of development was entirely new and different from that with which the majority of workers had been familiar for so many years.

It was chiefly the amateur section, who had been familiar with alkaline pyro in conjunction with dry-collodion plates for a matter of seventeen or eighteen years previously, and who, moreover, took an intelligent interest in the preparation of the plates, that produced the best and most rapid results—at any rate, in the very early days; though the professionals soon woke up to the advantages of, and the power given by, the new plates.

It is needless to remind your older readers, though it is probably beyond the knowledge of the majority, that the marvellous rapidity, as it was then considered, of the gelatine emulsion was first demonstrated in 1878 by Mr. Charles Bennett, who exhibited pictures taken by ordinary gaslight, a feat hitherto perfectly impossible in anything like the same time. His exposures extended, if I remember rightly, from an hour upwards; one that I have in my possession at the present day, representing a drawing-room interior, and exhibiting not the least symptom of under-exposure, was at that time considered a wonderfully quick piece of work. But during the past Christmas I saw an attempt—unsuccessful, it is true, in the strictest sense—to photograph a gaily decked and illuminated shop front by its own light, the exposures being reduced to two and four minutes respectively, and probably with double the latter success would have been obtained. Still more recently, I have seen perfectly exposed negatives of the stage and scenery of some amateur theatricals taken with exposures of about fifteen minutes; yet in past years, with all the additional advantages of a first-class London theatre, I have seen twice that time fail.

With the extraordinarily rapid and ingenious shutters of the present day, many very remarkable feats have been performed; but with far less perfect appliances, both mechanical and chemical, some of the earlier productions would be hard to beat. I look back particularly to an instantaneous picture by Mr. Bennett, representing a lady pouring water from a jug on to a foliage plant, the falling and splashing water being even more perfectly rendered than we are accustomed to see it nowadays with shutters of the most rapid description. Then, again, *The Flying Dutchman*, travelling at sixty miles an hour, by Marsh Bros., was quite equal to anything of the sort done since, and Mr. F. C. L. Wratten's first series of views of the University Boat Race has never been surpassed, if equalled, up to the present time.

Now, although acknowledging that the general run of plates of to-day are perhaps as far ahead of most of the commercial plates of, say, 1879, as those were of wet collodion, I mention the above instances to show that there were plates then which, in capable hands, were quite up to work of the most exacting description, just as in the older wet-collodion days there were "giants" who succeeded in turning out instantaneous pictures that have scarcely been surpassed up to now. On the other hand, I can recall many attempts at instantaneous work upon plates of good repute commercially that have turned out miserable failures, although under similar conditions at the present time I should certainly use a quicker shutter or a smaller stop. I remember especially one instance of attempting a view of St. Paul's from Bankside, with moving steamers and boats, the day being a fine one in early summer, and the lens a rapid symmetrical, with full aperture, or nearly so. When I say that the shutter was not quick enough to prevent the hopeless blurring of a rowing boat in mid-river, and that the plate was dreadfully under-exposed, it suffices to prove that the emulsion employed must have been very different from what we are accustomed to now.

Yet this was a type of the ordinary commercial plate of the day. I do not use the term "ordinary" in its later sense of "slow" in comparison with "instantaneous" or "extra rapid," but simply the standard plate, few makers of that time having adopted the plan of sending out half a dozen different sorts of films—such a plate, for instance, as would give from eighteen to twenty on the Warnerke scale, though that had not been introduced at the time I speak of. If such a plate failed then to give a picture, at least a satisfactory one, when it would now, under similar conditions, be hopelessly

ruined from over-exposure, it argues that some other influence must be at work, and the simplest inference is that it must be the development that differs.

When we consider, however, that alkaline pyro is practically the same now as it was then, or, at least, that if the formula then employed were used now it would produce a different result, and also that that form of development was not new to us by a good many years, the change can certainly not be laid wholly to the score of development, although, as I shall try to show, development may, in some instances, account for an apparent increase in the general rapidity of the plate.

For my own part I am inclined to attribute the difference, not to any actual increase in the rapidity of the plates—except to a slight extent—but to a very great improvement in their general quality brought about by the introduction of improved methods of production, and a better understanding of the principles involved in the preparation of the emulsion. In other words, the plates of the present day enjoy an immunity from fog of various kinds, to say nothing of other faults, that was undreamt of at the period I am going back to. Then a certain amount of fog was supposed to be a necessary concomitant of sensitiveness, and so perhaps it was with the methods of emulsification then in vogue. Certain it is that, with the great majority of plates with an extremely short exposure, any forcing, or even prolongation of development, gave rise to fog, which when once apparent arrested all further progress. In fact, this inherent fog had the practical effect of limiting the strength of developer it was possible to use, and so limited also the practical sensitiveness of the film. The only possible way in which an instantaneous exposure could then be treated was by the use of a weak, or at least only moderately strong, developer and extreme patience, and it is noticeable that all those operators who excelled in the art of "getting most out of a negative" were those who were most liberally endowed with the virtue of patience.

It was a by no means uncommon occurrence in those days, when so many, both amateurs and professionals, prepared their own emulsion and plates, to come across a batch of one or the other that happened to exhibit a greater than usual freedom from fog, but from what accidental reason it was impossible to discover. Almost invariably in such cases that emulsion or those plates were found to be unusually adapted for quick work; not that they developed any more rapidly than others, but simply because they permitted a longer application of the developer to coax out tardy details.

With the more modern plates, and their freedom from light or chemical fog, brought about by the care and system in manufacture that experience has taught, the power thus given of prolonging development is even greater than in the chance cases referred to, and, moreover, it permits a stronger developer to be used without danger of inducing incipient fog. Besides which, some of the newer developers introduced appear to exert so very slight a tendency to abnormal reduction that, given a plate absolutely free from fog of any kind, if such be possible, then the strength, it would appear, might be increased indefinitely. At any rate, in practice such is found to be the case to a far greater degree than is possible with pyro, and hence the character given to eikonogen, amidol, and metol, of materially reducing the length of exposure. W. B. Bolton.

JOTTINGS.

The electropathic exudations of that brilliant luminary of the firmament of curative electricity, Mr. Cornelius Bennett Harness, may or may not possess the remarkable properties which their gifted inventor claims for them; but, as to the wisdom of the philosophical principles upon which the famous belts, at the modest price of five guineas each, were conferred upon an eager and suffering public, there can be no two opinions. It is flawless—of its kind. "Never mind talking to the patients about electricity," was the substance of Mr. Harness's instructions to his assistants, "but—sell the goods." The goods, were sold and so were—but no matter. I allude to this picturesque development of the modern commercial spirit for the purpose of humbly expressing my opinion that Harnessism is gradually extending its influence in the photographic world. Of course this is only another way of paying a pretty compliment to enterprising men of business, but it is undoubted that there are on the photographic market just now many products, concerning the effective properties of which there is certainly as much question as there was about the efficacy of Mr. Harness's belts; and with that I take leave of the point, merely hoping that photography and photographers will ultimately be nothing the worse for the veneer of ultra-commercialism with which both are at present "sicklied o'er."

Mr. E. W. Foxlee's able and timely paper on *Carbon Printing*, which was read before the members of the Photographic Club a few weeks ago, reminds me that I have long intended to say a word or two in favour of this most charming and elegant system of printing, from the point of view of all-round simplicity. I suppose there is no doubt that carbon printing is steadily rising in public favour, otherwise it would be difficult to explain how it is that several firms are now making a speciality of the process *ab initio*, where a few years ago it was in the hands of one, or, at most, two. Of all the methods of photographic printing at present in vogue, the carbon process is perhaps, the only one which gives results universally acceptable on technical and artistic grounds. It is comparatively easy and cheap to work; it is guiltless of the charge laid against so many of its rivals on the score of instability. You are not perplexed as to which developing combination suits it the best, the labyrinthine intricacies of toning and fixing do not trouble you, spots and yellowness, and the innumerable other plagues that afflict all silver and platinum methods, cause you no anxiety. A friend of mine has a theory that water is the primarily active agent in the development of the latent image on silver haloid. The theory finds practical application in the carbon process, where the one indispensable solution is that cheap and inoffensive chemical compound which Dr. Burton Coxe calls hydroxylmonohydride, but which humbler and less learned mortals, such as myself, are content to designate water.

Stereoscopic photography, like carbon printing, also appears to be in the revival stage. If we are to believe all we read about it, this branch of photography has been reviving for a good many years past, and has not "come to" yet. It is very interesting and amusing, I must concede, to study binocular vision, the stereoscope, and other quasi-scientific points involved in twin-lens photography; but for the life of me I could never understand the extraordinary fondness which so many people profess to have for this kind of work. I say "profess to have," because, although there is a great deal written and spoken about stereoscopic photography just now, I don't believe that it is practised by more than a few cranks and fad-hunters, who delude themselves into the belief that a stereoscopic photograph possesses beauties which no sensible, unimaginative photographer can see. I never look at a stereoscopic picture without being irritated by its cut-and-dried artificiality and unreality, and its obviously bad imitation of natural effects. I must confess never to have taken a stereoscopic picture in my life, but what I have seen of the trouble of preparing the slides or transparencies, and the physical nuisance in viewing them, in order to get a feeble, unsatisfactory, and unconvincing effect, has made me more than ever a one-lens photographer. *Chacun à son goût*, of course, and one-lens photography is my *goût*.

It is with considerable sorrow that I observe the continued growth and expansion of the personal element in photographic journalism. Time was when a decorous and respectable tone uniformly characterised the periodical literature devoted to photography, but an increase in the number of photographic publications appears to have produced a change for the worse in the manner of their contents. Is this due to the evil example of that unclean and leprous thing, the New Journalism? I should have thought that photography required to be recorded and discussed in a becoming and serious manner, to the exclusion of all ephemeral chatter; but it seems I am wrong, for, when the editors of some of the photographic papers are not engaged in slanging duels over the circulation of their respective organs, they

are bickering and quarrelling about printers' errors, hoaxes, plagiarisms, imitations, and so forth, all of which, of course, tends to occupy space which might be filled with matter of more profit and instruction to their readers. Modern photographic editors appear to imagine that their respective papers simply exist for the ventilation of their private wrongs and crotchets. As for the attacks and satires on individuals which appear under opaque *noms-de-plume*, I cannot too strongly condemn and deprecate them. My one consolation is that the staid and academical columns of this JOURNAL are unequivocally closed to the admission of such absurd and uninteresting effusions. I call them uninteresting deliberately, my belief being that the photographic public has no taste for personalities, in which rightful feeling it will ever be my constant aim to encourage it.

Reference to stereoscopic work reminds me that in this JOURNAL for February 9, page 93, there is published the specification of a patent in which a claim is made for dividing the open space of the inside of a camera by a sheet of indiarubber or other material for stereoscopic purposes. The artless patentees say:—"In carrying out our improvements in a photographic camera, we make the ordinary camera for half-plate work, and so arrange the inside of the camera that thereby we can take stereoscopic views therein. We divide the open space of the inside of the camera by placing therein an indiarubber sheet right down its centre; this indiarubber sheet is attachable and detachable to the camera, by being fastened at each end to a piece of brass, and also notches are made in the back and front frames of the camera for each piece of brass to lodge therein, and to hold in position the sheet of indiarubber, dividing the inside of the camera for stereoscopic work." If I had as many pounds in my pockets as there were, in the old, old times, cameras fitted with dividing arrangements painfully like the one just described, I should be a rich man. Again I say, as I have said before, it is a scandal that the English Patent Office should profit by the peculiar combination of innocence and ignorance that distinguishes so many modern "inventors."

Some poor man who wants to get away from his quarter of the globe asks, last week, for the best seaside place to pitch on for ferrotype work, and whether he would require a licence. Answering the latter part of the question first, I believe that many of the Town Councils of seaside places limit the number of itinerants, and compel those holding pitches on the sands and beaches to take out annual licences. In the interests of the comfort of visitors, this is a wise and humane regulation. At some places a complaint of importunate touting ensures a revocation of the licence. As to the first part of the question, my advice to the querist is to write the names of the principal seaside places on slips of paper, shake them up in a hat, draw a slip, and go to the place thus indicated. One seaside place is just about as good as another to starve at. COSMOS.

REVIEW OF THE THEORY AND USE OF URANIUM COMPOUNDS IN PHOTOGRAPHY.

I.—INTRODUCTORY.

THOSE who have not made themselves acquainted with the earlier literature of photography will perhaps be ignorant of the great place which uranium compounds promised at one time to take in photographic processes. That this promise has not been fulfilled is due to a variety of causes, some at least of which will be pointed out in the following article.

At the present time there seem to be indications of a revival of interest in these compounds, and there certainly is abundant room for the further investigation of those obsolete processes, which were acknowledged by the leaders of photography, more than thirty years ago, to be capable of producing results of surprising delicacy and beauty.

One of the initial difficulties which besets those who seek to discover a new process, or to improve upon an old one, is the want of a ready means of knowing what has already been done in that direction by other workers; for it is only by building up upon the foundations laid by previous investigators that true progress can be made in scientific research. It is with the object of partly overcoming this difficulty that this article has been written, in order to bring together, for easy reference, the chief results which have been already achieved, and are scattered throughout nearly half a century of English and foreign literature.

II.—CONSTITUTION AND REACTIONS OF URANIUM SALTS.

Photographic experimentalists are not so much concerned with the source and preparation of the metal uranium as with the chemical properties of its compounds; and here, at the very outset, we are confronted with the difficulty that it is not quite certain if the exact constitution of uranium salts is definitely known.

Two classes of compounds are known to exist, viz., the uranous compounds, of which uranous chloride, $U Cl_4$, and uranous sulphate, $U(SO_4)_2$, may be taken as the type; and the uranic compounds, supposed to contain the bivalent radical UO_2 (uranyl), exemplified in uranic nitrate, $UO_2 (NO_3)_2$, uranic chloride, $UO_2 Cl_2$, and uranic sulphate, $UO_2 SO_4$.

In general chemical properties, uranium compounds bear a close resemblance to those of iron. Thus, the uranous salts are powerful deoxidising agents, reducing gold and silver compounds to the metallic state. Uranous sulphate was shown by Monckhoven,* in 1861, to be capable of being used as a developer in the wet-plate process; and, later, Fabre† advocated its addition to the ferrous sulphate developer to preserve clearness in the negative. The uranic salts also pass easily by reduction into uranous compounds.

The following table shows the characteristic behaviour of these two classes of compounds:—

Reagent.	Uranous Salts (green).	Uranic Salts (yellow).
1. Caustic alkali (ammonia, potash, soda)	Red-brown gelatinous precipitate of uranous hydrate	Yellow precipitate of alkaline uranate.
2. Alkaline carbonates	Green precipitate, soluble in excess	Yellow precipitate, consisting of double carbonate of uranium and alkali metal, soluble in excess, reprecipitated by caustic alkali, or by boiling.
3. Ammonium sulphide	Black precipitate of uranous sulphide	Black precipitate of uranic sulphide.
4. Hydrogen sulphide	*Nil*, in acid solutions	*Nil*, in acid solutions.
5. Potassium ferrocyanide	Red-brown precipitate	Red-brown precipitate, soluble in ammonia to yellow liquid.
6. Potassium ferricyanide	Red-brown precipitate	No precipitate.
7. Silver nitrate, gold, platinic, or mercuric chlorides	Metal deposited	*Nil*.

Among the salts of uranium, the nitrate has hitherto been most extensively used in photography. This substance, more properly called uranyl nitrate, has the formula $UO_2(NO_3)_2$, $6 H_2O$, and crystallises as a yellowish green deliquescent salt, readily soluble in water, alcohol, or ether, and rapidly reduced by the action of sunlight, in the presence of organic matter, to uranous nitrate, and probably an insoluble oxide. At the same time oxygen is evolved. The change may possibly be represented by the equation

$$2 UO_2(NO_3)_2 = U(NO_3)_4 + UO_2 + O_2$$

In a precisely similar way the sulphate is reduced.

$$2 UO_2 SO_4 = U(SO_4)_2 + UO_2 + O_2$$

These reactions may be taken as the general type of the photo-reduction of all uranyl salts, but the presence of organic matter seems to be essential to the process.

The acetate, $UO_2(C_2H_3O_2)_2$, H_2O, is much used in the analytical laboratory for the estimation of phosphoric acid, the phosphates yielding a precipitate of uranium phosphate, insoluble in acetic acid. It is possible that photographers might use this reaction for the recovery of uranium from residues; but this is merely a suggestion, and has not yet, it is believed, been put into actual practice.

The organic salts of uranium, such as the oxalate, citrate, and tartrate, have been but little investigated, and might possibly repay the experimentalist. Most of these salts may be easily prepared by dissolving uranic oxide in the corresponding organic acid.

J. VINCENT ELSEN.

* *Kreutzer's Zeitschrift f. Phot.*, iii. p. 173.
† *Bull. Assoc. Belge*, vi. p. 199.

(*To be continued.*)

PHOTO-MECHANICAL NOTES.

It is surprising, when one comes to think of it, what an indispensable part the salts of chromium play in photo-mechanical processes. Robbed of these compounds, the process-worker could do practically nothing in the present state of our knowledge, for, although there is bitumen to fall back upon for some purposes, it cannot in any way compare with the bichromates for speed and general utility. It is impossible to call to mind, off-hand, the manifold ramifications of Mungo Ponton's discovery, but the principle of all is the same as it was in its inception, viz., that certain organic substances—notably, gelatine and albumen—when treated with a chromic salt, such as bichromate of ammonia or potash, become insoluble. The property of attracting a fatty ink, which certain prints in bichromated albumen or gelatine also possess, cannot be regarded as a distinctly additional chemical action, for, as a matter of fact, it is only by reason of the organic matter becoming insoluble, and therefore resistive of dampness, that the fatty ink will "take" on this dry surface whilst being repelled by the dampness which can be applied to the soluble parts. That this is so is proved by the discovery of Warnerke that, if ordinary bromide of silver paper is exposed under a "line" negative, and developed with pyrogallic acid, the lines acquire the property of attracting fatty ink, simply because they are rendered, to some extent, insoluble by the tanning action of the pyro. It has since been found that a bromide print developed with ferrous oxalate has the same property, if, after development and before fixing, it is immersed in a twenty per cent. solution of potassium bichromate.

Warnerke's discovery, when first announced, struck me as an exceedingly promising process in theory in its application to photo-lithographic transfer work, but I regret that its apparent advantages were not borne out in practical trial. There was a difficulty in getting the lines sharp and the whites clear of the ink. The ordinary bromide paper was probably too rapid for the purpose, and, therefore, over-exposure and over-development were hard to avoid, the natural effect being a want of sharpness in the former case, and degraded whites in the latter. Then, again, the coating of an ordinary bromide paper is too thin and too soft for photo-lithographic purposes. Hence the thin, greasy ink went through the gelatine and soiled the paper. I did not care to make my own bromide paper, so the process went "by the board." A manufacturer will probably some day take up the idea, and make a good thing out of it, as has been done, unacknowledged, with many another idea from Mr. Warnerke's fertile brain.

A good deal of progress has been made, though comparatively recently in the application of the half-tone process to photo-lithography. By that I mean half-tone work with the screen, for we are as far behind as ever in photo-lithographic processes in which advantage is taken of the reticulation of the gelatine, possibly because nobody seems to care to take the trouble to experiment in this direction. There may be a field for further discovery therein, but those who have anything to do with processes in which dependence is placed on the reticulation of the gelatine will tell you there is a great amount of uncertainty attending it, and in these days of hurry-scurry process work uncertainty will not be tolerated for a moment. However, if we take a negative by the screen method, and print from it on to photo-transfer paper of a suitable kind, the print can be transferred to stone, and worked off in the ordinary way. The advantages are that there is no etching, mounting, and the like tedious operations, whilst vignetted work can be readily done, as the print being on the surface of the stone, the paper does not "dip," and leave a hard edge all round the picture. Moreover, lettering and design can be either transferred at the same time, or drawn direct on the stone. For colour work the key can be put down by half-tone photo-transfer, and the colours by ordinary methods.

Photo-lithographic work is really one of the easiest of the photo-mechanical processes, and requires the fewest materials. This being so, it may be commended to photographers, and their best plan is to work hand-in-hand with neighbouring lithographers, supplying the latter with transfers. The one would thus do that part of the work which the other would find the most difficult. Those photographers who are familiar with the carbon process would find photo-lithography exceedingly easy. The prepared paper can now be bought just as readily as carbon tissue in the proper quarters, but only in an insensitive state. There are three well-known makers—Jaffé, Albert, and Husnik. Between the first two there is nothing to choose, but the paper of the last maker, it is said, does not keep, and chiefly for this reason, if for no other, it is not popular among the leading workers. From my own experience, I can recommend the Jaffé paper, which is certainly easy to work.

Whichever brand of photo-lithographic paper is used, it must be be remembered that there are two kinds—one with a highly glazed, hard, and strongly adhesive surface for half-tone work, and the other, with natural surface, for line work. In either case the method of sensitising is the same, viz., upon a bath composed of one part by weight of bichromate of potash to twenty parts by weight of water, with as much liquor ammonia added as will turn the solution a bright yellow. Sufficient solution is required to well cover the bottom of a deep dish, as the paper has to be sensitised by completely immersing, coated side uppermost. As the temperature of the solution should be between 66° and 68° Fahr., it is best to use metal trays on the water-bath principle. When the paper is completely soaked through and limp, it may be removed and hung up for drying, which must not be accelerated by heat. The half-tone paper is best dried by squeegeeing down to a piece of plate glass, previously well cleaned and waxed, or rubbed with French chalk. In this latter way I have found that the paper will dry in a warm room in about four hours. The negatives used must have clear lines, with perfect density, and it is advisable to print in diffused light. Ordinary spring-pressure frames are used, and the print may be examined during the process of printing, if care is taken not to expose it to a strong light. When printed, the surface is coated all over with an even tint of photo-transfer ink thinned down with poppy oil and applied with a velvet roller, which must be charged from a thin film of ink previously distributed on the slab with an ordinary printer's roller. The print, coated with ink, is next immersed in a dish of cold water for fifteen minutes, after which it is laid out on a slab and the water gently blotted off. The velvet roller is again applied, and this time it will pick the ink off from the whites until they are tolerably clear, and the remaining scum may be wiped off with a damp, soft sponge. The print is allowed to dry without the aid of heat, and then is ready for the lithographer, who will transfer it in the ordinary way.

Wm. Gamble.

WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Remembering the signally fine display of members' work which the West London Photographic Society got together for its annual Exhibition last year, we must own to a feeling of considerable disappointment at the fifth annual Exhibition, which was held at the Chiswick School of Arts and Crafts on Tuesday and Wednesday last. Not only was it numerically smaller than its predecessor, but it fell a long way behind it in point of quality. Several of the ablest of the Society's workers, notably Mr. Hodges (the President), Mr. Whiting, and Mr. Whitear, were unrepresented. Nevertheless, the Exhibition, all things considered, was a fairly good one, although the elimination of a lot of commonplace efforts would have left it very small indeed, while the pictures were tastefully hung, many of them being artistically framed. The Judges were Mr. Alfieri, Mr. G. C. Haité, and Mr. Hollyer, and they awarded a silver and two bronze medals. They also read the Society a lecture on the comparative paucity of the artistic and technical merit of the display.

Mr. James J. Adam, with two poetically conceived views of Isleworth and some admirable winter studies, quite sustained his reputation, while Mr. L. C. Bennett had ten frames, most of them in quite his best style. We must humbly own, however, that *The First Gleam*, a fearfully nebulous river-side view in a hideous combination of green and brown tones, left us in doubt as to whether Mr. Bennett did not send it in with his "tongue in his cheek," so to say. The same gentleman's *Going Down with the Tide* (a study of the river below bridge), *Drifting Down* (a hazy rendering of a similar subject) and *Wapping Pier*, (silver medal, an effect of gloom and darkness), and several landscapes were full of high artistic feeling. Mr. W. A. Brown showed good work, of which we liked *The Mill on the Common*, a simple study well rendered, and a pretty view of an old-fashioned village, Blewbury.

A strong hand was played by Mr. W. S. Rogers, who took a bronze medal for a river scene, *Darkness Falls from the Wings of Night*, and also showed several other pleasing views, notably, *Old Thames Bed* (a river shore bit, crisply treated), and two rural excerpts, *The Road to the Farm* and *Midday Repose*, a pretty cattle bit. Mr. H. Selby, among other excellent examples, had a *Thames Embankment* view, which he treated with pictorial success. Mr. Leslie Selby had a softly rendered *River Scene* and other charming subjects. A bronze medal went to Mr. G. E. Varden, for a cleverly composed study of shore and craft at Strand-on-the-Green; while, of the remaining exhibitors, Messrs. J. Wilson, C. Winter, G. Way, and A. W. Scanlan deserve mention. The Exhibition was noticeably poor in portraiture and figure subjects.

FLASHLIGHT PHOTOGRAPHY.

Under the chairmanship of Mr. J. C. Oliphant (Vice-President), the fifth Ordinary Meeting of the Edinburgh Photographic Society took place on February 7. The principal business was a paper on *Flashlight Photography*, by Mr. A. H. Baird, accompanied by lantern illustrations of work done with the Todd-Foret lamp, and a demonstration of its working power. Mr. Baird stated his experience with flashlight work dated from January, 1888, and his experiments were then with the magnesium powder sprinkled more or less thickly on a well-teased pledget of gun-cotton, which he placed upon a plate of metal, a fire shovel suiting the purpose as well as anything else. This was fired at a convenient distance and height from the sitter—if a portrait—and in a proper position to suit the light and shade wanted upon the subject. A transparency from this first picture would be shown on the screen with the other illustrations. The methods now in general use might be divided into four: 1. The gun-cotton method. 2. The pyrotechnic mixture method. 3. The puffing through the flame method. 4. The continuous blast method.

The speaker made no mention of the various other earlier modes of using magnesium in wire or ribbon as an aid in photographing, although much good work had been done by their use and very ingenious apparatus constructed for the purpose, confining himself entirely to the use of the powder as a flash-producer. The first method has been described, and of the second, or pyrotechnic mixture, method he had no experience, but probably some member present might enlighten them. However, for the information of those interested, he might give the following formulæ taken from this Journal of 1889, page 807:—

Pot. chlorate	1 part.
Pot. ferrocyanide	1 ,,
Magnesium powder, *quant. suff.*	
Pot. chlorate	2 parts.
Pot. ferrocyanide	1 part.
Sugar	1 ,,
Magnesium powder, *quant. suff.*	
Pot. chlorate	9 parts.
Wood charcoal	½ part.
Sulphur	¼ ,,
Magnesium powder, *quant. suff.*	

It was not, but should have been, stated by Mr. Baird that these compounds are generally of enormous explosive power, and that the substances should only be united after each has been reduced to powder separately, and then mixed carefully with a bone, horn, or ivory spatula, and not compounded in a mortar.

The third, or "puffing through the flame" method, was one which had been attended with considerable success, the only disadvantage lying in its *individual* capacity for extensive work. To illustrate this, suppose the interior of a very large building required to be photographed, a very considerable number of lights would be needed, and the consequent inconveniences attending a large battery of lamps, and yards upon yards of rubber tubing with their connexions, the possible going out of one or more lamps before every thing was completely in readiness (often a principal lamp), besides all the labour attendant on such a number, made this method rather troublesome and precarious for more than one light.

For small work and experimental purposes the lecturer passed round a lamp he had found of considerable service. It was made of a glass ⊥-tube, with a brass-tube spirit lamp, with wick attached underneath. By means of a ball or tube of rubber, the magnesium powder, which is placed at the junction of the limbs, is projected through the spirit flame, and becomes ignited. The thumb is placed over the open end of the upper end when the puff is made. The breath and mouth of operator can also be used with this. The fourth, or "continuous blast method," was the mode intended for use that evening. This, with a proper lamp, admits of the production, at will, of an instantaneous or continuous flash. The flash itself, being in the form of a large sheet, is calculated to have an illuminating surface of 1150 square inches. The size of the flame can be regulated, according to requirements, by a screw fitted for the purpose, so the full bore of the orifice may be used for an instantaneous flash, or reduced so that the light is continuous till the magnesium powder is exhausted. If occasion requires it, a drop-shutter exposure can be made during the continuous flash.

The Todd-Foret lamp was here shown, and its construction explained by means of a section of one of the lamps, which showed the advantage of its method of lighting of wick, and the mode of working of the safety valve, which prevents the possibility of the flame passing downwards to the reservoir. The emission of air from the bellows and its refilling, which is very ingenious, was illustrated by loading the reservoir with fine sifted sawdust, and driving it out, either rapidly or slowly, the action being perfect. With the magnesium powder, though of so much more weight, the action is quite as perfect.

The question of focussing in the dark was then gone into, the lecturer's practice being to use a lighted candle as the object to be focussed. First, the camera is placed as nearly in position as possible, the candle-holder beside the special object to be photographed. The candle being sharply focussed, the object is bound to come out sharp on the plate. If an interior, the candle is placed at two or three successive points, to check the focussing. To determine the angle embraced, these points are noted on the ground-glass screen of the camera, the candle being moved more or less till its image reaches the edges of the screen, and the relative amounts of floor and ceiling determined in the same way.

Lenses.—According to requirements, a portrait, a rectilinear, or a wide-angle, lens is used; but for interior work, where as much as possible of the subject is usually wanted, a wide-angle is the most used in practice. For the demonstration in the hall, Mr. Baird used a five-inch wide-angle rectilinear, with stop *f*-22, and a Paget plate, and he gave those who had cameras, and intended to use them, his ideas, which were for Ilford ordinary plates, to use stop *f*-11, Ilford white label, or Thomas *f*-16, Ilford red label, Paget or rapid Cadett *f*-22. He gave these hints, knowing the power of the light and the relative rapidities of the various plates.

In reference to the position of the lamp in this kind of work, and for interiors generally, and using one lamp only, Mr. Baird found the top of the camera the best place; but, where an extensive interior had to be taken, and several lamps used, one was placed on the camera top, the others out of visibility on the screen and where the lights would be most effective. One point was noted, that, where only one lamp could be used, and the light having to illumine or penetrate a considerable distance, a reflector of any simple kind, such as a sheet or even a newspaper, proves of considerable service; and he has also found that a lengthened, continuous light was more efficacious than the instantaneous flash for this class of subject.

Arrangements were then made for taking a general view of the hall and its occupants, and the resulting negative—a half-plate size—is very satisfactory. An exposure of about one-fourth less light might have suited this plate better. The others may be reported on later if necessary, as there were several members present at work, some with cameras on stands, others with hand cameras for snap-shots.

At the close of the demonstration, the Chairman (Mr. Oliphant (Vice-President) proposed a hearty vote of thanks to Mr. Baird, which was cordially responded to.

A number of transparencies were thereafter shown, the first being a group of two figures, taken as already alluded to by the gun-cotton and magnesium flash—this taken by portrait lens *f*-6. The next was of the flash itself, produced by the Tod-Foret lamp, from which is computed the area of 1150 square inches claimed by the makers. It was not stated whether this computation comprised *both* sides of the flame, which is at the orifice about 1¾ inches wide, the wick being about that across. Owing to the intense direct light, this exposure was made by pinhole. These were followed by several showing effects of assisted daylight, comprising interiors of darkly lit rooms, lobbies, halls, and studies, showing every possible detail, all taken with one lamp. Succeeding these were examples showing work done with from two to five lights. Those of the manufacturing chemical works of Duncan Flockhart & Co., with the work-people all busy at work, were very striking. These were followed by "At Home" portraiture, single and grouped figures; and these, again, by a number of views taken down in a limestone pit, where there was no daylight, showing the men at work, &c. All were explained by a running comment, fully explaining the methods of procedure. The lantern part of the evening's work was finished with showing selections from a large number of slum-life interiors, several of which were pitiful and gruesome enough, others showing the every-day life and appearance of the natives.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

The Council meeting, annual dinner, and annual general meeting of this Association were held at the Grand Hotel, Birmingham, on Thursday, February 8, 1894.

Mr. Thomas Fall was re-elected President, and the members of the Council remain the same as last year, with the addition of Messrs. Harold Baker, Richard Keene (Burton-on-Trent), and Thomas Illingworth (Halifax).

Amongst those present were Messrs. Thomas Fall, London; H. J. Whitlock, G. B. Mowll, J. Draycott, Harold Baker, and Beaufort of Birmingham; J. Crosby, Rotherham; G. V. Yates, Sheffield; D. Bordley, Stafford; F. Whaley, Doncaster; Warwick Brooks, Manchester; J. E. Eddison, Barnsley; T. Bromwich, Bridgenorth; Chevalier Lafosse, Thomas Illingworth, Halifax; Robert Slingsby, Lincoln; W. Barry, Hull; Hogg, Kendal; and A. Harrison Hill, Wordsley.

Mr. Thomas Fall took the chair, and the Report of the Council was read, from which it appeared that the Council had decided that certificates of membership should be forthwith issued. The Council also reported that, during the year, they had examined into the question of trade certificates, and found that, while the course of teaching at the Polytechnic, and possibly at other photographic schools, was practical, the examination of the City and Guilds of London Institute was very unsatisfactory.

The question of alleged unfairness of insurance companies in the payment of photographers' claims had been inquired into, and the Council recommended that all photographers should keep a book of orders and renewals in order to prove loss, and should also see that their insurance policies specified reasonable value for each negative. The Council strongly

recommended the Central Photographic Club to professional photographers. The Council had been represented at the meeting of the Photographers' Copyright Union, and recommended photographers to support the principle of demanding payment for use of their copyright pictures. The question of the marking of goods of foreign origin had been brought before the notice of the Council, and they reported that the Board of Trade was apparently very lax in enforcing the provisions of the Act. Several other items of the Council's report were mainly of interest to the members of the Association.

A motion for the increase of the subscription from 10*s.* 6*d.* to one guinea was brought forward from the last annual meeting, and after very little discussion it was unanimously decided that the subscription should remain as at present, at the lower sum.

The President then said that, though not much had been actually done by the Association during the past year, it had turned its hand to everything that it felt strong enough, with its small membership, to undertake. The social side of the several meetings had been very enjoyable, and many of the members had profited individually to a considerable extent by the information gained from meeting with their fellows. He had long been considering what the Association ought to do. It was an undisputed fact that trade enlarging should never have gone out of the hands of the profession, nor should they have allowed the business of supplying photographic materials to amateurs to pass into other hands. The position of the professional, as compared with that of the small chemist or other tradesmen, who sold, perhaps, a tenth the quantity of goods the professional used, was anomalous and unfair. He suggested that the Association should go into the co-operative supply of goods to its members, by starting a central store with capital raised amongst photographers on shares in a limited liability company, each member to take at least 5*l.* or 10*l.* in shares. The store would be able to allow full dealers' discount to the members, and could probably defray its working expenses out of the cash discounts, and special discounts which it would receive as a large wholesale buyer. He proposed that the store should supply non-members, as well as members, but that only members should have the privilege of attending and voting at the business meetings. The customers of the Store should pay cash for their goods, and as these would frequently be sent direct to the customers by the manufacturers, the expenses and capital necessary would be very small. The photographers would become, as they ought to have been at first, the natural suppliers of amateurs, and would have a great advantage over many of the small dealers, because they would be able to give practical advice and assistance to those who purchased goods, and would thus probably increase the total demand for photographic materials. The store would be useful for the exchange of second-hand backgrounds, accessories, &c.

Mr. Thomas Illingworth, of Halifax, very strongly supported the idea.

In answer to a question by Mr. Crosby, Mr. Fall said the intention was to have the Store taken up by the National Association for Professional Photographers. If properly managed, it would become a big concern, and should secure a membership including practically the whole of the photographers in the Kingdom; they could then have sectional committees to deal with questions of granting certificates, copyright law, &c.

Mr. J. Crosby fully approved the idea so long as there was no attempt to manufacture apparatus or materials, but only to supply them. He thought that if this were undertaken, and full discount given, although professionals were very apathetic, they would come into the Association in great numbers. He proposed that a Photographers' Co-operative Union be formed. This was seconded by Mr. Bromwich and unanimously carried.

Mr. Crosby further proposed that a committee, consisting of Messrs. Thomas Fall, H. J. Whitlock, and D. J. O'Neill be appointed to draw up a prospectus of such an Association, and report upon it to a special Council meeting to be called. This was seconded by Mr. Barry, supported by Mr. Hill, and unanimously carried. It was decided that the next annual meeting be held in Leeds.

WOOLWICH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The second annual Exhibition of this Society was held at the Woolwich Polytechnic last week. Besides two members' classes and an open class, others were devoted to lantern slides, open and members', and there was a loan collection. The Judges were Mr. Basil Bradley, Mr. F. P. Cembrano, and the Rev. F. C. Lambert. For an affair of this kind the hall in which the Exhibition was held was well suited, it being large, lofty, and capitally lighted. Allowing for the circumstance that the Woolwich Society is both young and small, the Exhibition was passably good of its kind, although, without desiring to be ungracious, we must say that, while the open class and the loan collection included many capital examples, the members' work, all things considered, was not so meritorious as we expected it would be, recalling our impressions of the excellent start the Society made last year. Still, in many cases, great promise and some progress was shown; and, on the whole, the members' work was symptomatic of better things next year.

The Judges' awards were as follows:—

Class I. (Members).—Silver medal (39), W. Dawes. Bronze medal (31), V. Taylor. Bronze medal (43), W. Dawes (withheld by rules). Certificate (32), V. Taylor (withheld by rules).

Class II.—Silver medal (78), E. C. Forsdyke. Bronze medal (33), V. Taylor. Certificate (37), V. Taylor (withheld by rules).

Class III. (Lantern Slides).—Silver medal (withheld). Bronze medal, T. R. Ellis.

Open Class.—Silver medal (186), Charles Job. Bronze medal (160), A. Jeffreys. Bronze medal (177), Edward Hawkins. Bronze medal (211), W. M. Warneuke. Certificate (198), J. H. Anderson. Certificate (217), R. Keene. Certificate (180), H. J. Maskell.

Lantern Slides (Open).—Silver medal (withheld). Bronze medal G. Hankins.

In the members' classes the Hon. Secretary, Mr. W. Dawes showed some of his Pall Mall exhibits, also some small Belgian views of great merit. *Left by the Tide*, by Mr. V. Taylor, was a capital study of craft on the shore against forcibly rendered banks of clouds. He took a medal for a similar subject. The same gentleman's small frost scenes were cleverly rendered. The President (Mr. Dresser) was represented by some characteristic exhibits, many not for competition. Messrs. T. R. Ellis (winter views) and A. J. Allen were well represented, but some of the latter gentleman's work would not have suffered from better definition, his *Meditation*, a girl surrounded by trees, being obviously out of focus. Viscount Maitland, as usual, had some pleasing effects on rough paper, and in *Lazy Noon*, a red-toned cattle study, Mr. G. J. Gill escaped producing a really excellent picture by allowing it to drift into flatness. Mr. F. C. Mattinson, Mr. P. Godfrey (a small but admirable, truthful study of sunset across a river lined with trees, and some rural views) and others, exhibited work deserving of more than passing attention.

The open class was of quite considerable excellence. Among a beautiful series of large platinotype portraits by Mr. W. W. Winter, we liked *My Queen*, a softly lighted, pleasing lady's head, and *Out of Luck*, a contemplative picture of an old salt with a down-in-the-mouth sort of expression. Mr. J. J. Moore's *Horse being Broken In*, showing the animal apparently with two legs only, would surely make our friend Captain M. Hayes go green with horror at such a successful attempt at how not to do it. Mr. E. Hawkins' *What a Lark!* three gamins grinning over a joke, was an amazingly clever and successful bit of humour, and the same gentleman's view of Allington Castle was an admirable piece of *technique*. Mr. Dalby's *Cornflower*, a carbon portrait study of a girl, might have been less hard, but the figure was gracefully posed. Mr. J. H. Anderson had two highly effective and artistic views, *Evening* and *Sunset in Lower Pool*, the latter a deep red toned striking river effect. Mr. G. H. Banister's large portrait study was spoiled by a certain ghastliness of tone, and, to our thinking, he had killed a charming view, *Brienz, Switzerland*, by unsuitable mounting. Again, Mr. C. F. Archer, whose effects are usually soft and agreeable, had made the lighting of his portrait, *Youth and Beauty*, rather abrupt and hard. We have only space to mention that to this class Messrs. Alfred Jeffries, J. H. Gear, W. Scorer, Viscount Maitland, Warneuke, C. Moss, and others, had sent charming work. Mr. W. Thomas (a master of hand-camera work) and Mr. R. Keene (with his usual delightful platinum studies of architecture and landscape) were also well to the fore.

The loan collection comprised familiar examples by Gale, Davison, Dresser, Moss, the Autotype Company, Sinclair, and others.

The apparatus section was occupied by assorted collections by Messrs. Butcher & Son, Holmes & Watson, &c.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES WITH THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

We extract the following from the Report of the Committee of Delegates:—

The Committee of Delegates having decided that it was advisable that an annual report should be presented to the affiliated Societies of the work done by the Affiliation during the year, it has been thought best, in order that the series of reports so issued may serve as a complete history of the Affiliation, that this, the first of those reports, shall cover the whole ground since the movement was initiated.

It is now three years since the subject of a general union of photographic Societies was first seriously discussed, and in July, 1891, an invitation was issued by the Council of the Photographic Society of Great Britain to all British and Colonial Societies to co-operate with them in carrying out certain desirable objects with a view to the advancement of photography and the mutual benefit of the Societies concerned. Fourteen Societies responded promptly and favourably to this appeal, and a joint Committee was formed, which held its first meeting in February, 1892, and discussed, and, with the approval of the Council of the Photographic Society, formulated rules.

The Committee also came to an arrangement with the Council of the Photographic Society, by which one half of the subscriptions should be taken to cover all printing, postal, clerical and incidental expenses connected with the organization of the Affiliation, the remaining half being at the absolute disposal of the Affiliation Committee.

At the end of 1892 these fourteen Societies had increased to thirty, and in the year which has just closed this total had been brought up to forty-seven.

During 1893 the circulation of papers, lantern slides, &c., has been continued.

So popular a feature of a Society's programme has this become that no less than ninety-one meetings affiliated have been so provided for. Mr. Debenham's offer to demonstrate before affiliated Societies has also been accepted by seven Societies.

In the middle of the year, with a view to securing more uniformity in the judging and awards at photographic Exhibitions, the Committee invited those gentlemen whose names are well known both as Judges and exhibitors to a conference, with a view to their coming to an agreement upon certain lines, and to offer suggestions for the guidance of Societies with regard to Exhibitions.

The result of the conference was the publication of rules, which those present would consider binding on themselves, and without the observance of which they would refuse to judge, and also of suggestions or recommendations to Committees or other bodies who may have in their hands the organization of Exhibitions.

The Committtee hope to issue very shortly their programme of arrangements for 1894.

The following, amongst others, are some of the advantages which accrue to Societies affiliated:—

1. The circulation of papers dealing with technical and other matters connected with photography, such as cannot be properly communicated through the photographic press, that is to say, when they are accompanied by illustrations, examples, or lantern slides. The circulation of sets of lantern slides.
2. The exchange of dark rooms and similar local conveniences.
3. Admission for members of affiliated Societies and their friends to the Photographic Society's Exhibition at half the usual charges. Exhibits of members of affiliated Societies are admitted at half the charges made to non-members.
4. Admission, either free or at reduced rates, to lectures organized by the Committee of Delegates.
5. The assistance of Societies by the arrangement for them of demonstrations, &c.
6. Communication between the various Societies affiliated through the medium of the Photographic Society's *Journal*, which is the organ of the Affiliation, two copies of which are sent free of charge to each affiliated Society.

Our Editorial Table.

The Veil Lifted.

By A. Glendinning. London: Whittaker & Co.

In this little volume Mr. Glendinning has compiled the utterances of many of those who have written recently on the subject of psychic or "spirit photography," a prominent place being assigned to a paper on the subject communicated to the London and Provincial Photographic Association about a year ago. It is illustrated by twelve psychic photographs, and will prove acceptable to those interested in the subject. It appears, from a remark on the general subject made by the Right Hon. A. J. Balfour, M.P., in his late presidential address to the Society for Psychical Research, that it is very desirable efforts should be made to "discover what laws this strange class of phenomena obeys." Price 2*s*.

Dr. Andresen's Handbook of Developers.

Messrs. Arthur Schwarz & Co. send us a pamphlet containing formulæ for the use of the various new developing substances manufactured by Dr. Andresen, and for which they are agents.

Photochroms.

The Photochrom Zurich Company, of 7, St. Paul's Churchyard, E.C., are placing before the public examples of a process of printing in the colours of Nature, of which they say, "They are not chromo-lithographs, nor are they coloured prints. They combine the truthfulness of a photograph with the colour and richness of an oil painting." We have seen specimens of this style of printing in colours, and we can testify not only to their remarkable fidelity to the colours of the originals, but also to their high artistic qualities. Such pleasing pictures should speedily achieve a great popular vogue.

Paget Matt Printing-out Paper.

The Paget Prize Plate Company, Watford, have sent us samples of their newly introduced matt printing-out paper. Upon submitting the paper to trial, we find that it possesses all the characteristics and good qualities which are looked for in this description of surface. Its manipulation is the same as that for the *glacé*-surfaced paper, a sulphocyanide toning bath and separate fixing bath being employed. Like the other excellent productions of this house, the matt paper will doubtless be popular. We learn that the Company are placing a collodio-chloride printing-out paper on the market.

Kloro Paper.

The Imperial Dry Plate Company, Cricklewood.

The enterprising Imperial Company are issuing a new print-out paper, appropriately termed "Kloro," and have given us the opportunity of subjecting it to trial. The following are the instructions for its use:—

Prints must be only slightly darker than required when toned and fixed. Hard and fairly dense negatives should be printed from in a strong light, weak and delicate negatives in the shade and through tissue paper. After printing, wash for ten minutes in running water, and immerse in an alum bath—

Alum	½ ounce.
Water	20 ounces.

Leave for ten minutes and wash again in running water for five minutes.

Any toning formula may be used, but the finest results are obtained with—

Sulphocyanide of ammonium	15 grains.
Chloride of gold	1 grain.
Water	8 ounces.

This bath gives beautiful purple tones; can be used at once, but will not keep. When toned sufficiently, place the prints in a bath composed of—

Common salt	1 ounce.
Water	20 ounces.

to prevent further toning. Well wash the prints in running water and fix in—

Soda hyposulphite	3 ounces.
Soda sulphite	1½ ounce.
Water	20 ounces.

Do not use the same fixing bath twice. After fixing, wash the prints for one hour in running water. The alum bath must be always used with a sulphocyanide toning bath, and also in hot weather with any other bath.

In our experiments with the paper we succeeded in obtaining the most charming quality of results, and it is safe to predict that "Kloro" will take a high place among contemporary print-out surfaces.



Horne's Double Dark Slide.

Mr. Horne, of 21, St. John's-square, Clerkenwell, sends us samples of a simple double dark slide made in cardboard, and selling, quarter-plate size, at a shilling each. The block conveys a good idea of the form.

On English Lagoons.

By P. H. Emerson. London: David Nutt.

Dr. Emerson's entertaining account of the voyage of two amateur wherrymen on the Norfolk and Suffolk rivers and broads is illustrated by eighteen views from photographs taken by the author. Alas! that they should be of such very tiny dimensions. Although a non-photographic book, it will make admirable reading for the increasing number of photographers who spend their holidays on the Broads. Dr. Emerson is a close observer and intelligent exponent of the dialect, the manners and customs, of the boatmen of that quarter of the British dominions.

Trade and other Catalogues.

The new catalogue of Ross & Co., opticians, New Bond-street, W., contains particulars of an immense number of those requisites for the manufacture of which the firm has long and worthily enjoyed such a high reputation. Among these we find the Concentric, the Goerz, and the Zeiss lenses, which are well known for their freedom from astigmatic and other error, and the home manufacture of which is confined to this firm. These and their other time-tried optical productions are described with all the fulness necessary. The catalogue embraces also cameras, shutters, enlarging lanterns, microscopes, and object-glasses, air brushes, stalking, naval, and other telescopes, opera glasses, &c.

Horne & Thornethwaite, 416, Strand, W.C., have issued a descriptive catalogue of astronomical and portable telescopes, with all their belongings. The catalogue is a very complete one, although the firm say, in a prefatory note, that it does not profess to give a full description of all their apparatus. It certainly does serve the purpose of affording a clear idea of the various instruments they supply.

Elliott & Fry, Baker-street, W., send us a list of portraits photographed and copyrighted by them. It contains 3700 names.

Mr. W. Perry, Folkestone, sends specimens of hatching and vignetting effects produced by him, and also a celluloid negative by the use of which these effects are obtained by double printing, or by the interposition of the film between the portrait negative and the paper.

A. Pumphrey, Stanhope-street, Birmingham. This gives particulars of a large stock of lantern slides and apparatus and stereoscopic views.

News and Notes.

Mr. R. P. Drage is expected home shortly from his Eastern tour.

Society fixtures for next week will be found under the heading of "Meetings of Societies."

To-night (Friday) Mr. D. S. Brearley, shows a series of Japanese views coloured by native artists, at the Central Photographic Club, Coleman's Hotel, 3, Henrietta-street, Covent Garden, at 8 p.m. Visitors are cordially invited.

On Thursday, March 8, the London and Provincial Photographic Association holds its annual Ladies' Entertainment at the Champion Hotel, Aldersgate-street, E.C. Tickets, 6*d.* each, may be had of any of the members or of the Hon. Secretary, Mr. Freshwater, 3, Fleet-street. The proceeds, after the payment of expenses, will be devoted to the Photographers' Benevolent Association.

Messrs. Platt & Witte, of Birkbeck-road, Kingsland, write:—"Our manufacturing premises were broken into last Saturday (the 10th inst.); valuable parts of machinery, tools, &c., were stolen, together with lenses, gauges, and various other goods. Besides much damage being done, show cases were smashed, doors forced open, locks wrenched off, desks and contents turned out and considerably overhauled.

The thirtieth Annual Exhibition of the Dudley Gallery Art Society was opened at the Dudley Gallery on Monday last. The pictures are exclusively water colours, and have little in common with the prevalent plague of impressionism. Nevertheless, photographers, especially those who devote themselves to landscape work, may pick up many a useful hint as to selection, composition, and lighting by a visit to the Exhibition.

A Combined Bath for P.O.P.—C. C., replying to Mr. C. E. F. Nash in our last, sends us the following formula for a combined bath:—Water, 1000 grammes; hypo, 250 grammes; potassium sulphocyanide, 30 grammes; acetate of lead, 10 grammes; citric acid, 8 grammes; alum, 8 grammes. To this mixture add 50 grammes from a 1 : 100 gold solution, and allow the bath a couple of days to ripen. Prints are put direct into the bath without washing, and should be toned in 5 to 8 minutes.

Another Black Sheep.—"Swindled" writes: "I have been properly swindled by a canvasser whom I set on a few weeks ago, and who has now absconded. I need not trouble you with the details, but I should very much like to prosecute if I could find him. He is of medium height, dark, age about twenty-six years, fairly stout. Now, if any photographer who has engaged a canvasser since February 6 who answers to this description will let me have a rough photograph of him, and forward same to me through your office, I should esteem it a favour. It would be an easy thing to get him to sit for a photograph by telling him a specimen of himself would be better to canvass with. I don't think I am asking too much of any photographer who is in any way desirous of protecting his brethren against such men."

Uranium Toning.—In the report of the Croydon Microscopical and Natural History Club (Photographic Section) meeting last week it was erroneously stated that the process had been improved by the addition of acetic acid. The use of acetic acid was an essential feature of the process when first introduced, and was indispensable, one of its functions being to counteract the hardening action of the ferridcyanide on the gelatine, keeping the film in such an open condition as to facilitate the rapid removal of the yellow stain produced in toning. It does *not* render the uranium deposit insoluble, but the addition of a small quantity of acid to the washing water permits the washing to be carried on for a much longer time without reduction of tone. Prolonged washing is, however, not necessary, and with most commercial papers five to eight minutes will remove the yellow stain.

The New Optics.—This is how the *Cork Daily Herald* reports a recent meeting of a local Photographic Society:—"Mr. Lund read an instructive paper on *The Value of Stops in Photography*, which he illustrated by means of diagrams. In the course of his lecture, he said the average length of exposure for ordinary land cameras to get a clear and distinct impression was from five to seven seconds, and the shorter the time the wider the field embraced in the lens. In double convex lenses the size of the image will vary immensely as the distance from the focus of the camera, and the time of exposure for a correct vision varies according to the degree of light and the quality of the lenses used. At the conclusion of the lecture Mr. Denny Lane, in proposing a vote of thanks, referred to an invention of the late Mr. Grubb, father of Mr. Thomas Grubb, the well-known photographer, which was the preparing of fine, smooth-faced lenses, which he described as being very ingenious."

A Society for Macclesfield.—A long-felt want to the photographers of Macclesfield and district has been at last supplied in the formation of a Photographic Society, and at a meeting announced for Friday evening last a goodly number appeared, all interested in the art. The following gentlemen were appointed to the various offices:—*President:* Mr. E. Woodward.—*Vice-Presidents:* Mr. J. Potts, J.P., F.S.S., Dr. Sheldon, Dr. Averill, Messrs. J. Hodkinson, J. Woodward Burgess, B. R. Leech, E. Bullock.—*Council:* Dr. Rees, Messrs. A. Sheldon, A. Bullock, W. H. Birchenough, W. G. Morris, T. H. Sherwood.—*Hon. Treasurer:* Mr. J. Pratt, District Bank.—*Hon. Secretary:* Mr. J. Barrett, 76, Pownall-street. Various suggestions being made by the members during the evening for the efficient working of the Society, the formation of rules, &c., further proceedings being held over to the next meeting. The Society may be congratulated on the election to the Presidency of Mr. E. Woodward, who is one of the first amateur photographers in the kingdom, a member of the Convention, and an ardent worker in all branches of photography.

Affiliation of Photographic Societies.—At the meeting of Delegates on Tuesday, January 30, the Secretary stated, in reply to Mr. Everitt (London and Provincial Photographic Association), that no reply had been received up to the present from the railway companies in reference to the increased facilities requested by members of affiliated societies, nor from the Photographic Society with reference to the abolition of wall-space charges to members of affiliated societies. The annual report and balance-sheet of the Committee of Delegates, which, in this instance, covers both 1892 and 1893, was discussed and finally passed. The following officers were then unanimously elected:—*Chairman:* Mr. Edgar Clifton (Photographic Club).—*Treasurer:* Mr. George Scamell.—*Auditors:* Messrs. J. W. Marchant (North Middlesex Photographic Society) and P. Everitt (London and Provincial Association). A vote of thanks was passed to the retiring officers for their services. With reference to a programme for the ensuing session, a sub-committee was appointed to arrange the same and report to the Committee of Delegates at its next meeting, the Committee to consist of Messrs. Everitt, Marchant, Oakden (South London Photographic Society), and Mr. Warnerke (Photographic Society of Great Britain).

Lord Rayleigh on Photometric Methods.—In the course of the first of his series of lectures on *Light*, Lord Rayleigh said that the common photometric method devised by Count Rumford consists in comparing the light to be tested with a standard candle by means of the shadows of some common object which they throw. The relative distance of the two lights is so adjusted that they give the same intensity of shadow, and the power of the light to be tested is calculated by observing its distance from the standard candle. But in view of recent controversy as to testing the public gas supply in London, it is interesting to learn from Lord Rayleigh that the standard candle is not by any means like Cæsar's wife. The same candle, he states, will often vary five per cent. in its intensity, according to the supply of air and the state of the wick, and a much greater variation may be expected between different standard candles. These photometric facts are, of course, rather elementary learning; but one or two incidental points mentioned by Lord Rayleigh in connexion with the subject are of somewhat fresher interest. A German photographer has recently shown that, so far as the chemical rays of the light are concerned, the principle of inverse squares cannot be accurately applied unless the experiment is conducted in a vacuum, so obstructive is the atmosphere to their passage. However, it is found that the human eye is, on the whole, remarkably accurate in judging of the relative intensity of different coloured lights. The great range of intensity covered by the human eye is also a very notable fact. In Egypt, for instance, the moonlight appears so bright that you can hardly keep your eyes open before it, and yet it is 250,000 times less intense than that of the sun. Probably, as the sun goes down, the iris of the eye expands into a fuller sensitiveness. Apparent differences of tint in white light seem to be mostly deceptions. The glare of the electric arc lamps seems blue when compared to gas, but in broad daylight it will be found to be rather yellowish than otherwise.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2462.—"An Improved Porous Saturator for Producing the 'Etho-oxo' Limelight for Single, Biunial, or Triunial Optical Lanterns." T. TIMBERLAKE.—*Dated February*, 1894.

No. 2499.—"Improvements in Lighting the Magnesium Fulminating Lamps used in Photography." Complete Specification. L. J. GORDES.—*Dated February*, 1894.

No. 2751.—"Improvements in Photographic Cameras." J. C. STITT.—*Dated February*, 1894.

No. 2829.—"Improvements in Connexion with Photographic Cameras and in the Sheaths for Holding the Sensitised Plates, and in Means for Changing and Storing the Same after Exposure." E. H. JACQUES.—*Dated February*, 1894.

No. 2935.—"An Improved Method of Making Printing Surfaces by Photographic Means." F. STERNBERG.—*Dated February*, 1894.

No. 2986.—"Improvements in Apparatus for Use in Taking Photographic Pictures." G. DICKINSON.—*Dated February*, 1894.

IMPROVEMENTS IN OR CONNECTED WITH PHOTOGRAPHIC CAMERAS OR APPARATUS.

No. 19,914. HARRY GAMWELL, 37, Wavertree-road, and CHARLES GAMWELL, 46, Low-hill, Liverpool, Lancashire.—*December* 2, 1893.

THE present invention relates more particularly to hand cameras, and has mainly for its object to provide, and comprises, a camera which shall possess qualities of an ordinary hand camera, namely that of carrying a battery or considerable number of sensitive plates, films, or the like, combined with that of being able to open it (without "bag" or other "dark" arrangements or the like, such as are now used) in the full light for manipulation, or for other purposes, without damaging or affecting said plates, or other sensitive media used, and at the same time enabling the plates to be exposed from outside.

In a camera of the above improved character or construction, there is employed a battery or series of closed and locked light-tight metallic sheaths of narrow width (namely preferably of just sufficient width to contain a sensitive plate, film-holder, or the like), each having a hinged door, the sheaths being arranged one behind the other—and in a plane normally at right angles to the axis of the lens—within a chamber at the back of the camera, and adapted to be moved up to the front of such chamber for the exposure of the sensitive surface, by taking the foremost one out (say after an exposure) by the hand, and placing it at the back, or in an intermediate position, whereby the succeeding sheath is moved up to the front, in the full daylight, and with the camera open, and without "bag" or other "dark" arrangements, whilst the door of the foremost sheath of the battery is adapted to be pressed open against the retentive action of the means or construction employed for locking or keeping closed the door thereof by a suitable device, or part of a device, within the camera, but operated from without, when exposing the sensitive plate or other media. Access to the sheaths and sheath chamber, for manipulating and changing them in the open light, is had by a door above same, preferably, but at other parts if desired, such as at the side, in addition to which a falling back to the sheath chamber may be provided in some cases.

Thus there is in a camera adapted to operate and fitted and constructed under this invention, a chamber at the back of the camera, a battery or a number of closed and normally locked metallic sheaths—that is, sheaths with hinged door or part adapted to make it light-tight when closed, and so constructed or provided with means that the said door remains locked, latched, or equivalently held when closed, so that the door will not fall open of itself, but be readily opened and closed from outside the camera by a suitable mechanism adapted to press it forwards or backwards against the retentive action of its construction for or means of locking or keeping it closed—which sheaths are arranged one behind the other in vertical planes, normally at right angles to the axis of the lens in said chamber; a door or doors in the camera—preferably above or at one side of the camera—through which access is had to the sheaths in the open daylight for manipulating them or placing them in position, and without any "dark" hindrances; and a device by which the foremost sheath door of the battery can be pressed open from an actuating device from without the camera, the mode of operating the sheaths being by opening said sheath-chamber door, and taking the foremost sheath after exposure from the front and placing it, preferably, at the rear of the battery, by which action the space within the chamber is kept filled, and the feeding of the successive sheaths up to the front for exposure of the sensitive plate or other media thereof is effected.

By such a construction or combination of photographic apparatus, and mode of operating same, is provided a hand camera containing a battery of sensitive plates, films, or other media capable of being manipulated with the camera open and in full daylight, and without "bags" or other "dark" arrangements.

NEW OR IMPROVED PROCESS AND APPARATUS FOR THE SIMULTANEOUS OR TENTATIVE EXPOSURE AND DEVELOPMENT OF PICTURES OBTAINED BY PHOTOGRAPHY.

No. 15,956. EDWIN HENRY HARDY, Manor Grange, Intake-road, Sheffield, Yorkshire.—*August* 26, 1893.

MY present invention relates to a process and apparatus for the production of photographic pictures upon sensitised films, paper, opals, or material. The process hitherto employed consists of placing a negative or positive transparency to a light, so that the picture of the same is transferred through a suitable lens, situated in a room protected from actinic light, on to a sensitised opal, film, or paper, which is fixed to a screen, board, or easel in said room. The picture by these means being either the same size as, or larger or smaller than, the said transparent positive or negative. In the ordinary process the amount of time given for exposure is guessed, and then the sensitised paper, film, or opal is removed from the screen, board, or easel for development, and, should the exposure be found insufficient, it cannot be again exposed, so that by this said ordinary process a large number of pictures are wasted or spoiled. With my present improved process and apparatus the picture from the transparent positive or negative, thrown by the lens on to the sensitised paper, film, or material, may be developed simultaneously with the exposure, by which means the exact amount of exposure required can be ascertained, and the sensitised film, paper, opal, or material is not removed from the easel, board, or screen for development. Or the picture may be exposed as many times as required; that is to say, an exposure may be made and the cap placed on the lens, when the developer may be applied without removing the sensitised material; and, should it be found that more exposure was required, the cap of the lens could be again removed and the picture again exposed; subsequent to replacing the cap the developer can be again applied, and this process can be repeated until a satisfactory picture is obtained.

In carrying out my present invention I employ the following improved apparatus:—I construct a frame of wood, metal, or other suitable material, in the centre part of which I secure a plate of glass, earthenware, or other suitable substance, perfectly plane on its surface. The said frame is made with a projecting part or flange along each side and top, and its lower end is in the form of a trough or receptacle, the bottom of which inclines preferably from one end to the other, the lower end thereof being arranged with an opening for the reception of a cork or tap.

The upper part of said frame has hooks, or other suitable devices, for securing or hanging it to the wall, board, easel, or screen. Where preferred, the said frame and plate may be made in one, and of glass, metal, or earthenware, or of other material, as will be well understood. The said plate and frame, after being secured in position to the wall, board, screen, easel, or other support employed, has attached to it the sensitised paper, film, opal, plate, or other material, in a position to receive the picture from the lens.

The developer or developing solution is placed in the trough formed at the bottom of frame, and is applied to the sensitised material preferably by means of a flat wide camel's-hair brush, Blanchard brush, spray-producer, or small hose.

Where the plate within the frame is transparent, the sensitised material may be placed at the back, or the frame may be turned round, and the picture thrown on the back of the plate, in which arrangement it will be obvious that the developing may the more easily be produced with the simultaneous exposure of the picture. After the picture has been developed, the frame and plate may be removed, and the apparatus can then be employed as a washing and fixing bath.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
19	Camera Club	Testing Slides in the Studio.
19	Glasgow & West of Scotland Am.	
19	Leeds Photo. Society	Social Evening. President's Address and Prize Slides.
19	North Middlesex	Lantern-slide Criticism.
19	Richmond	
19	South London	
20	Birmingham Photo. Society	
20	Brixton and Clapham	*The Collodio-bromide Process.* F. Goldby.
20	Derby	
20	Exeter	
20	Hackney	*Photo-micrography.* Charles H. Oakden.
20	Hastings and St. Leonards	
20	Keighley and District	
20	North London	
20	Paisley	
20	West London	Technical Meeting. Lantern.
21	Brechin	
21	Bury	
21	Croydon Camera Club	Annual Meeting. Special Display of Figure Photography.
21	Leytonstone	*Photography in a Nutshell and How to Crack it.* Tom Symmons.
21	Manchester Camera Club	
21	Photographic Club	*Stereoscopic Photography.* Thomas [Bedding.
21	Southport	
21	Southsea	
22	Camera Club	*Hyper Instantaneous Photography.* Capt. W. de W. Abney, C.B., R.E., F.R.S.
22	Ealing	*Enlarging.*
22	Glossop Dale	
22	Halifax Photo. Club	
22	Hull	
22	Ireland	
22	Liverpool Amateur	
22	London and Provincial	
22	Oldham	
22	Putney	*Home Sensitised Paper.* G. Ardaseer.
22	Tooting	*Paget Print-out Lantern Plates.* S. H. Fry.
23	Cardiff	
23	Central Photographic Club	*The Beginning of Artistic Photography.* A. H. Wall.
23	Croydon Microscopical	
23	Holborn	
23	Maidstone	
23	Swansea	
24	Hull	
24	Leytonstone	Lantern Evening.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

FEBRUARY 13.—Annual General Meeting, the President (Captain W. de W. Abney, F.R.S.) in the chair.

Messrs. H. M. Heywood and F. T. Carter were elected members.

The PRESIDENT read a letter from Mr. James Glaisher, past President, saying he was sorry he was not able to attend the meetings of the Society, He was glad to see it prospering, and he wished prosperity to the members.

The HON. SECRETARY having read the Annual Report,

Mr. W. S. BIRD moved its adoption. Referring to the Exhibition, he was glad to hear that it was a success. They were aware that a second Exhibition was held at the same time, but he believed that this concurrence would benefit both, and would not be an injury to either. He advocated more recognition of purely technical photographs at the Exhibition, and suggested that the Society should cultivate the professional photographer a little more. There were four or five thousand professional photographers in the country, of which the Society only had sixty as members. He concluded by recommending the examination of young photographers by the Society.

Mr. T. SAMUELS seconded, and remarked that a class of judges for the mechanical side of photography was needed in the apparatus section of the Exhibition. The museum (to which reference had been made) would be particularly useful.

The report was unanimously adopted.

The election of officers resulted as follows:—*President:* Sir. H. Trueman Wood, M.A.—*Vice-Presidents:* Captain W. de W. Abney, Messrs. T. R. Dallmeyer, Andrew Pringle, and J. Spiller.—*Council:* Messrs. Thomas Bedding, J. Cadett, A. Cowan, T. Sebastian Davis, W. E. Debenham, W. England, T. E. Freshwater, Colonel J. Gale, Messrs. T. C. Hepworth, F. Hollyer, Dr. Lindsay Johnson, Messrs. Chapman Jones. H. A. Lawrance, A. Mackie, J. W. Swan, J. Traill Taylor, E. J. Wall, L. Warnerke, H. Wilmer.—*Treasurer:* Mr. G. Scamell.

Votes of thanks to the various officers were passed and acknowledged.

Captain ABNEY (the retiring President), in acknowledging a specially hearty vote of thanks for his services, said that last year there were peculiar circumstances which prevented him refusing nomination; he wished to show that certain innuendoes had no foundation in fact. Since then the Society had lived down a great deal of the bitterness that was felt outside. He hoped that they would yet have the countenance of the disaffected, and that they would once more be honoured and valued members of the Society. He concluded by thanking the Council and members for their loyal support of the chair during his year of office.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 8,—Mr. Lewis Medland in the chair.

Mr. Hodd showed a hand camera of foreign make, holding twelve quarter-plates in sheaths, the focussing for varying distance of object being done by the insertion between the ordinary lenses of shallow convex lenses, these being arranged on a wheel like rotating stops, with an index outside marked with the corresponding distances.

Mr. GALWAY (a visitor) explained a modification of the blow-through jet, by which he claimed twenty per cent. more light. He cut off the usual sloping end of hydrogen tube, and screwed a cap over it with a contracted opening, to partly mix the gases before ignition.

Mr. PARFITT said that this was not new.

It being a Lantern Night, about one hundred slides, being those of the *Amateur Photographer* Prize Competition, were shown per favour of the Editor; also slides by Messrs. Austin, Bayston, Bartlett, Honeybourne, and L. Medland.

PHOTOGRAPHIC CLUB.

FEBRUARY 7,—Mr. J. W. Zaehnsdorf in the chair.

Three new members were elected.

Mr. G. W. TOTTEM stated that he had tried to bind lantern slides with tape, but had not succeeded well.

Mr. F. A. BRIDGE advised common glazed lining for the purpose, and the CHAIRMAN recommended the use of Stickphast paste.

A letter was read from Mr. S. H. Fry, stating that the Paget Company were about to introduce a machine-coated collodio-chloride paper.

On the proposition of Mr. THOMAS BEDDING, a vote of thanks was passed to Mr. Bridge for organizing and directing the Annual Entertainment of the Club held on January 31.

INTENSIFYING, REDUCING, AND FIXING.

Mr. H. WILMER said he tried to get more intensity than was required, and then reduced, using Farmer's reducer. In employing the latter he first immersed the plate in the hypo and then added the ferridcyanide.

Mr. J. WEIR BROWN said that Farmer's reducer did not act equally, as with full exposure and development he thought it cleared up the negative, while with less than the correct exposure it gave hardness.

Mr. WILMER said that the action of ferridcyanide and hypo mixed was to clear out the high lights. He thought Farmer's reducer was useful for clearing the glass and leaving the lines black in lantern slides.

Mr. W. H. BARNES said that a mixture of acid and alum was sufficient for reducing pyro-developed negatives, but Farmer's reducer was necessary for those developed with hydroquinone.

Mr. WEIR BROWN found that Farmer's reducer sometimes left a yellow stain which would not wash out.

Mr. R. CHILD BAYLEY said that a strong hypo bath would remove it.

The CHAIRMAN said that he had a negative which had been used for process work, that had been returned to him with a deep ruby stain round the edges. He asked the best means for removing the stain.

Thiocarbamide was recommended as a remedy.

Mr. E. W. PARFITT had had a similar experience with a negative intensified with bichloride of mercury.

Mr. J. NESBIT asked how to tell when a bromide print was fixed?

Mr. BRIDGE examined the prints for yellow colour by transmitted light. He had used bromide paper that was three years old and had got a pink colour on it.

Mr. J. A. SINCLAIR found that negatives left long in the acid bath were reduced.

Mr. F. HAES advised the use of a second fixing bath to get thorough fixation.

Brixton and Clapham Camera Club.—February 6, Mr. W. H. Harrison in the chair.—A demonstration was given by the Autocopyist Company, of London Wall, E.C. Several specimens of work done by means of the photo-autocopyist were exhibited, and justly earned the very favourable remarks made by members of the Club. The copies of the prints struck off during the course of the evening were in great demand. There was nothing about any of these prints to indicate that they had been produced by means of a gelatine process, but they appeared to be identical with those which are daily produced by other lithographic processes. A short description of the process, which is remarkably cheap and simple, is as follows:—A sheet of vegetable parchment, covered with a layer of gelatine, is cut to the size of the printing frame, and sensitised in a weak solution of bichromate of potash, the strength of the bath varying from two per cent. in summer to three per cent. in winter, according to the temperature. To the bath a few drops of ammonia should be previously added. The sheet is allowed to remain in the bath for three minutes, until it is turned a bright yellow. It is then removed, squeegeed down to glass, and dried in the dark. The time of drying varies, but the demonstrators recommend the sensitising over night, so that the film will be ready for use next morning, when it is stripped from the glass and exposed in an ordinary frame behind the negative. Printing takes some little time, as the film is not very sensitive. The action of light renders the film hard and insoluble beneath the clear portions of the negative, and turns the film to a brown colour, hence printing is not a difficult matter. When all detail is out, the film is reversed, so that the light may harden the back of it. It is then soaked in water for two hours. The bichromate is washed out of the portions unacted on, which swell and give an embossed appearance to the film, the parts acted on being sunk into the gelatine. The film is then softened with a solution of water, gelatine, and ammonia, which is poured off, and the film dried with a cloth. Inking takes place with ordinary lithographic ink by means of rollers, a stiff ink being used for the dark shadows, and a thin ink for the light half-tones, &c. Any colour, or mixture of colours, may be used by varying the tint of the ink, which only adheres to the portions affected by the light. After inking, a sheet of paper is laid on the film, and inserted in an ordinary copying press. Pressure is applied in the ordinary manner, and the process repeated *ad lib.* The price of the apparatus is exceedingly moderate, being only 3*l.* for half-plate, which may be recommended to photographic societies for circulating copies of medalled pictures, &c.

Central Photographic Club.—February 9.—A crowded audience attended at the Club Rooms to witness a demonstration of the *Carbon Process* by Mr. Birt Acres, assisted by Mr. Skelton. The chair was taken by Mr. Thomas Bedding. After briefly describing the process, the working of the single-transfer method was shown. It was recommended to those who were taking up the carbon process that they should purchase their tissue at first ready sensitised, and commence with the single transfer. Before printing it was necessary to place a safe edge on the glass side of the negative. The reason for this was explained by diagrams. As no image was visible during printing, a Johnson actinometer was used to ascertain when sufficient exposure had been made. Damp weather caused a continuing action of light to go until development, and advantage could be taken of this fact by partially printing and allowing the continuing action to go on for a sufficient period before development. This action would not go on if the printed tissue were placed in a calcium tube, but the tissue so kept would have to be exposed to the atmosphere in order to absorb some moisture before it could be developed. After the tissue had been placed on its support and developed in water at a temperature of 100° Fahr., it was placed in an alum bath and afterwards washed. It was a mistake to slur washing in this as in any other process. The double-transfer process was explained and demonstrated, and also the reproduction of negatives for enlargements, lantern slides, and transparencies. Comparisons were made as to the difference in character of negatives for enlargements and lantern slides. During the whole of the demonstration Mr. Acres had to stand a running fire of questions and criticisms, one gentleman being very prominent in this way, who was understood to be *au fait* at working the process. Mr. J. H. Taylor exhibited and explained the working of a portable electric lamp for use in developing. It was extremely light and portable, weighing only two pounds, and consisted of an accumulator in a waterproof case, a wire stand, and a lamp with a reflector, and gave either a ruby or orange light as desired. It was also provided with a clip to fit into the button-hole.

Hackney Photographic Society.—February 6, Mr. E. Puttock in the chair.—Two new members were elected. The Hon. Secretary showed sundry photographic requisites, among which were the improved form of the "infallible exposure meter" and Fitch's developing dish for films. Mr. Hudson showed some cheap double dark slides. Mr. SNOWDEN WARD was then called upon, and gave a most entertaining lantern lecture entitled, *A Trip to the World's Fair and Back.* Some very fine slides were shown on the screen, among which were some good sunset views taken during Mr. Ward's passage across the Atlantic. The lecturer's remarks were very interesting, and, on concluding, Mr. Ward advised every one who had time and opportunity to take a holiday trip to the States. Members' work in lantern slides was then shown by Messrs. Roder, T. H. Smith, Guest, Roberts, A. Barker, Wilks, Cross, Carpenter, and Selfe.

Leytonstone Camera Club.—February 7, Mr. Tom Symmons in the chair.—Mr. S. HERBERT FRY gave a lecture and demonstration on the various Printing Papers of the Paget Prize Plate Company, including their new collodio-chloride paper. He contrasted the different qualities of the matt and the gloss, the

advantages on mostly all points resting with the former. There had been many arguments against the permanency of the gelatino-chloride papers, but he considered that faults in this direction were more traceable to the worker than the process, insufficient washing being often the cause. He thought the new matt paper had a great claim as to permanency, owing to the very small quantity of gelatine used in the coating. He advocated the use of a five per cent. carbonate of soda bath between the printing and toning, after the ordinary washing, for about five or ten minutes, and that in all operations the print should be face down when in the baths, thus securing the deposit, if any, going to the bottom, instead of resting on the face of the print, a too frequent cause of uneven toning. Some of the other advantages of the new matt paper were that there was no deterioration of the whites, there was a much longer range of tone, &c. Referring to the new collodio-chloride paper, they were the very first Society to hear anything about it. He had been told at Watford that day the great tip in the use of it was to well soak the paper, as it came from the printing frame, in hot water, as hot as the hand would bear, by which means the paper would keep flat, and the after-manipulations would go on smoothly. A large number of prints had been passed round in pairs, showing, by comparison, the relative qualities of the matt and ordinary surface, although, by seeing both together, the weak points of each are seen and neither appreciated, as would be the case if only one was viewed. The development of some matt paper was next proceeded with, and proved to be a power in the hands of the photographer, as a good print could be secured on a dull day, when it would be impossible to secure a fully printed positive, and by means of development a good print was often to be obtained from a flat negative, and contrasts increased or decreased at the operator's will. Mr. GOLLEDGE asked whether a satisfactory mountant had been discovered for enamel prints? He had experimented in almost every direction, but could find nothing more satisfactory than indiarubber dissolved in benzole. The lecturer knew of nothing more satisfactory.

Putney Photographic Society.—February 5, Mr. F. Gorin in the chair.—Mr. THOMAS BEDDING read a paper on *Stereoscopic Photography*. He commenced by saying that he proposed to deal with the subject in a popular and practical manner, to encourage beginners to take up this charming and interesting branch of photography, rather than to address those who might already be acquainted with it. He then briefly explained the principle of binocular vision, how the two eyes saw two dissimilar pictures, which, merged into one, gave the effect of solidity, relief, and distance. The two lenses of the stereoscopic camera were placed at approximately the same distance apart as the eyes, and two dissimilar negatives were therefore obtained; positives taken from them would, when viewed in the stereoscope, merge into the picture, and give a realistic effect of solidity and distance quite unobtainable in the single photograph. Stereoscopic negatives might be taken in a camera fitted with one lens only, by taking first one negative, and then slide the camera sideways a few inches and take the other. It was obvious that this could only be successfully done when the subject was perfectly still for some little time, and that the application was therefore limited. It was not an expensive matter to arrange an ordinary parallel bellows half-plate camera for stereoscopic work, and the twin lens arrangement would be found far more satisfactory in its results, and more convenient in use. The camera must have a front wide enough to mount two lenses side by side at about three inches between centres; it was also necessary to have a central longitudinal partition in the camera, dividing the body in two parts; such partitions could be bought for a couple of shillings, and could be fitted so as to be readily removable when the camera was wanted for single views. For all subjects, except architecture and very quick snap-shots, single landscape lenses were quite sufficient; they were comparatively cheap, very fair ones being procurable at a small cost. He thought a focus of about five inches would, perhaps, be most generally useful. Flat subjects and panoramic views would be found disappointing; the picture should preferably consist of several planes, with rather more foreground than would be thought advisable in a single view. A full exposure was desirable, and in developing it should be borne in mind that a soft negative full of detail was the best; one suitable for single views would generally be too hard, and would show an unpleasant "snowy" effect when viewed in the stereoscope. When a print, taken direct from a stereoscopic negative, was placed in the stereoscope, it would be found that, instead of giving a stereoscopic effect, quite the opposite would be seen. On reflection it would be noted that the right-hand half of the print was taken from the part of the negative taken with the left-hand lens, and *vice versâ*. The remedy is to cut the print along the partition line between the two halves, and reverse their position—*i.e.*, mounting the right-hand part to the left on the mount, and the left-hand part on the right. The two parts should be so trimmed that, when they are reversed and placed side by side, the distance between similar objects in both should be about two and three quarter inches, which corresponded with the average distance apart of the eyes. If the distance exceeds this, difficulty may be experienced in getting the two parts to merge, and the eyes will be unpleasantly strained; on no account should the distance exceed three inches, but may without disadvantage be reduced to two and a half inches. It adds to the effect if a space of at least a sixteenth of an inch is left between the two parts of the picture. The height should be arranged to suit the subject, and may be anything up to about four and a half inches. It is of the utmost importance that the two plates should be trimmed, so that the same objects in both are the same distance above the base line, and that vertical lines in both should be parallel and perpendicular with the base line. It also adds to the stereoscopic effect if the right-hand half shows a little more of the subject to the left than the other, the left showing more on the right. Mr. Bedding had brought slides, which were passed round to illustrate his remarks, and, when viewed in the stereoscope, they clearly showed what should be aimed at and what avoided. He also described the method of making transparencies by contact printing and in the camera, which latter he personally preferred on account of its simplicity. As in the case of prints, softness and detail were more desirable than the "sparkle" aimed at in lantern slides. He then alluded to the various forms of stereoscope, and recommended the use of good achromatic lenses, mounted so that they could be adjusted transversely to suit different distances apart of eyes, and vertically to allow of being placed opposite the centre of pictures of different heights. A convenient method of focussing and good eyeshades should be provided. The interesting lecture was listened to with attention, and was followed by a discussion. A hearty vote of thanks brought the proceedings to a close.

South London Photographic Association.—February 5, the President, Mr. F. W. Edwards, in the chair.—It was arranged to have a competition of slides made on Cadett lantern plates, samples of which were distributed. A communication from Mr. A. R. Dresser on *Enlarging Hand-camera Negatives*, illustrated by specimens, was then read. "For enlarging, a good lens must be used, or the results will not be good, but of course the hand-camera negatives must be produced by a good camera and lens. There is no better way of enlarging than by doing so direct on bromide paper, as it is easy, sure, and not expensive, and good results can be got after a little practice and patience. The colour is, as a rule, a good black, but warm tones, from brown to red, can be got by uranium toning. The specimens sent had been developed with amidol and eikonogen. For the last year I have used nothing but amidol for bromide paper, and like it well. Rough bromide paper gives more artistic results for 12×10 and over. Daylight is the best light for enlarging, if one has the time during the day, and is able to get a north or west light—one certainly gets better results with it than by artificial light. It is necessary in working this way to have a camera the full size of the enlargement, which is expensive. For amateurs, enlarging by artificial light is the best way. One great point in its favour is that the work can be done in the evening. In working by artificial light, an enlarging lantern with five and a half inch condenser at least for quarter-plates will be required; any make will do, that suits the person using it. A good lens is a *sine quâ non;* the one I use is a portrait lens of seven-inch focus, with which I can enlarge to 15×12 without stopping down, if I wish. It works at *f*-4, but as a rule I work it at *f*-6, unless the negative is very thin, when I stop down until I get the strength of light I want. When you have a lens that covers perfectly to the edges of the plate, there is no advantage in stopping down, except to reduce the quantity of light. Most people use a board, to which they pin their bromide paper when enlarging, but I use a dark slide for all sizes up to 15×12, as it has so many advantages. The dark slide is fitted on a stand, so that it can be moved vertically or horizontally in composing the picture. In double printing the shutter is closed while the negatives are changed. The lights used in working by artificial light are, (1) oil, (2) limelight, (3) house-gas (incandescent gas-burners). Oil I pass by, on account of the bother and smell, and, besides, it gives a very yellow light. Limelight is all that can be desired, so far as the light goes, but it is very costly, and the heat melts negatives made on Eastman films. I now use two incandescent gas-burners. The mantles are far from perfect, but the light given is the best to use, being nearly as good as limelight, and much cheaper and convenient. When one wants to make an enlargement, a match is applied to the gas, and all is ready; when it is done, the light is turned out, but then it is ready when it is next required. I have treated on this method of enlarging in an article in one of the annuals for the present year. For developing with eikonogen, my formula is—Eikonogen, 1 ounce; sulphite of soda, 4 ounces; carbonate of potash, 1 ounce; washing soda, 1½ ounces; mix with boiling water to make 30 ounces. I use this full strength, using one quantity five times. The formula for amidol which I prefer is, (1) a saturated solution of sulphite of soda, (2) a 10 per cent. solution of bromide. For use, take 10 ounces of the soda solution, 1½ drachms of bromide solution, and add 60 grains of dry amidol. This I use for six prints running. The mixed solution will keep for about fifteen days in a stoppered bottle."

Tooting Camera Club.—February 8, Ladies' Night.—Mr. J. L. LYELL, of the West Surrey Photographic Society, exhibited a large number of slides, illustrative of Indian architecture, life, &c., and personally explained them. Slides were also shown by Messrs. Ellis, Simmonds, and Beckett (members). The lantern was lent and operated by Mr. A. H. Anderson (President).

Woolwich Photographic Society.—February 8, Mr. W. H. Dawson in the chair.—Three new members were elected. Mr. S. HERBERT FRY addressed the meeting on several matters relating to *Paget Printing-out Papers*, more particularly to the development of partly exposed prints. First taking up a question which had been asked earlier in the evening, the lecturer stated he believed in the combined toning and fixing bath, and preferred one containing chalk instead of the sulphocyanide. The toning bath recommended is made up as follows:—Stock solution, hypo, 1 pound; nitrate of lead, 1 ounce; chalk, 1 ounce; water, 80 ounces. For warm tones, add 1 grain of chloride of gold to 10 ounces of stock solution. For cold tones, use 1 grain of chloride of gold to 5 ounces of the above. Use this bath only once, and shake up before using. After touching upon the new matt paper and the collodio-chloride paper just placed on the market, Mr. Fry proceeded to show the advantages of being able to bring up under-exposed gelatino-chloride prints to the necessary printing density for toning by partial development. There is a saving of time, important in dull weather, and such a treatment gives the power to weaken or strengthen the contrasts of the image by varying the proportions of the developer. It is important to thoroughly soak the prints in the bromide solution, and that development should be stopped just before the fine detail of the picture is seen, or the print, on being toned, would be too dark. Washing should be quickly done for the same reason, and it should be thorough, or the print would refuse to tone. Mr. Fry developed and toned several under-exposed prints, which were then indistinguishable from prints fully exposed in the ordinary way.

Fairfield Camera Club.—February 9, Mr. T. E. C. Wilson in the chair.—Messrs. A. Wright, W. H. M. Andrews, J. H. Goudie, and J. W. Turcan were elected members. The annual competition medals were presented to the winners, Messrs. H. Forrest, S. H. I. Smith, J. Towers, and F. H. Elsby. The PRESIDENT then gave the lecture prepared by the California Camera Club on the *Yosemite Valley*, the slides of which exhibited to advantage the enormous trees and mountains of this wild district.

Leicester and Leicestershire Photographic Society.—February 8, the President (Mr. J. Porritt) in the chair.—Eight members were balloted for and elected, and two proposed. Mr. A Squire was elected Vice-President of the

Society; and on the motion of Mr. J. T. Cook, seconded by Mr. Hubbard, it was decided to engage the Co-operative Hall for the Society's next meeting, in order that the members may be enabled to invite their friends to a lecture by Mr. Keene, of Derby, on *Derbyshire Past and Present*, when an intellectual treat is expected. After the business, the slides lent by the editor of *Tit-Bits* were passed through the lantern, illustrative of *How Popular Journals are Produced*, and, taken with the connective reading, were interesting and instructive.

Rotherham Photographic Society.—February 6, Dr. F. B. J. Baldwin (President) in the chair.—The prizes gained in the recent competition for members' work were distributed. One honorary member was elected. The annual exhibition was fixed to take place on Tuesday and Wednesday, April 3 and 4. The subject of *Developing and Developers* led to an interesting demonstration, plates being developed by the following members:—Ferrous-oxalate, the President; pyro-soda, Mr. J. Leadbeater; pyro-ammonia, the Hon. Secretary; eikonogen and hydroquinone, Mr. E. Isle Hubbard; hydroquinone, Mr. J. W. Whittington; and amidol, Mr. W. H. Shephard.

Sheffield Photographic Society.—February 7, Mr. Ernest Beck in the chair. The President presented the several medals to the winners in the annual competitions. A proposition was brought forward, and accepted, that presentation albums be sent to the various charitable institutions in the city, for which a sum of money was voted by the members, and a committee appointed to carry the same into effect. A practical demonstration was given by Mr. T. G. Hibbert, subject, *Ilford Matt Printing-out Paper*, which was illustrated by a choice collection by Mr. Hibbert and the Ilford Company.

Amateur Photographic Society of Madras.—The following gentlemen have been elected office bearers for the ensuing year:—*President:* Mr. C. Michie Smith, B.Sc., F.R.S.E.—*Vice-Presidents:* Mr. C. Slater and Surgeon Lieutenant-Colonel S. L. Dobie.—*Committee:* Messrs. F. Dunsterville, W. M. Gerrard, V. G. Lynn, A. L. H. Palmer, J. L. Walker, and Captain A. D. G. Shelley.—*Hon. Secretary and Treasurer:* Surgeon Major J. L. Van Geyzel.

FORTHCOMING EXHIBITIONS.

1894.	
February–March.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
March 26–28	*Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.
April 13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

GAS CYLINDERS.

To the EDITOR.

SIR,—Mr. Kenneth Murray has certainly succeeded in reassuring the users of compressed gas cylinders to a great extent by restoring some confidence in their safety, so much disturbed by the recent accident at Bradford. My humble opinion, worthless as it may be, still remains that many lanternists, as well as their audiences, would be better pleased at a lower pressure than now generally adopted. It was so some years ago. My then oxygen cylinder, supplied by one of the leading firms, went to and from the stream (I should say, the pump) very many times, until, one day falling into the merciless hands of Messrs. Brin's skilled but exacting engineer, its existence was brought to a sudden termination. How many the pieces were, or how extensive the cracks, I know not, for I only received back for consolation its wooden shroud (now, I see, demanded by all the railway companies), in which it had travelled many hundreds of miles to assist in enlightening the village folk with its mild yet contented stomach pressure.

Accepting the situation, I have become reconciled to its less weighty successor, and doubtless Messrs. Brin have ever since considered me indebted to their prudence for my continued existence, useless probably as a lanternist, owing to the superabundance of these professors now on the tapis. It may be so, but will Mr. Murray still further assist us by lubricating (*sans* oil) the at present *pas bien doucement* action of the cylinder tap, which can by no means be considered perfect, notwithstanding the elasticity afforded by the Beard or other regulator.

It is stated in the *Scientific American* that Professor Arnold has succeeded in producing pure iron (99·81) by means of aluminum (*sic*), with a limit of elasticity of eighteen tons per square inch, and a breaking load of twenty-three tons. These figures, however, are below those given by Mr. Murray in your issue of January 26. As to the ultimate strength of cylinders as now welded, or drawn and annealed, I must conclude by still hoping that perfect safety will be ultimately attained, even if with extra weight (notwithstanding the present tendency of the age for extremes).

A small twelve-foot cylinder cannot harmoniously be carried or concealed at the bottom of our wives' dress baskets—neither their sweet tempers nor their lovely garments will be improved thereby; let our metallic babies, therefore, travel boldly in passenger van or by goods, rejoicing in their bulk, their weight, and their strength.—I am, yours, &c.,

47, *Sussex-square, Brighton,* SLINGSBY BETHEL,
February 7, 1894. *President of the Lantern Society.*

THE INCANDESCENT GASLIGHT.

To the EDITOR.

SIR,—I was very much interested in your article on the incandescent gaslight, and, as I may probably be among the first in using it for portraiture, a word may not be out of place to those who may have no opportunity of testing its quality before going to considerable expense in having it laid on. I may say at once it answers well. I think about eight lamps (properly arranged, of course) would be sufficient for all ordinary work, although I have not so many. I think it is a very good addition to country studios, where it is impossible to have electric light unless possessing a very long purse, which, I am sorry to say, I don't think very many of us have. The light is also invaluable for copying and enlarging.—I am, yours, &c., W. THORNEYCROFT.

Newport Pagnell.

PHOTOGRAPHING IN ITALY.

To the EDITOR.

SIR,—Your correspondent, Mr. Ferguson, has not quite got the hang of things photographic in Italy. You may photograph freely anything which is exposed to the public outside of enclosures, and with hand cameras you may go into enclosed monuments, like the Roman Forum, without permission; but, for large cameras and tripods, one must have the permission of the Ministry of Public Instruction, which is got at the local office of supervision of the monuments by written application on a sheet of stamped paper, costing sixty centimes. Sundays and great holidays it is not permitted, even to those having tickets, without a special endorsement from the head of the office. There is no difficulty about getting the ticket of permission, passport or not, but one ought to know the ropes and a little Italian. To photograph in the churches, ask permission from the head of the chapter. The beadle will inform you who he is. Begging Mr. Ferguson's pardon, the principal dealer in all photographic materials in Rome is Sbisa, 149, Corso, agent for Eastman, and of whom most English material may be got. The Amateurs' Club, Piazza di Pietra (not Pietro, as it was once printed) is always open open to members of foreign clubs on showing their tickets of membership, and there all the conveniences of development with the ordinary material are to be had, the latter at tariff prices, as for members. An artist, or archæologist, or professor of any school of art or science, who will demand, with the certificate of the consul, or of his institution, a general certificate from the Ministry, gets a white ticket for a year, which he has only to present to the local office anywhere in the kingdom to get the local ticket, which includes admission to the collections and the right to photograph them without other formalities.—I am, yours, &c.,

Rome, February 11, 1894. W. J. STILLMAN.

"THE NEW ENGLISH."

To the EDITOR.

SIR,—Mr. Crossle would make sad havoc of the English language if his objection to the termination "er," as being a mongrel addition, were given full effect to. Webster, to whom he has referred, describes it as the Teutonic form of the Latin "or." Now, although he does not give the word "photographer" in any edition of his dictionary that I have seen, yet the following words of same derivation are spelt by him with the *obnoxious* "er":—"biographer," "bibliographer," "geographer," "historiographer," "hydrographer," "typographer," "topographer," and some others.

Although Mr. Crossle has a poor opinion of the necessity of having an authority to appeal to on disputed points in connexion with language, his views in this respect are not shared by those really acquainted with the work of *extension* and *purification* carried on in France, Germany, and Italy by experts specially entrusted with such objects.—I am, yours, &c., PHOTOGRAPHER.

February 12, 1894.

EXPOSING DEVELOPED PLATES.

To the EDITOR.

SIR,—A correspondent last week heads a letter "Exposing Spoilt Plates," which may have been quite likely in his case but not in mine. As I have had a somewhat similar experience, I think I may as well reply to the communication. I had two plates in a dark slide, one of which I had exposed some time previously, but, having made no note at the time,

took out the unexposed one and developed it; but, knowing that one was unexposed, I developed very carefully. Finding no image coming, up I rinsed it well, and then placed it on a metal plate, and dried it on the top of my dark-room lantern. The only defect I noticed was it had dried unevenly—the middle portion of the film, where it was exposed to most heat, was slightly raised. I placed it in my dark slide, and gave it what I thought a proper exposure, and got a decent negative.

I notice, however, that your correspondent only washed his plate slightly, and exposed it to stray light. Therefore, with an exposure of ten seconds with *f*-16, sun shining brightly, at one o'clock, on what I assume to be an outdoor view, I should think a rapid blackening would take place, even had no stray light got to the plate. I cannot see what we have to learn from your correspondent's "very carefully conducted experiments."—I am, yours, &c., S. E. Kelf.

Reading, February 13, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

For exchange, two good strong head-rests; wanted, two deep 19×15 granitine dishes, "Limpet" focusser, Hetherington's *Studies from Leading Photographers*, The British Journal Photographic Almanac, 1894, &c.—Address, D. Butt, Bank-street, Carlisle.

Will exchange good hand camera, with three double slides, time and instantaneous shutter, first-class single lens, working at *f*-6 for instantaneous work, and *f*-30 for time, perfect, for quarter-plate tripod camera set.—Address, P. C. Frewin, 2, Clarendon-villas, Hythe-road, Ashford, Kent.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

*** Several correspondents in our next.

Received.—*The Secondary Colour Aberrations of the Refracting Telescope in Relation to Vision.* By H. Dennis Taylor.

C. J. Emeny.—Any good rapid lens will answer.

W. Kingsland.—We have told your friend all that we know on the subject.

H. T. B. asks where he can get a studio on wheels to buy second-hand.—We do not know.

W. P.—The invention, under the name of Richmond or scroll drawings, was patented in 1864.

F. M.—Your lens will answer quite well for a hand camera, although the focus is rather longer than some prefer.

Henry Johnson.—A quick-acting Petzval portrait combination will be best for children's portraits in a studio.

B. B.—Both samples of pyroxyline appear suitable. Better dissolve in ether and alcohol, and see if the collodion answers.

A. Platen, Melbourne, and others.—The address of the makers of mezzotype paper is the Carlotype Company, Rainham, Essex.

E. G. Richardson.—Put the positive in your pocket and call in with it some day, and then we will be better able to give advice.

Sulphurton.—What precious metals there may be left in the combined toning and fixing bath may be precipitated with sulphide of potassium.

A. M. Z. says: "Would you tell me what is the life of a well-made bromide print (as far as it is known)?"—We have some made seven or eight years ago which are now in a perfect state of preservation. There is no reason why a properly made bromide print should not be as permanent as any other kind of print.

J. Crawford.—It would seem that some of the gold had precipitated, probably from the use of impure water. Use distilled water next time.

Rapid.—We do not quite apprehend your meaning. If the query refers to ascertaining the focus, this is done by measuring from the optical centre.

F. St. J. Gore.—So far as we are aware, no experiments to test the amount of washing required to eliminate hypo from gelatino-chloride prints have been published.

Slides asks: "Will you kindly supply me with the recipe of the cement used for lantern-slide binding?"—Nothing answers better than thick flour or starch paste.

Arthur Lingard.—For putting down photographs to be fired on enamelled tiles, adopt the dusting-on process, a formula for which will be found in any of our Almanacs for several years past.

Spots.—The spots are clearly due to something in the manipulations, but what, it is impossible to say unless we saw them carried out. They have all the appearance of being due to air bubbles in contact with the print while it was in the fixing solution.

Tadrous Hanna (Assiout).—The most useful lens for the purposes mentioned are those of the type known as rapid rectilinear. Many makers now construct them, and we do not think you will experience any difficulty in obtaining them in Cairo.

Ajax says: "Will you kindly inform me if you know where I could obtain either the matt for printing through, or cards to mount the 'Gem' or postage-stamp photographs on, so as to have a bordering like a real postage stamp? I saw a 'Gem' photograph a little while ago that had a margin the *facsimile* of a postage stamp, but cannot find out where to obtain what is requisite to get the result."—We have little doubt but that any of the large stock houses could supply what is necessary. Write to some of them and make inquiry.

A. S. Hoyles writes: "Would you, through the medium of your correspondence column, answer me the following questions:—1. What is the lowest price that I can get a small apparatus to do collotype work. 2. Also where can same be got. 3. Is there a similar ink process that I could work cheaper than collotype. 4. Can you give me the address of a firm *manufacturing* velvet studio posing chairs." In reply:—1. About 25*l.* to 30*l.* 2. Winston, Shoe-lane. 3. No; not for half-tone work. 4. They may be obtained from any of the large stock dealers.

Mag Ribb.—1. Will you kindly inform me what is the right quantity of magnesium ribbon to burn to obtain a good negative from a "wash" (not line) drawing in black and white, in which there are all the gradations from black to white? 2. Is there any work published giving details upon this special point, *i.e.*, copying wash drawing by magnesium ribbon?—1. All will depend upon the distance of the light from the picture, the aperture of the lens, and the sensitiveness of the plates used. A few trial experiments will supply the desired information. 2. No.

Enamel (Wolverhampton).—Would you kindly inform me if it is possible to prepare an enamelled-iron plate so that it will receive a photograph and withstand fire? The enamelled plates I refer to are those used as tradesmen's signs. If this is possible, what bath would you recommend as a sensitiser? My idea is to transfer a photograph on to enamelled goods, but it is essential that the image should be as fire-proof as the enamel itself.—Yes. A picture can be burnt into an enamelled-iron plate in the same way as is done with enamelled copper tablets. Either the substitution or the powder processes will answer. When the picture is burnt in, it will be as durable as the plate itself.

J. R. J. writes:—"Respecting Mr. Gear's article on 'Photogravure' in your last issue, may I ask where I can obtain the following? The copper plates, burnishing tool, roulette, Beaume's hydrometer, and the most suitable kind of powdered asphaltum. The latter seems of importance, hence my asking the name of dealer. I should like, also, to ask if any kind of box will serve as a dusting box, providing it is close-fitting in all its parts, and what quantity of powder should be used? Also give a little information as to the method of applying the etching fluid. Is it right to begin with the strongest solution and work on to the weakest, or *vice versâ*? how, too, is it applied? What are the signs that determine the completion of the etching? I shall be exceedingly obliged if you can assist me in these matters."—The three first are supplied by all dealers in printers' material. The hydrometer can be had from any chemical apparatus manufacturer, and the asphaltum most people powder for themselves in a mortar. Any kind of box may be extemporised, but it is better mounted on pivots, so that it can be turned on its axis. The quantity of powder in the box is not important. Begin with the strongest solution and finish with the weakest. Immerse the plate in the solution, which must be in a flat dish. The plate is judged by the detail that is seen. When the high lights are ready, the etching must be stopped.

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SUITABLE RETOUCHING SURFACES.

We have of late heard of so many complaints from what may be termed outside retouching establishments that they are supplied with negatives which cannot have justice done to them on account of their poor and uneven surfaces, that it may be useful to some of our readers to point out some desirable conditions in this direction. We are not about to write a disquisition upon retouching merely upon a point of practical photography not bearing on this work alone, as it also applies to other considerations. To be able to retouch to perfection, the surface to be worked upon must bear as close a resemblance to a piece of ivory prepared for painting upon as can possibly be produced. This is little more than stating that the surface must be perfectly even and quite free from inequalities. Further, a negative possessing such a surface is also best suited for many others—notably for enlarging from, for transparency-producing, and for the rendering of minute detail generally. The requirements are connected both with varnished and non-varnished surfaces, for, as is well known, some retouchers prefer to work on the film suitably prepared to receive pencil, while others choose to stipple or hatch upon the varnish. The latter, again, are divided; a varnish which will permit the application of retouching without the intervention of "medium" or abrading being the choice of some retouchers, while others, again, will have a hard varnish surface, to be afterwards prepared by either abrasion, or a thin coating of medium, to receive the pencilling. But, whichever mode is adopted, if delicate work is to be done, the surface must be even.

The advantage of working on the film direct is that there is greater probability of a suitable and even surface, seeing that whatever unevenness may be present upon it is generally intensified after varnishing; and, beyond this, the varnished surface may of itself possess unevenness. The disadvantage of this method is, that sometimes the retouching—the result, perhaps, of hours of labour—may be slightly or seriously disturbed during the after-varnishing. The counterbalancing gain is, however, very great. The same retouching, once protected by varnish, is secure from after-injury, no matter how many prints are required from the negative; and, if it be slightly stirred during the varnishing, a few after-touches will generally suffice to put it right.

When we come to a consideration of retouching done in the first instance upon a varnished film, the first advantage that strikes us is that, in case of alteration, it is easy to remove or alter any portion of the pencilling, while with film-retouching the power to remove it involves obtaining a print from an unvarnished plate, which is always to be deprecated in view of a possible setting off of the silver, and consequent injury of the negative. However, many workers prefer this plan, and the only remaining difficulty is the protection, by a second coat of varnish, of the work of the retoucher. Few, if any, mediums used for the purpose may be relied upon to a complete certainty that they will not cause the retouching either to float away altogether, or at least to move and blur in parts. Yet to leave the retouching unprotected means to stand the chance of finding it, after a number of prints have been taken, so specked and soiled as to need patching by the retoucher. This is generally the case if the negative be one that is put away and liable to be needed from time to time.

There is one very important, and little-noticed, peculiarity which varnished films are liable to that we may here draw attention to. When using a hard resistant varnish, if, in course of use and its having become too thick, it be thinned with spirit beyond a certain limit, it seems liable to become more resistant, and the usual treatment with medium fails to give a surface that will take the pencil properly.

After thus fully discussing the various modes of preparing the negative for the retoucher, we now return to the condition of its surface. The great and most common source of unevenness comes from copious working with unfiltered water. This, which sometimes may be unavoidable, should always be followed by a gentle cleansing of the surface by a pledget of wet cotton-wool, followed by a flush with clean water. It is remarkable how great with some waters is the amount of "grittiness" of surface the negative may exhibit.

Another cause that we do not remember having seen noted is in the use of the acid fixing bath. Sometimes, when this is used for the first time, a kind of deposit is produced upon the surface of the film which we have seen attain the dimensions of an absolute scum. Care, therefore, should always be taken, when so using the fixing bath, to note whether this appearance be present or not. It is, however, also removable by the cotton-wool, but it needs considerable friction.

The use of backed plates when a pigment is employed is very liable to cause a rough surface through deposit of pigment particles, unless the rag be well rubbed after washing, and the more is this probable, seeing that in the dark room this deposit might easily escape attention.

Finally we must speak of the varnishing. It is absolutely necessary, if a pure even surface is required, that the varnish should be continually filtered. The usual plan with careful

workers is to use one bottle to varnish from, and another provided with a filtering funnel to receive the overflow from the plate. By this means a limpid clear solution is always available for every negative. In conclusion, if we were to put our own view as to how the requirements as to a suitable retouching surface should be ensured, we would say, Cleanse and wash every negative after its washing in running water, retouch on a suitably prepared film, choosing, if possible, a medium that the varnish will not touch, and give a final varnish to protect the pencilling from future injury by abrasion or absorption of dusty or fluffy particles.

THE WET-COLLODION PROCESS.

XI.—Porous and Skinny Collodion and Combination Effects obtained from the Latter.

There are two main conditions in which collodion may exist, one in which it is so very tough and skinny as to be readily stripped from off the glass plate without tearing; the other in which it is spongy, porous, and "rotten" when spread.

Each of these conditions is valuable, according to the purpose for which it is to be utilised. The former of these would prove unsuitable for such a purpose as the formation of the primary film or substratum which is used in the collodio-albumen process as employed for negatives by Dr. Taupenot, or for stereoscopic transparencies by several other eminent Frenchmen. But of the more special and discriminative uses of skinny and porous collodion we shall take occasion to speak hereafter.

Some considerable time has elapsed since the discovery was made that, by immersing a sheet of blotting or unsized paper in sulphuric acid diluted with water, it becomes parchmentised. It is now an article of commerce, known as parchment paper, and is extensively used for covering pots of jam and other preserves. It also makes a good septum in dialysing or separating salines from colloidal substances. Any one is now at liberty to make it for himself, the patent, obtained by Gaine in 1857, having long since expired. In Gaine's process it was recommended to plunge unsized paper for a few seconds into sulphuric acid, diluted with from half to a quarter of its bulk of water at ordinary temperature, and afterwards to wash in water containing a weak admixture of ammonia. Its special properties in the making of collodion are summarised tersely in the ninth edition of Hardwich's *Photographic Chemistry*, edited by Taylor, from which, without requiring the editor's permission, we make a brief extract to this effect:—Take a sheet of ordinary bibulous paper, and, having cut it into separate pieces, float them upon sulphuric acid diluted with half its bulk of water and cooled. Allow five seconds for the first, ten for the second, twenty for the third, and so on, until the last piece is gelatinised and dissolved, then remove the sulphuric acid carefully by washing and convert them into pyroxyline. A marked difference will be perceptible between the samples of collodion so obtained. The first noticeable effect of the previous parchmentising will be an increased fluidity and freedom from structural lines. The collodion, when poured upon a glass, sets very rapidly, and with such firmness that the finger may be rubbed backwards and forwards without disturbing it. The film on lifting from the bath soon becomes partially surface-dry, and repels developers or fixing agents. When washed with water and dried, it forms a dense and highly varnished surface, nearly impenetrable by liquids. The moist film, after development with pyrogallic acid and fixing, appears unusually tough, and will bear pumping on without injury. It is also very contractible, and tends to draw itself away from the edges of the glass. When pushed aside, it can be pulled back again like the finger of a glove. The fixing agent never removes any portion of the image from this collodion, because the iodide of silver is in the film, and not only upon its surface.

The properties above described, while present in all the samples of paper thus treated, are more decidedly evident in proportion to the time during which the acid is allowed to act. When, however, the action of the acid is carried to that point at which the paper begins to soften and become semi-gelatinous, then will the collodion be entirely different, the film being rotten and powdery. It is to be noticed also that the solubility of pyroxyline formed of this parchmentised paper in ether and alcohol is increased when contrasted with that for which we gave a formula in a previous chapter. The intelligent reader will already have reasoned that, by preparing and keeping in separate bottles two kinds of collodion, one possessing the extreme of toughness and the other that of rottenness, the addition of either, in definite quantities, to average good working collodion, will aid in imparting to it their specific properties.

One use to which, within two days of writing this article, we have had occasion to put a horny collodion of the above described class may be here described while the whole operation is fresh in our mind. It was the introduction of a figure from one negative into another negative, also containing figures. The system initiated by Johnston, of Wick, was that which was preferred. A portrait of a deceased member of a family was desired to be inserted in a domestic group, in order to complete the circle from which she was absent. The precise position she was to occupy having been determined upon, and with due regard to the lighting, a negative was taken the correct size from a larger photograph, the collodion employed being one of an unusually tough nature. By means of a camel's-hair brush and tincture of iodine, followed by reimmersion in the fixing bath, the surroundings of the figure were removed from the negative, the same means being taken to clear a space for the figure on the group negative, from which the varnish had been previously removed by caustic potash and alcohol in the usual way. It was then revarnished. Meantime the single-figure negative had been laid, face upward, in a rather strong solution of citric acid, which resulted in the tough collodion film being very soon found floating in the acidulated water, the film having left the glass upon which it was formed. After being washed, the dish had water to the depth of over half an inch poured into it, the group negative was laid on the bottom, face up, and the pellicular negative containing the single figure floated upon it and adjusted to the precise position it had to occupy. The toughness of the film permitted of this being done with the utmost ease, and without its showing the slightest tendency to tear. After draining off the water and drying the combination negative, a coating of varnish completed the operation.

Other applications of this system, such as placing a clergyman in a dimly lighted pulpit, or even putting the head of one person on the body of another, or similar forms of transference, will suggest themselves. If a figure is to be taken expressly for being transferred, some trouble will be saved if a black background be employed. A combination negative of the nature here described affords all the effect obtained by elaborate masking and double printing, with the additional advantage of simplicity of operating and identity of resulting prints.

IRREGULARITIES IN INTENSIFICATION.

Intensification is far less resorted to by photographers of the present day than it was a decade ago; indeed, it is scarcely too much to say that very many of those now practising with the camera are totally ignorant of what intensification means, or, if they wished to perform the operation, would be at a loss how to proceed. In days past it was the almost invariable practice with many operators to intensify after fixing, owing to the difficulty of accurately judging the precise density of the negative previously to the latter operation; others, again, proceeded on directly opposite lines, carrying the development well beyond the necessary point, and, after fixation, reducing the image, if too dense, to the proper point. In comparatively few cases was the best result obtained by simple development.

All this is changed now, and intensification and reduction are the exceptions rather than the rule in general work. The reason is not far to seek, for, by the introduction of machinery and other improvements in the preparation of the films, these are presented to the consumer of a far more uniform character than was formerly the case, and, knowing the plates, he is in a better position to judge what will be the reducing effect of the fixing bath, and to allow for it accordingly. The present-day plates, too, differ from the earlier ones in showing a clearer image by reflected light, a fact which also assists towards the formation of a better judgment of the precise density. With many, if not most, of the plates of a dozen years ago, it was necessary, in order to get anything like printing density, to carry the development far beyond the stage at which the image ceased to be visible either by reflected or transmitted light, and, under such circumstances, it is needless to say development was very much of the nature of a leap in the dark.

But, though intensification is no longer a regular necessity, it still occasionally happens that a mistake is made either in exposure or development, and that, after fixing, a little increase of strength is desirable. In such cases the almost invariable method adopted is that in which bichloride of mercury is employed, first of all, to bleach the image, followed by the application of one or other of a rather numerous list of reducing agents, by means of which it is again darkened to the requisite degree. The process is simple enough in itself, being purely mechanical in its operation, and devoid of necessity for the exercise of judgment, as in development. The only points to be observed are perfect fixation and perfect washing.

But here is where at the present day the difficulties supervene. It may be that films are more thickly coated than they were a few years ago, and require, for that reason, longer and more careful washing, as well as a more prolonged immersion in the fixing bath; but it is certain that, in the hands of the average photographer, intensification is more of a trouble, and causes more failures than it used to do. We are acquainted with more than one "old hand" who now approaches the operation with fear and trembling almost, although at one time it was a daily habit.

From our own experience and observation of others, we think the sole reason of the trouble where it exists lies in an alteration of the system of working, which, although we may imagine we are equally careful, really has the opposite effect. Thus, in past times, it was the custom in washing after fixing, and especially in the case of intensification, to place the negative under the water-tap for some minutes, if indeed, as was the case in many professional studios, a fixed arrangement did not exist by means of which a good flow of water—not a mere dribble—could be passed over the surfaces of a number of plates for any length of time. But now, since the introduction of washing racks and tanks and suchlike contrivances, although infinitely more compact and convenient, we fear in too many cases the result is a great loss of efficiency.

For instance, the simplest form of washing rack placed in an ordinary bucket will, if properly used, perform the work of removal of the hyposulphites as thoroughly, if not as rapidly, as direct washing under a stream of water. But there is just where the mistake arises. The rack, with its plates, is placed in a bucket or other vessel, and a small dribblet of water is allowed to trickle into it to keep up the illusion of a "constant stream." As a matter of fact, it is, perhaps, scarcely more than sufficient to disturb the surface water, and flows gently over the sides of the tank, while the negatives that are supposed to be undergoing washing are simply soaking in the dilute solution of hypo that forms the lower stratum.

Better than this pretence at keeping up a running stream is the practice of periodically changing the water, which, at least, ensures the removal of those portions of the soluble salts that have left the film, while, if the changes are sufficiently frequent and kept up long enough, the complete removal of all dangerous substances can be relied upon. We are here alluding to the most ordinary methods of washing now in use, especially by amateurs; but, if the washing tank be made automatic and self-emptying by the introduction of a syphon into its side, it becomes as perfect in action as any that can be applied. The smallest possible trickle of water will then serve every purpose, for the periodical emptying will ensure the removal of the hypo as it is extracted from the films.

With such an apparatus it becomes only a matter of experiment to find out what length of washing will effectually remove all soluble matter; but, where the water is left constantly dribbling, or is changed at irregular intervals, it is perfectly impossible to even guess when the work is properly finished; indeed, with some of the arrangements we have seen, it is questionable if the total removal of soluble matters would ever be effected. We tested the dribbling plan on one occasion, after having seen it worked by an amateur friend, and found that plates which had been subjected to the action of this so-called "constant stream" for a period of fourteen hours showed much stronger traces of hypo than a negative which, after a brief rinse under the tap, had been laid in a dish of water, which was changed every five minutes for half an hour.

In connexion with intensification with mercury, the necessity for very perfect washing exists both before and after the use of the mercury, but more especially after. If the plate has been thoroughly fixed—that is to say, if its immersion in the hypo has been sufficiently long to ensure the complete conversion of the silver salts into the soluble form, a comparatively short, if properly conducted, washing will suffice. If the plate is imperfectly fixed, no amount of subsequent washing will render it safe for intensification. The film may be apparently fixed, but, if there remain in it any of the insoluble double salt of silver and sodium formed in fixing, the mercury will inevitably bring it into prominence. In most, if not all, cases it can be detected as a heavier white deposit after bleaching, and though this may disappear, or nearly so, in the after-blackening, it is certain to reappear as a yellow or brown stain when the nega-

tive is exposed to light. In all cases where a negative is to be intensified, we should therefore strongly urge the use of a second and preferably fresh fixing bath after the first has *apparently* done its work, followed, of course, by a thorough washing.

If due care has been observed up to the point of bleaching, all that is needful after that is to see that the second washing is properly done. In the absence of any foreign matter from the film before the application of the mercury solution, there is no risk of the formation of dangerous insoluble compounds, and all that has to be done is the removal of the excess of mercury; but, owing to the hardening action of the latter upon the gelatine, its removal is by no means so easy as would at rst sight appear. Two or three hours at least in a constantly and properly changing volume of water will not be too much, and more will do no harm. If these precautions be observed, there is not the slightest risk in intensification with mercury, and if the proper reducing solutions are employed, there is no reason to doubt the permanency of the results.

The surface of the negative should always be cleaned between the various operations by means of a well-moistened tuft of cotton-wool in order to prevent the formation of an opalescent deposit on the gelatine, which, though it does not interfere with the printing qualities of the negative, gives it an unsightly appearance when dry.

Quantities of Silver in Commercial Dry Plates.—We understand that at an early date that indefatigable experimentalist, Mr. A. Haddon, will, before the members of the London and Provincial Photographic Association, read a paper in which he will give the results of experiments to determine the amounts of silver in the various commercial dry plates.

Another Novelty (?).—An evening contemporary, that occasionally "enlightens" its readers on matters photographic, announced one day last week that "one among the many uses found for magnesium is the furnishing of a brilliant light for photography." It then goes on to say that its powder, "mixed with chlorate of potash, produces a light much freer from smoke than the compositions of magnesium hitherto employed." One would have thought this would have been stale news some time ago. What a pity it is, when the lay press touches upon photographic subjects, it does not consult some one who knows something about them before doing so. Evidently what appears in technical journals takes a very long time te reach the lay press.

Medals.—A number of provincial Societies have recently been holding exhibitions, and the number of medals placed at the disposal of the Judges must have been ample to satisfy the most rampant pot-hunter. Indeed, in some cases, it is difficult to see how any exhibitor could possibly escape an award. With the regular pot-hunter a medal is a medal, and it scores, whether it be given by a "Little Pedlington Society," or any other body. By the way, small local Societies can now afford to be more lavish with silver medals, seeing, at the present price of the metal, that one of the size and weight of half-a-crown will only contain about sixteen pennyworth of silver. Anyhow, a liberal offer of medals usually secures a goodly number of exhibits from those anxious to obtain them.

Cheap Silver.—Photographers are not so directly concerned with the price of silver as they used to be in former times, or they would hail with satisfaction the present price of the metal, although few others do. During the past year or two we have several times chronicled the fact that silver had reached a lower price than it had ever done before. Just now the market is in a very unsettled state, and on Thursday and Saturday last week the record was once more broken, and bars were quoted at but one-eighth of a penny over two shillings and fivepence (29⅛) per ounce. This is less than half the price it was about twenty years ago, and there is a prospect of its becoming lower still. It would be interesting to learn if the wholesale price of the a nitrate is but half the price it was at that period?

Mrs. Rejlander.—We are sorry to hear that the widow of the famous O. G. Rejlander, through a long-continued series of reverses and illnesses, finds herself in such straitened circumstances that she is compelled to appeal for assistance in helping her to maintain a livelihood. It is thought that, by the sale of prints from many of her husband's well-known negatives, the disposal of a number of his enlargements, of which she has retained possession, and the procuring of printing orders from amateurs and others, such financial results will accrue as will be of material service to her, and we cordially invite our readers to participate in this excellent object. Mr. Snowden Ward has the enlargements for sale at the Memorial Hall, E.C., and communications can be made to Mrs. Rejlander, care of him at that address.

Passports.—It was reported last week, according to an Exchange telegram from Paris, that a proposal will be made to re-establish the passport system for persons arriving from this country. This is on account of the recent Anarchists' outrage in that and other cities. If France sets the example, some other countries will probably follow. More than once we have advised photographers going abroad to provide themselves with a passport, even to countries where they are not required. They are obtained without trouble; cost, if we remember rightly, but eighteen pence, and will do for all time. Now that there is extra vigilance shown on the Franco-German frontier, and the Anarchist scare is to the fore, this precaution is more than ever advisable. Although a passport may not be necessary in most Continental countries, the possession of one will sometimes prove a convenience.

The Photographic Society of Great Britain and Professional Photographers.—It was an excellent suggestion, made at the Annual Meeting of the above Society by Mr. W. S. Bird, that the Society should cultivate the professional photographer a little more. It is surprising to know that, among all its members, only about sixty are professionals, considering there are over four thousand in the country. Why is it so? Is it the fault of the Society or the professionals? In the early days of the Society, it was largely composed of the professional element, but now the latter seems to be practically unrepresented anywhere. It is true that the "National Association of Professional Photographers" has been in existence some years; but, beyond holding a few meetings and having annual dinners, what has it hitherto done? It is now proposing to start a co-operative concern, under the Limited Liability Act, for supplying materials to both professional and amateurs, and, as we said last week, we shall be anxious to see with what success it meets, particularly as we have in mind a similar affair that was started some years ago, and the result. In cultivating professional photographers a little more than it has hitherto done, we surmise the Photographic Society of Great Britain will be materially strengthening itself.

Timing Development.—We direct attention to a paper in another column, by Mr. Alfred Watkins, on "A Method and Instrument for Timing Development." Mr. Watkins has found that with a given plate, correctly exposed, and a normal pyro-soda developer, the time of appearance of the image bears a definite proportion to the time necessary to develop up the plate to printing opacity. Thus, under these conditions, if the half-tones be invariably taken as a guide and appear in a minute, development being com-

pleted in four minutes, that ratio will remain constant while the conditions are unaltered. It remains to be seen whether the principle holds good with regard to the newer developing agents. The action of these latter is, generally speaking, so different from pyro-soda that we suspect there will be some difficulty in making the principle of extended application. Pyro-ammonia is found to be unsuitable on account of the rapidity with which its energy deteriorates; on the other hand, it appears from Mr. Watkins' figures that pyro-soda up to a certain point determined by time remains practically constant in developing power. The paper teems with interesting points throughout and will repay careful perusal. We shall watch with interest any attempts to confirm Mr. Watkins' deductions, especially with metol and amidol.

Living Pictures.—A case of no little importance as regards the reading of the Copyright Act is now before the Law Courts. On Friday last the case of Hanfstaengl *versus* The Empire Theatre Company, Limited, and Baines & Co., was on in the Chancery Court. The plaintiff moved for an interim injunction, pending the trial of the action or further order, to restrain the defendants from infringing the copyright of the plaintiff in certain pictures by reproducing them in "living pictures" at the Empire Theatre; and, in the case of the second defendants, by drawings or sketches in the *Daily Graphic* newspaper. After considerable argument, *pro* and *con.*, by Counsel, his Lordship, Mr. Justice Stirling, said: "Was the grouping of human beings in a representation a reproduction of a picture within the meaning of the Act? It seemed to him it was not, and to hold that it was would be extending the meaning of the Act far beyond what the Legislature intended." As the defendants had undertaken to have photographs taken, and a record kept, of the backgrounds of pictures used, and an account of the receipts at the theatre, until the trial of the action, no order was made on the motion. The *Daily Graphic* also undertook not to print any more copies of the pictures. This case also stands over. Later in the day the plaintiff gave notice of appeal. We have since been given to understand that action has been taken against another illustrated paper with reference to the same pictures. The result of these actions will be closely watched by all holders of copyright, as it may materially affect their interests.

TELESCOPE MANUFACTURE IN DUBLIN.

Few, if any, of the larger and more important astronomical telescopes are now made without reference both to ocular and photographic observation. A very interesting account of those which have recently been, or are now being, constructed in Dublin by Sir Howard Grubb, F.R.S., has been published in the *Irish Times*, to whom we are indebted for what follows.

Sir Howard Grubb is worthily maintaining the great reputation which his famous workshops have long acquired as the foremost seat of telescope-construction in Europe. He has just completed the erection of the Greenwich instrument, which is the largest ever made in the Old World. It was commenced in the year 1886, and is one inch larger in the disc than the celebrated Austro-Hungarian telescope, also manufactured at the Rathmines works. The glass for the Greenwich great instrument was not obtained till 1889, although both of the manufacturers in Paris and Birmingham were engaged on it alternately; and the final discs used were made by Messrs. Chance Brothers & Co., of the latter city. The work at Sir Howard's factory occupied two years, and he announced its completion in March, 1891; but, as a new dome had to be made in Greenwich, a delay of a year occurred before its delivery, which was made on St. Patrick's Day, 1892. The great instrument remained at the observatory for quite a year before the building was ready for its reception, and it was erected and finally adjusted during the past summer. Sir Howard spent a considerable time in London at that period, being engaged in adjusting and finally correcting the mechanism, and giving the last finishing touches to the glass. This was necessarily done on the spot in this particular case, as the object-glass is mounted at present on the old Greenwich equatorial, and there was no possibility of trying it on celestial objects in Dublin while here—a circumstance which added greatly to the difficulties of the work.

At a recent meeting of the Royal Astronomical Society in London, the Astronomer Royal, Mr. W. H. M. Christie, announced to the fellows that the twenty-eight-inch object-glass of twenty-eight feet focal length for the Greenwich Observatory had been completed by Sir Howard Grubb, and he mentioned that he had brought with him some photographs which had been taken with it in the visual position. The twenty-eight inch object-glass is so arranged that, by separating the lenses and reversing the crown lens, it can be adapted for photography, but an opportunity had not been afforded for testing it in that position. However, he added, the photographs taken with it, adjusted for visual work, may serve to show the character of the object-glass. Pictures such as these were not to be compared with those which would be obtained with the object-glass corrected for photography, but they would show the adjustment of the lenses. The main point, the Astronomer Royal said, was the visual performance of the object-glass, which has not yet been adjusted for photography. Sir Howard Grubb had been engaged from September 22 to October 1 in adjusting the object-glass, the tube having been previously shortened to adapt it to the focal length as determined at Greenwich, and carefully balanced, all of which involved much work. There had been peculiar difficulties about this object-glass, because, the mounting already existing at Greenwich, Sir Howard had to make the object-glass without having any means of testing it on stars, and he had to rely on a terrestrial mark. The Astronomer Royal announced that, for about half an hour on the 1st of October, they were fortunate enough to get a very fine definition, and he was quite charmed with what he saw. It was shortly after sunset when they turned the telescope on Altair, and with powers of 780 and 1300 they saw the central disc and a number of rings very sharply defined. They could not detect the slightest fault in the object-glass, and it was clear from what they saw that night that the object-glass was a very perfect one, and that it would take a very fine night indeed to detect any error in it. Then they turned it on a test object, Delphini, which was distinctly and widely separated. Since then Mr. Maunder had been working with the object-glass, and, on an occasion when the definition was not good, he was able to separate the Delphini, though he could not use a power of more than 500. Jupiter had been examined. The definition was very fine, and the colour correction seemed to be very good. This is the highest testimony that could be given as to the perfection of the work done by Sir Howard Grubb.

Another instrument manufactured at the Rathmines works deserves a passing notice. At the meeting of the *savants* already referred to, Father Sidgreaves, the astronomer at Stoneyhurst College, announced the completion of a fifteen-inch telescope at that institution by Sir Howard Grubb, this replacing an eight-inch instrument previously in use there. This telescope, which gives in proportion as much satisfaction as the national one at Greenwich, was subscribed for as a memorial to the late Father Perry, who lost his life in British Guiana while engaged in the Total Solar Eclipse Expedition, December 22, 1889.

We turn from completed works to those at present in hand at the Rathmines factory, where much activity prevails. Sir Howard is now engaged in constructing the revolving roofs for the new Royal Observatory at Blackford Hill, Edinburgh. The building is in course of construction by the Government, in conformity with an arrangement made between them and the Earl of Crawford and Balcarres, who offered to hand over to the State all his equipments of astronomical instruments which he had collected at his observatory at Dun Echt, near Aberdeen, provided the Government would build a suitable observatory for them and for the instruments at present in the small observatory on Calton Hill. The telescopes in both places came from Rathmines, with the exception of the transit circle, so that this observatory may be regarded as having been furnished from Dublin. The drums of the revolving roof resemble the cupola of the Science and Art Museum in Kildare-street, but instead of stone they are of steel, covered on the outside with wood, and finally with sheet copper profusely ornamented. The smaller drum is twenty-two feet in diameter, and the larger one thirty-eight feet. Both are, as is the case with all observatory roofs, capable of being revolved on an elaborate system of anti-friction rollers. The larger drum will be mounted on Sir Howard's newest system, and, although weighing between fifteen and sixteen tons, it can be pushed round by a force of sixty pounds, which will be brought down by gearing to a force of about five pounds' pull on the driving rope.

Among the other instruments at present on the stocks at the factory is one nearly completed for a private gentleman who is erecting an observatory at Maidenhead. This telescope is of the same size as those supplied from the Rathmines establishment to the various observatories for the photographic survey of the heavens, but, instead of carrying a thirteen-inch photographic telescope and a ten-inch visual telescope, it will be supplied with a fifteen-inch refractor for visual work, and one of

the same aperture, but of peculiar construction, for photographic purposes. This last will consist of a double combination, being, in fact, two fifteen-inch object-glasses combined, so as to give the best possible results on a photographic plate. The instrument will therefere practically carry three fifteen-inch object-glasses, but it is chiefly to be noticed in connexion with the fact that it is the first opportunity Sir Howard Grubb has had of applying in the United Kingdom the principle of his lifting floor, which he originally devised for the Lick Observatory in California. This principle has for some time been adopted in the new observatory at Washington, and in the colossal one now being erected at Chicago, as well as in Berlin. The dome and the lifting floor for the Maidenhead telescope are already in their places and in working order, and the instrument will be erected in the spring, forming one of the completest private observatories in the United Kingdom. Another beautiful instrument is in course of completion at Sir Howard's factory, this being of the same size as the one just referred to. It is intended to carry a twelve-inch photographic refractor and a ten-inch visual refractor. For still another, a piece of glass, which is probably the finest ever produced, has been obtained, and is now in the factory, for the manufacture of an immense prism to place in front of the object-glass, and this is now in hand. It will, however, be a work of some years. An idea of its vastness will be gathered from the fact that this one piece of optical glass weighs at present 214 lbs., and that its value in the rough before working is about 800*l*.

AMERICAN NOTES AND NEWS.

Slide Exchanges.—The *Cosmopolitan* deprecates the lantern-slide exchanges and interchange system which appears to prevail extensively in the United States, and which has been increasing to an "unwarranted extent" during the past two years, and expresses the hope, for its own good, that its growth will not continue. It is of opinion that this idea of making a lantern slide of every subject that is taken has, beyond doubt, militated against the more careful production of print photographs. Its tendency has been to destroy that study of composition, and light and shade, which should ever be a ruling one with the amateur who would make of photography an art pure and simple. Many who at one time devoted a great deal of thought and time to the reproduction of a single good negative that as a print should yield a perfect picture have fallen into the careless and hap-hazard way of taking anything and everything that presents itself, and after development, if it is not entirely good, content themselves with getting a good lantern slide out of it, either by reducing or enlarging a fraction of the original. This is not art, nor is it photography. The *Cosmopolitan* notwithstanding, we have seen many admirable lantern slides, and prints too for that matter, produced in the way deprecated. Upon looking over several negatives, the subjects of which were not specially selected for the purpose, we find that from some of them two lantern slides which satisfy the condition of composition and æstheticism can be obtained. The angle of view included on the plate has something to do with this. From one, a panoramic negative which includes an angle of 120° on the base, four good slides, all different, may be obtained. For all that, there is much in our contemporary with which we are entirely in sympathy.

Blitz-Pulver.—A timely caution as to the selection of flashlight compounds bearing this name is given in the American journals. It appears that dangerous substances are again being placed on the market under various alluring names. In view of the facility with which some of them—*e.g.*, magnesium powder mixed with picric acid—explode, a law should be passed making it criminal to combine such substances. Dynamite we all know to be explosive, but it is not nearly so dangerous as the *otherwise* really excellent fulminating powder named. Magnesium powder and picric acid are, doubtless, safe enough in themselves, and probably are so also for a brief period after mixing, but eventually a chemical combination takes place between them, and picrate of magnesium is formed, which, if any one were carrying it, and accidentally fell and broke the bottle containing it, might cause a catastrophe similar to what befell the Anarchist the other day in the vicinity of Greenwich Observatory. The temptation to use picric acid or chlorate of potash along with the magnesium powder is great, but flashlight photographers will do well to strenuously resist it, as they value their lives. Although we have not yet tried it, we have an idea that picrate of aluminium will prove perhaps even worse than that of magnesium. Our advice is, For ordinary flashlight purposes use the pure metal alone. Let it not be forgotten that five individuals have already lost their lives by the explosion of magnesium powder to which a small quantity of picric acid had been added to increase its flashing properties.

The Hydroxyl-monohydride farce has been brought before the Turkeytown Hypo Club, of whose proceedings, the *American Journal of Photography* informs us, no reports have of late been allowed to the local paper, as that organization has followed the example of the Camera Club, taking the ground that, by the publication of their proceedings, outsiders virtually reaped the results of the members' labours, and stood upon an equal footing with those who pay towards the Club's support, and bear the heat and burden of the day. The ubiquitous reporter got access to a recent meeting, took down a full report of the proceedings, and published them in the *Turkeytown Weekly Chuckle*. From this it appears that Professor Gobler, the President, eulogised the important invention of his friend, Dr. Burton Coxe, F.R.G.S., of the Brondesbury Club, whose personal acquaintance he made during a recent visit to England. As a scientific man, he (Professor Gobler) was perfectly conversant with hydroxyl-monohydride which partook of the nature of eikonogen para-amidophenol hydrochlorate, and others, being a result of the dry distillation of the amido-naphthaline group of derivatives, with the thiocarbamides of sulpho-amyl. A member having put some awkward questions, and explained what the new chemical really was, the irate Professor said that, granting what the member said was true, he demanded a special meeting of the Board of Censors to take action upon the member's conduct in not having informed the Scientific Committee concerning it previous to its having been brought before the meeting. It is very evident that our American friends are quite enjoying the fun. Mr. J. Focus Snappschotte's report is very amusing.

How Stereoscopic Pictures are Sold in America—In *Wilson's Magazine* we have a hint as to how these pictures are sold, and an idea of the profits derived by the canvasser. Messrs Underwood & Underwood, stereoscopic publishers, of New York do not make negatives, but purchase them from stereoscopic photographers, and make their sales through canvassers. Orders are taken from door to door for views and stereoscopes, the deliveries being made afterwards. These canvassers speak enthusiastically of their success, some of them making, as clear profit, as much as 250 dollars (50*l*.) per month. Over three million of the slides are alleged to have been shipped to England, which their agents retail at eight shillings per dozen.

ON THE EFFECT OF THE SIZE OF THE APERTURE IN THE DIAPHRAGM ON THE ANGLE OF VIEW OF A LENS.

[Dundee and East of Scotland Photographic Association.]

Let an axial section of the lens and mount be made, let A A′ be the lens, H H′ the diaphragm plane, O C the points where A A′, H H′ meet the axis, F the focus, R the radius of the aperture of the lens, *r* that of the *aperture* in the diaphragm (called hereafter *the opening* simply, for brevity), *f* the focal length, *a* the distance from lens to diaphragm.

Let us, first, consider the case when, as in a landscape lens, the diaphragm is in front of the lens (fig. 1); and let us assume, as is practically the case, that the object viewed is distant, and that the rays received by the lens from any point on it form a parallel pencil. Then any such pencil, after passing through the opening D D′, will be wholly transmitted through the lens, provided that the extreme ray of the pencil falls on the lens. The greatest obliquity consistent with this is when, on one side, the extreme pencil is in the direction A D; and similarly for the other side. The angular magnitude of the fully illuminated (say, *complete*) view is indicated by the ratio

which H D bears to A H, or R − r to a; this angle is greatest when the opening is least, and the variation is of some importance. The

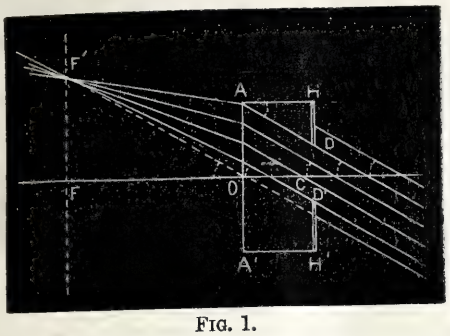


FIG. 1.

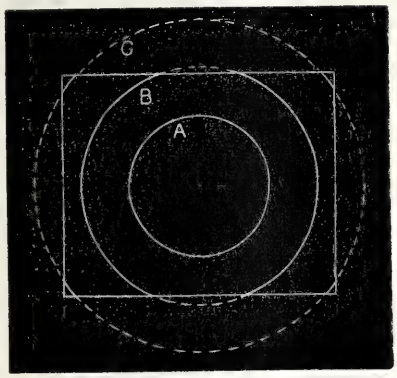
actual radius F F′ of the complete view is easily seen to bear to the focal length O F the ratio of H D to A H, or in symbols

$$\frac{D}{f}=\frac{R-r}{a}$$

As an illustration, I take a landscape lens from a list by a well-known maker. It is intended to cover a plate 10 × 8, or a circle of 6·4 inches radius. The numbers are f=10 inches, R=1·06 inches, a=1·75 inches, and it is stated to work at f/8, or r=·62 inch. The formula gives—

$$D=10\,(1{\cdot}06-{\cdot}62)\div 1{\cdot}75$$
$$=2\tfrac{1}{2}\text{ inches.}$$

So that a small part, about 20 square inches, or one-fourth of the plate, is completely covered (fig. 2, A). With an opening f/16 D,



The rectangle represents the 10¼ × 8 plate; scale, ⅛.

FIG. 2.

becomes 4¼ inches (fig. 2, B); with one f/64, D is 5½ inches; and with a pinhole, or when r = 0, D becomes 6 inches (fig. 2, C). Thus, under no circumstances, is the plate completely covered.

A simple diagram can be drawn to suit any given lens, thus: Take a straight line O F (fig. 3) equal to the focal length, f, of the

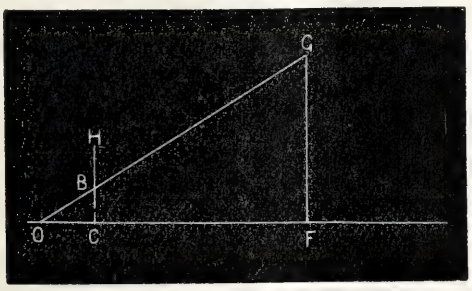


FIG. 3.

lens, measure off O C equal to the distance a from diaphragm to lens, erect a perpendicular C H equal to the radius R of the lens, and cut off a length H B from H C equal to the radius of the opening. O B will cut the perpendicular through F at G, such that F G is the radius of the complete view; and, of course, F O G is half the view angle.

When the diaphragm is behind the lens the case is more interesting, and applies to a doublet of any kind. Using the same notation, we see at once that the pencil of rays that crosses the diaphragm plane is convergent, not parallel, as before, and therefore the construction is not quite so simple. It is clear (fig. 4) that the axial pencil of parallel rays received on the lens converging towards F is narrowed down in the plane H H′ to a diameter Q Q′, which bears to A A′ the

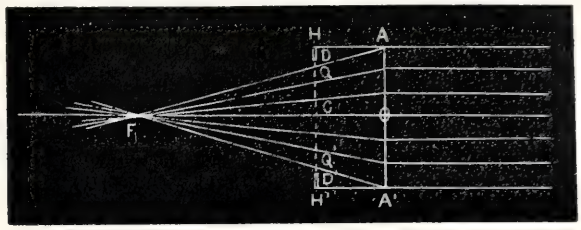


FIG. 4.

ratio of F C to F O, or $f-a$ to f. Thus the radius of the circular section of the pencil is reduced from R to

$$\frac{R\,(f-a)}{f}$$

There are two sub-cases: first, when this quantity is less than the radius of the opening; secondly, if, as is more commonly the case, it exceeds this radius. In the first case (fig. 5) A D will be the extreme

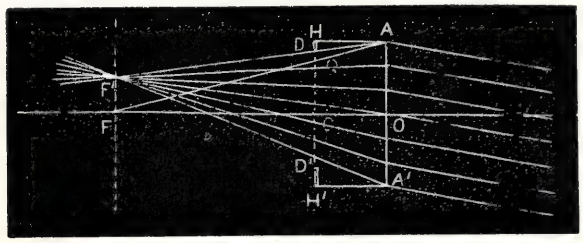


FIG. 5.

ray of the most oblique pencil that can completely pass through the opening D D′ on one side, and, if A C cut the focal plane as before in F′, F O F′ is the semi-angle of the complete view, and it is indicated by the ratio of F F′ to F O, or of D Q to H A. But D Q equals C D − C Q, or

$$r-\frac{R\,(f-a)}{f}$$

It will be seen that this diminishes with the opening r until when this opening becomes equal to the section Q Q′ of the complete pencil, when only the axial pencil gets through undiminished, and the complete view is limited to the central point.

If the opening is *less* than this section, we have our second case, no pencil gets completely through (fig. 6), and we note one important

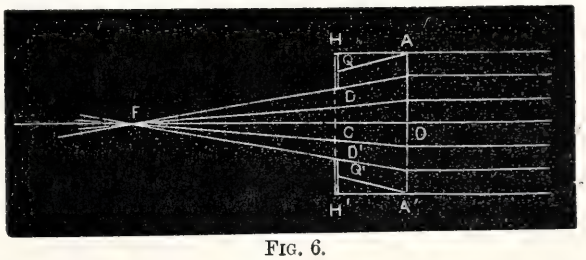


FIG. 6.

difference, that the view, except at its centre, is now formed by excentrical portions of, instead of the whole of, the pencils that fall on the lens. The complete view will be determined by finding the

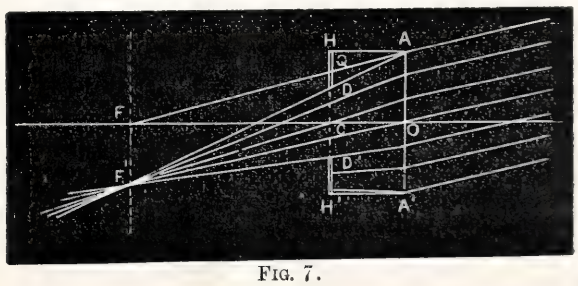


FIG. 7.

limiting pencil, which completely fills the opening. This is that one whose extreme ray is as before A D F′ (fig. 7) and the semi-angle of

the complete view is now indicated by the ratio F′F to O F, or Q D to H A, where Q D is equal to Q C − D C or

$$\frac{R(f-a)}{f}-r$$

This clearly increases as r diminishes to a point.

We notice that (1) the image in the first case is formed by centrical, in the second by excentrical pencils; (2) two openings may give the same complete view, namely, when calling their radii r_1, r_2.

$$r_1-\frac{R(f-a)}{f}=\frac{R(f-a)}{f}-r_2,$$

in which case their sum is twice the breadth of the full pencil at the diaphragm; (3) a certain opening gives the same complete view as the full aperture, light being lost while definition is gained; (4) that a similar (but more elaborate) geometrical construction to that shown in fig. 3 gives the view angle.

It is clear that the case of the diaphragm behind is of no practical application except when the lens is a doublet of some kind, and that the back lens has nothing to do with the angle of complete view.

When the lens is symmetrical, it is easy to show that the magnitude of the opening that gives the same complete view as is obtained without any diaphragm at all is equal to the illuminated circle seen on the back lens when the combination is directed towards a bright, distant source of light.

With such a lens it is also not hard to show that the actual radius of the complete view is given by

$$f\cdot\frac{R(f-a)-rf}{2a(f-a)}$$

where f is the focal length of each element in the combination.

As an actual example I exhibit a symmetrical lens, marked 10×8, and therefore supposed to cover completely a view of 6·4 inches radius. On measurement f is found to be 25 inches, R ·8 inch, a 1·25 inches, and the radius of the complete view comes out nearly

$$D=8-10r.$$

Noting that the equivalent focus F is 13 inches, we find that when the aperture is $f/40$, r is ·16 inch, and D = 6·4, and this is the largest opening that covers the plate completely. If $r=0$, or is very small, D=8, and the lens will cover 10×12 easily, which it does; and if r=·8 inch, answering to $f/8$, the largest opening supplied, the field of complete view is reduced to a point on the axis of the lens. For r=·2, a good working stop equivalent to $f/32$, we have a field of 6 inches radius. There is thus a very marked gain in using small openings.

Nothing has been said here as to the loss due to reflection in the case of oblique rays, but it is clear that this only accentuates the "incomplete" portions of the field in an increasing ratio.

It seems likely that the large apertures often used for "instantaneous" work may explain the falling off of light from the centre of such pictures that is so often noticeable. Frequently the illumination is only "complete" at the centre, and rapidly diminishes outwards.

J. E. A. Steggall.

A METHOD AND INSTRUMENT FOR TIMING DEVELOPMENT

[Central Photographic Club.]

One of the results of the large amount of investigation and discussion respecting the sensitiveness of plates is that it is becoming very evident that the sensitiveness and facility of development of a plate are two entirely separate factors, which must be kept distinct from each other. Messrs. Hurter & Driffield have made this clear in their method of ascertaining the sensitiveness of a plate, and, in my opinion, the leading principles of their method are unassailable.

You will remember they point out that, if a long series of exposures be given to different parts of a plate, each exposure increasing in geometrical proportion to the last, and the plate developed, that in one part of this series there will be found a range of densities which have a uniform mathematical ratio to each other, and that the position of this range (called the period of correct exposure) determines the sensitiveness of the plate. They also point out the most important fact, that the time of development, and even the constitution of the developer, does not alter the position of this period of correct exposure.

But they do not dispute the fact—which is only too evident to every practical photographer—that in making a negative of a group of objects reflecting various amounts of light, the necessity of giving such an exposure that most of the light intensities shall fall within the period of correct exposure is not the only thing to aim at. The negative will still print on the sensitive paper a scale of tones which will falsely represent the objects photographed, unless it is developed to one particular depth. If under-developed, the range from black to white will be too wide, and the print will be flat; if over-developed, the range from black to white will be too short, and the print will be harsh and chalky. In other words, time of development is quite as important as time of exposure.

Mr. Howard Farmer, in an admirable paper recently read before the London and Provincial Photographic Association, gives the fullest explanation of the relation between exposure and development yet published. He emphasises the point that, in the latter branch, time of development is all-important, more so than strength of developer.

It is with time of development alone that I deal to-night. I presume that an approximately correct exposure has been given, that a developer is being used which experience has shown to be suitable to the plate and the subject. I make no claim that accurate timing of development will make up for carelessness in exposure, or the use of an unsuitable developer. The time of development depends upon many influences, such as exposure, temperature, concentration of developer, amount of bromide, proportion of alkali to developing agent, &c.; and, as these factors are subject to many variations, all writers seem to take for granted that it is quite impossible to lay down any other guide than that of judgment and experience, or, in other words, the method of trial and error.

I therefore occupy the position of being the first to attempt to lay down any practical rules in the matter, for, although Messrs. Hurter & Driffield's method affords means of measuring the "development factor" *after* the plate is developed, it affords no information whatever of use to the photographer about to pour on the developer.

I wonder if any one present has ever analysed the method he follows in timing development. The usual answer would be, "I go by the appearance of the image, and by looking through the negative against the red light I judge when it is dense enough." Another (using thinly coated plates) aids his judgment by the appearance of the image at the back of the plate. Probably many are under the impression that they judge only by looking through the image, and are not aware that this is only the final of a series of observations, and only acts as a kind of clincher.

My own idea is that the method followed by an experienced photographer is something like this:—He carefully watches for the appearance of the image; the rapidity with which it appears determines the length of the pendulum (the speed) of a mental clock, which immediately starts within him, and his previous experience of that particular plate, developer, and subject determines the number of swings the imaginary pendulum takes to complete development. Now, the rapidity with which the image appears can be best observed by taking one particular tone in the picture—say, the grass in a landscape negative—and noting the time which elapses between the pouring on of the developer and the first appearance of that particular tone. I shall frequently have to refer to this factor as "the time of appearance."

The method I am about to describe originated in the following way. I am in the frequent habit of testing batches of plates for sensitiveness, giving each plate three different exposures, developing altogether (usually six different kinds of plates) in one dish. At first I developed all for the same time; but, observing that in some makes of plates in which hard gelatine was used, the image came up very slowly and the development also proceeded slowly, these plates were therefore at a disadvantage as regards opacity in comparison with other makes.

Although, in estimating the sensitiveness of the plates from the appearance of the negatives, I left opacity as much as possible out of consideration, I thought it desirable not to handicap those plates so much in development, and accordingly decided to develop all the plates for times in exact proportion to the appearance of the image. For this particular purpose the method is by no means perfect, but I observed that any influences (temperature, alkali in developer, amount of bromide, &c.) which lengthened or shortened the time of development, also lengthened or shortened the time of appearance. The investigations, of which I now give the result, were then commenced. The conclusion arrived at after many hundreds of experiments, and the principle which is at the root of the method of timing development I propose, may be expressed as follows:—

With a correct exposure on a given plate, with a given developing agent, the time of development required for a given printing opacity has a fixed arithmetical ratio to the time of appearance, provided the developing power of the solution remains constant during development; and this rule holds good for all variations of strength, amount of alkali or bromide, and temperature within those limits which have been found safe in practice.

To apply this rule in practice, the photographer makes a preliminary trial; he notes the time of appearance of the half-tones of the picture, such as grass in a landscape (say, sixty seconds); he gives a total development, say, of four times this (four minutes), and if, when fixed, the negative proves to be the printing opacity he likes, he will conclude that "four times" is the development factor for that particular plate. If, on another day, he notes the time of appearance of the same range of half-tones, and gives a development of four times again, he will get the same printing opacity for that particular half-tone, even although the developer may vary in strength, temperature, &c., from that previously used.

My experiments so far have been with pyro developer only; I cannot say whether the same rule does or does not apply with other developing agents. Nearly all the trials were conducted with a sensitometer on the Spurge plan, a quarter-plate box divided into three chambers, illuminated by means of three diaphragms whose areas bear the ratio of 1, 5, and 25. I selected these ratios as being approximately the ratios of sky, half-tones, and darker parts in a landscape negative.

The sensitometer was exposed to a white surface illuminated by a fixed quantity of magnesium ribbon burned at a fixed distance, the light being of such intensity as to bring the three exposures approximately within the period of correct exposure.

The general method adopted, when testing whether time of appearance made correct allowance for variations in the developer, was to expose a plate in the sensitometer, cut it in half, developing one half in normal developer and the other half in the modified developer, giving, say, four times of appearance in each case, and taking the middle tint as the guide.

In many cases several strips of the plate were developed in the slower developer, one being given the four times, the other, say, five and six times the time of appearance. When fixed, the strips were carefully compared together, a pair of apertures being cut in a card for the purpose, and the result noted. In my earlier trials I used pyro ammonia (the developer to which I am most accustomed), and was much puzzled by unexpected variations, the slower developer requiring longer exposure than indicated by the time of appearance, but in all kinds of ratios.

I began to think that my theory was incorrect, for, according to precedent, it is difficult to believe that a formula so simple as not to contain a single logarithm, not even a Greek symbol or a square root, could possibly be correct.

But the cause of the variation was finally traced to the fact that pyro-ammonia rapidly declines in developing power, and that the rate of this deterioration is not constant, but depends upon the proportion of exposed area of solution to the bulk, and also whether the ammonia is near the minimum quantity necessary for efficient development.

The following table gives details of an experiment illustrating this :—

Table I.

	Development in Minutes.	Comparative Time of Appearance.
Pyro-ammonia, normal strength, appear in 35 seconds	0	100
	3½	120
Pyro-ammonia, diluted, appear in 60 seconds	0	100
	6	141
	8	150
	9	166
	10	181

For this experiment a plate was exposed and cut into twelve strips. One strip was put to develop in normal pyro-ammonia; and four other strips into the same developer diluted with equal bulk of water. The strip in normal developer appeared in thirty-five seconds, and was developed for six times this. The strips in dilute developer appeared in sixty seconds, and were developed for six, eight, nine, and ten times this respectively. As each strip was taken out, another exposed strip was put in to test, by time of appearance, whether the developing power of the solution had deteriorated. The result of these time of appearance trials are reduced to a common denominator (of 100), and given in the last column. It was found that a strip developed in the dilute developer took nine times time of appearing to reach the same opacity as the six times plate in the normal developer. The reason of this will be seen in the last column, for, while in the short development of three and a half minutes the developer had only deteriorated from 100 to 120, in the long development of nine minutes it had only deteriorated from 100 to 166.

This result shows that pyro ammonia is quite untrustworthy for calculating time of development. I shall be sorry to overturn my favourite bottle of ammonia ·880 from the place it has occupied in my dark room for the last twelve years, and, when I take out the stopper for the last time, it will not be done without shedding a tear. Pyro soda, on the other hand, seems quite suitable for the method.

Here is a table illustrating the comparative falling off of each at different times of development. Each is the average of two trials with weak and strong developer, and the results are reduced to a common denominator.

In practice few negatives require more than fourteen minutes, and the falling off in power of the pyro-soda is quite insignificant for this time, being an average (spread over the whole time) of about 4½ per cent.

The quantity of solution used makes an important difference. In one test with pyro soda, while 2 oz. on a plate weakened in eighteen minutes' developing from 100 to 128, time of appearing, 1 oz. of the same developer, in the same size dish, weakened from 100 to 160 in the eighteen minutes.

Table II.

Minutes Developed.	Comparative Time of Appearance.	
	Pyro Ammonia.	Pyro Soda.
0	100	100
6	111	102
10	142	104
14	210	109
18	240	122
22	360	130

The following table illustrates the stability of the ratio of time of appearance of the three different tints formed by the sensitomer. They are the result of the first nine tests I made with pyro-soda, and were made with widely varying conditions of developer, as regards strength, alkali, bromide, and temperature. The actual time varied from 75 seconds to 310 seconds for the first tint, but they are reduced to a common denominator for comparison. The plate and exposure were alike in all:—

Table III.

Comparative Time of Appearance.		
Dark Tone.	Medium Tone.	Light Tone.
100	152	233
100	142	250
100	142	225
100	140	225
100	150	238
100	134	220
100	152	230
100	153	225
100	138	220

It will be seen that the ratio (allowing for errors of observation) is practically identical in all. This points to the fact that in estimating development by time of appearance it is immaterial what tone is taken as a guide, provided all are within the period of correct exposure, and a proportionate development factor is used for multiplying by. For instance, if four times' time of appearance gives the correct opacity for the darkest tone in this table, practically the same result would be gained in each case if the lightest tone was observed, and nine times' time of appearance given.

This table tends to support Messrs. Hurter & Driffield's well-known theory; but, even if the theory be not correct, my method holds good, for it enables the photographer to get the printing opacity he requires for any particular tone with any variation in development.

We will examine the various factors affecting development.

Exposure.

I make no claim that this method makes up for large variations in exposure, and, indeed, I have no faith in exercising great skill in one branch of photography in order to make up for gross blunders in another. There is always, however, a limited range of exposure, varying, say, from one to two for thinly coated plates and from one to six for thickly coated ones, within which fairly uniform results can be got by varying the length of development.

Development by time of appearing gives more time to the shorter exposures, but not (so far as I have observed) sufficient to give quite as much opacity as the longer exposures. This point, however, requires further investigation.

Concentration of Developer.

My method secures uniformity within those limits that photographers usually keep to. Probably, if an exceedingly weak developer, requiring an exceedingly long time of exposure, were used, the falling off of the developing power towards the end of development would have to be allowed for.

Alkali.

Here, again, are limits well known to practical men, as, on the one hand, it is possible to cause rapid fog by excess, or, on the other, total inefficiency by insufficient alkali. Within these limits I have found time of appearance a sure guide. In the case of pyro-soda the variation in amount of alkali does not seem to have much effect on time of appearance or development.

Bromide.

The influence of bromide is interesting. Messrs. Hurter & Driffield note that its use cannot alter the relative gradation, and the fact that it cannot alter the ratio of time of appearance of different tones supports this view. But I think I can point out why photographers have an idea that it tends towards greater density on the high lights.

Here are two strips which have received identical exposure in my sensitometer. One was developed in normal developer, and appeared in sixty seconds; it received three times this development. The other appeared in 130 seconds in a developer containing an extra two grains to an ounce of bromide, and also received a development of three times. A comparison by eye—and, no doubt, in the photometer—will pronounce the strip developed with bromide to have decidedly the greater opacity throughout. It is, however, quite of a different colour to the other, both being free from fog. But here is a print (on a lantern plate) from the two strips side by side, and it will be seen that the actinic opacities are practically identical, and, as the sole aim of a negative is to print from, this is the important part. I have confirmed this matter by several similar trials.

In comparing printing opacities on different plates, therefore, it is evident that photometric measurements are unreliable. But this does not upset Messrs. Hurter & Driffield's theory, which is based on a comparison of densities on one plate.

Plates.

I have no doubt that different makes of plates will require different development factors, that while one will give sufficient printing opacity with, say, three and a half times' time of appearing, another will require five times, but I have made no definite investigations on this point.

Temperature.

A developer may be used so warm as to cause fog, or so cold as to give under-exposure, however long the development may continue. The limits of safety probably vary with different developers, and with pyro soda 45° and 70° Fahr. may be taken as the limit. The time of appearance varies widely with the temperature. In a trial at 48° and 66°, the temperature being kept uniform by water baths, the relative times of appearance were sixty-two and 165 seconds, and when developed in this proportion the results were equal.

In the practical application of the method it is necessary to note down on paper the time of appearance as recorded by the second hand of a watch and then do a small sum in multiplication. This, as I know by experience, is somewhat troublesome in the dim light of the dark room, and I feel sure that a simple timing instrument, which will not only record the time of appearance, but automatically multiply by the development factor, and indicate the end of the development, is desirable.

In introducing what is not merely a new instrument, but one for a new purpose, it becomes necessary to give it a name, and as it must be of the nature of chronometer, I make use of the word eikon (picture), and blend the two into

Eikronometer.

There are many ways of devising such an instrument, and it is by no means certain that the one I shall explain will be the final one put on the market. A clock-dial instrument would have some advantages. It is well to mention (for the benefit of those commercial sharks, who are ever ready to appropriate other people's brainwork) that my patent not only covers the particular instrument I describe, but includes the whole method of taking the time of appearance as a factor for calculating time of development. I need scarcely add that the use of the method (with a watch) will be perfectly free to all, but any special instrument carrying out the method is secured to me.

My eikronometer is a sand-running instrument about eight inches high. When the developer is poured on, it is turned upside down, and the sand pours through an aperture which can be controlled by a screw adjustment; the moment the image appears, the eikronometer is turned over again, and the amount of sand which has run through during the time of appearing has now to pass through a smaller aperture. In this way the time of appearing is multiplied by whatever developing factor is found desirable, and, when the sand has all run back, the development is complete.

And it is not merely in practical negative-making that I see a future for this method. Great is the outcry for reliable information regarding the speed of plates as a guide for *exposure*, but can we not now hope that each box may be marked with information which will tell how long that particular plate ought to be developed?

The Hurter & Driffield system indicates the speed of a plate by pointing out the correct position of the period of correct exposure. Why should not the *centre* of that period be taken as the indicating point? It is the strong point, and the point which we strive to make coincide with the central half-tone of our scale of light and shade when we take a picture. The printing opacity for this central half-tone is a known factor; will it not be possible to state accurately how many times' time of appearing is required to gain this opacity?

I know that many heads will be shaken at the coming tendency towards what they are pleased to call mechanical photography. We all know the value of artistic judgment in picture-making, but, when the artist has (in the matter of exposure) decided upon the scale of tone he requires, why should he not make use of methods of accuracy to aid him in getting what he wants? and in this department of development, when he has exercised his judgment upon the scale of opacities he requires in his negative, I fail to see why it is artistic to use slipshod methods at the risk of not gaining the effect he desires. Alfred Watkins.

OLD, YOUNG, AND NEW.

The following appears in the current issue of *Wilson's Magazine*:—

It is not often that I find anything with which to disagree in your best of all possible photographic magazines. I have always looked upon it, and loved it, as the mainstay of art in photography. Indeed, there have been times of which it might be truly said of you, "Among the faithless, faithful only he;" yet now, December, 1893, when I look upon your magic mirror, "The Ground-Glass," whereon I am accustomed to look for a "true image of the mighty world," I find it making a hideous grimace at me. There appears upon its surface nothing less, indeed, than the monstrous accusation that the old photographers of England "stand in the way of approaching genius, and frown upon the efforts of the young to compete for medals." And this is said in connexion with an institution—the Salon—one of whose chief functions is to discover budding genius and to foster it! Don't you know that we as a body are accused of being *too* young? If you will try to think seriously on the subject, and look at it from all points of view, you will find that, instead of being the old photographers, we are the *new*. We are accused of not keeping to the old lines; of ridiculous exertions to improve the art; of not focussing our pictures as our forefathers did; of refusing to use albumenised paper; of thinking for ourselves and allowing others to do the same; of trying to be individual and perhaps original; in short, of using our best endeavours to elevate photography into the region of fine art—your own praiseworthy object, sir, as well as ours; and, more dreadful still, we are accused of success, and know that it is true. We confess we blush, but, young as we are, we bear it with the stoicism of habitual criminals.

"The Ground-Glass" says that the "old" photographers "chafe somewhat over seeing their pictures hung beside those of the 'young' on an equal footing." This imputation is unworthy of your semi-transparency; is untrue, and should not have been made without verification. A glance through the catalogue would show that most of the principal exhibitors were not only young men, but young photographers, and one of the most important places was given to a hitherto unknown outsider; and one of the points of which the organizers of the Salon are proud is that it was the first to bring Craig Annan and some other young photographers prominently before the world as exhibitors. That they could give up the cheap seductions of easily won medals is, of course, to their honour; but still more is due to their common sense, which does not allow them to see much value in what can now be gained by almost every user of a camera who will take the trouble.

In another part of the same number of your journal there is a paragraph by one I am sorry you call your London correspondent, commenting on the Salon. If you will read between the lines, I am sure your better judgment will show you that this is a most prejudicial statement. The Salon had a fair sprinkling of everything new in pictorial photography, as was its duty; but it was not "made up," as your correspondent says, of pictures of the out-of-focus school. It was a surprise to me there was so little of that kind of work; but what was there was conspicuous for its originality. It is known that I am not a follower of this school myself, but I can admire, very heartily indeed, any honest attempt to save us from the dismal monotony of apathetic mechanism into which we were drifting. It is true we were not "generous" to the unsuitable or the incompetent, and exigencies of space compelled us unwillingly to decline many excellent pictures, but the committee selected what they thought would promote the objects of the Exhibition, quite apart from personal considerations. It is a fact that prominent members of the committee had many of their works rejected, and I can assure you that no influence, if any had been attempted, would have had any effect on the hanging committee.

We have had a good deal of opposition; it decreases, however, rapidly as we are better understood. I do not want to impute motives, but it is unfortunate that the education of many who have pushed themselves into prominent places, and part of the photographic press, has not been carried beyond chemistry and optics; these we look upon as the elements that can be prepared for us, and *begin* where they leave off.

In conclusion, I ask you to accept the word of an old friend, whose life, nobody knows better than yourself, has been devoted to the promotion of

photography as an art. The *New Movement* is sound and will live. Its object is to improve the art we all love, although we fraternally fight over it, and no personal considerations are allowed to come in the way. We encourage the young, but the young must be of the kind you mistakenly say we neglect, "approaching genius;" it is not our mission to encourage the young in the wrong sense. It is not for us to distribute honours and awards so profusely as to make honours and awards ridiculous. Any photographer who wants to join us must be content with the honour of helping pictorial photography, and no photographer can join our Society until he has shown at our exhibitions that he is likely to worthily wear his spurs when he has won them.

I hope now, sir, that I have removed that distorted blur from the face of "The Ground-Glass," and left a fairer picture. H. P. ROBINSON.

PHOTOGRAPHY: PAST AND PRESENT.

BEFORE the Midland Camera Club, on February 16, Mr. R. J. Bailey in the chair, Mr. J. W. Beaufort lectured on "Photography: Past and Present."

The remarks concerning the amateur are worthy of note, when it is remembered that Mr. Beaufort is one of the leading professionals of Birmingham. He said: "Ten or fifteen years ago there was a general idea that the rapidly increasing number of amateurs would be the ruin of photography as a profession—many eminent professional men predicted this. Had it not been for this amateur rage, photography would not have made the rapid progress it has. It would have been treated by the public as it was twenty years ago, when the '*carte-de-visite* mania' was at its height, as a novelty, instead of which it is gaining ground every day as a necessity. For this, we must show our gratitude to the amateur. He has done the profession more good than harm. Intentionally or unintentionally, he has helped to build it up to what we now find it: in the first place, by educating his friends to distinguish the merits of good photography; and, secondly, by showing the third-rate photographer that his existence is not required. He has spurred on the high-class portraitist, who now makes portraiture an art more than a science, and feels his position a more dignified, if not a more remunerative, one. But all this only goes to prove the old saying, 'There's always room at the top.'"

The amateur is responsible, in a great measure, for the great change made in our illustrated papers. There is another use for the amateur, he helps the plate and paper-makers to establish the colossal factories which are now to be seen.

The one who does most good to photography is the scientific man; the "hand-camera fiend" is only of service to the plate-manufacturers.

After giving a *résumé* of the history of photography, accompanied by excellent and interesting slides, the lecturer went on to explain the modern uses of photography in astronomy, war, criminal investigation, &c.

After condemning the practically indiscriminate awards of medals, the lecturer advocated one large exhibition in London, the number of exhibits from each person being limited; no award to be made unless the exhibitor had sent pictures for three years, and no exhibitor being allowed to receive more than one medal. Then any one possessing such an award might be justly proud.

News and Notes.

THE EXETER EXHIBITION.—The Judges will be Messrs. Valentine Blanchard, A. W. Claydon (Principal of the Technical and University Extension College), and Dr. Jas. Cheese (President of the Society).

NETZ-PAPER.—We have received from Herr E. Liesegang, Düsseldorf, a specimen print on a matt-surface gelatino-chloride paper he has manufactured since August, 1893. The print, which has a pleasing effect, has its surface grained.

THE Platinotype Company write: "We beg to inform you that, our present offices being quite inadequate for the rapidly increasing extent of our business, we have secured large and commodious premises at No. 1, Charlotte-street, Bedford-square, W.C. (close to the British Museum)."

TO-NIGHT, Friday, February 23, a paper by Mr. A. H. Wall, on *The Beginnings of Artistic Photography*, will be read at the Central Photographic Club, Coleman's Hotel, 13, Henrietta-street, Covent Garden. Next Friday Mr. C. F. Robinson will read a paper on *Mezzotype and other Rough-surface Papers*. Visitors are cordially invited.

THE ILLUSTRATED JOURNALS PHOTOGRAPHIC SUPPLY COMPANY.—Under this name a Company has been formed at 62, Ludgate-hill, E.C., for the purpose of supplying illustrated journals with photographs of prominent men and women, interesting places, and all such subjects as lend themselves to the photographic art. Arrangements are being made with photographers in every part of the United Kingdom, so that if the subject desired is not in stock it can be secured in twenty-four hours, and in important cases within six to twelve hours. Photographs of all the important persons of the day, and all the important subjects of the day, will be taken and kept in stock, and special series will also be arranged for.

THE WOOLWICH EXHIBITION.—Mr. H. J. Dalby writes: "Your report of the Woolwich Exhibition is very much to my mind, but I think the premium placed upon flat, over-exposed, and technically bad photographs, by the Judges awarding a silver medal to *Smoky Thames*, is not much of an inducement to send good photographs to Exhibitions. I enclose, with compliments, the photograph of *Cornflower*, which you call 'rather hard,' it having taken the bronze medal by public vote." The Hon. Secretary of the Exhibition writes: "The public judging at the recent Exhibition resulted as follows:—1st, *Cornflower*, Mr. H. J. Dalby, Woolwich, sixty-nine votes; 2nd, *Galatea*, Mr. W. W. Winter, Derby, sixty-six votes; 3rd, *Out of Luck*, Mr. W. W. Winter, fifty-eight votes."

CROYDON CAMERA CLUB LANTERN SHOW.—Mr. A. Bellin's series of views, taken during a journey made last year *Within the Arctic Circle*, added to his graphic and humorous talk, proved on Wednesday, the 14th inst., vastly to the audience's taste, the speaker's remarks being plentifully punctuated by either applause or laughter, and the response to the President's appeal for a vote of thanks was eloquently demonstrative on the part of the audience of their satisfaction. Several of the slides were notably peculiar; thus the mountain of *Cad's Heads*, also the *Traveller in Bed*, which provoked much merriment. Nearly all the views were snap-shots, which, as the photographer was blessed with a day two months long, were possible at any hour out of the twenty-four. Subsequently the following members displayed slides:—Messrs. Charles Bray, A. Hirst, H. E. Holland, J. Smith, and G. R. White.

CAMERA CLUB PHOTOGRAPHIC CONFERENCE, 1894.—The 1894 Conference will be held in the Theatre of the Society of Arts (by kind permission of the Council) on Monday and Tuesday, April 23 and 24, under the presidency of Captain W. de W. Abney, C.B., R.E., D.C.L., F.R.S., P.R.A.S. On Monday, April 23, at three p.m., the President will open the Conference at the Society of Arts, and papers will be read from three to six p.m. At eight p.m. the Conference will be continued, and papers will be read from eight to ten p.m. On Tuesday, April 24, at three p.m., the Conference will be renewed at the Society of Arts, and papers will be read from three to six p.m. In the evening a Lantern-slide Exhibition will be given in the Theatre of the Society of Arts, for which special tickets will be required. On Wednesday, April 25, at half-past seven p.m., the Annual Dinner for members and friends will be held. The Members' Annual Exhibition of Photographs will be commenced at the Club on the first day of the Conference. A complete programme will be issued later and distributed. Visitors are cordially invited to attend and take part in the discussions at the Society of Arts.

PHOTOGRAPHIC TRADE SECTION OF THE LONDON CHAMBER OF COMMERCE.—A meeting of this body was held at the offices of the Chamber of Commerce, Botolph House, Eastcheap, on Tuesday, the 13th inst., at three p.m., Mr. W. S. Bird in the chair. Mr. Frank Bishop (Messrs. Marion & Co.) reported that the circular adopted at the last meeting of the Section held on the 8th ult. (announcing the formation of the Photographic Copyright Union, as a means of protection to photographers against the unauthorised reproduction by the illustrated press and others of copyright photographs, and asking the assent of the trade and profession to a proposal to impose a minimum charge of 10*s.* 6*d.* for the right to reproduce a copyright photograph for one issue only), has been sent to all the photographers of the United Kingdom, and that nearly 700 replies had been received, expressing willingness to join the Union and to agree to the above proposal. The majority of the trade were, therefore, in favour of the proposed change, which was regarded as very satisfactory. The question of the Antwerp International Exhibition, 1894, was brought prominently before the meeting, with a view to inducing the members of the Section and photographers generally to exhibit, either individually or in a collective capacity. It was stated that the Exhibition was a very promising one, as Antwerp was an important seaport, visited by merchants and all classes from all parts of the Continent, and within easy reach of England; that the duties in Belgium were low; that it was under royal patronage; and that a joint committee, representing the Mansion House and the London Chamber of Commerce, was acting in London in the interests of the British Section. After some discussion, it was agreed to send a circular letter to the members of the Section and the leading photographers, with a view to organizing a joint exhibit, if desired. Attention was directed to a recent explosion of a gas cylinder at Bradford, and to the fact that supervision of the manufacture of these cylinders was desirable, in order that steps might be taken to see that the cylinders were duly tested to prove they were able to stand the requisite pressure. After considerable discussion, it was agreed that it was desirable a friendly conference with the makers and users of gas cylinders be held, in order to ascertain what, if any, steps could be taken to ensure perfect safety in their use, and arrangements were made for holding this conference at the offices of the London Chamber of Commerce on Friday, the 23rd inst., at four p.m.

LORD RAYLEIGH ON REFLECTION AND REFRACTION.—In his second lecture on *Light*, delivered at the Royal Institution on Saturday last, Lord Rayleigh pointed out that partial reflection was not wholly due to the fact that light was passing from one medium to another, but that it passed suddenly and abruptly. So-called total reflection did not depend upon suddenness of transition, and therefore it was a wholly distinct phenomenon. A mirage gave an example, for what looked like the appearance of water on broad and hot sandy places was due to the fact that close upon the ground there lay a spectrum of rarefied air. A ray of light fell very obliquely on to it, and, being totally reflected, reached the eye of an observer much as if the reflection took place from a body of water. The phenomenon was, strictly speaking, one of refraction, although the effect was the same as if there were complete reflection on one surface. He mentioned this because he did not think it was to be found in any of the books on optics, and because, from a theoretical point of view, it was of great importance. Just as a glass lens formed an image on the screen, so the crystalline lens of the eye formed an image of external objects upon the retina (the sensitive surface at the back of the eye), and so the image on the retina was inverted. Much unnecessary speculation had been made in this connexion, for people supposed that because of this inversion it was a mystery that we did not see everything upside down. The fact was, we did not see

the image on the retina at all, we only felt it, but, if we could see the image on somebody else's retina, then we should see it inverted. Muscles of the eye varied the power of the lenses by squeezing them about, but when age came on this power was often lost, and so spectacles had to do the work. The application of spectacles was one of the greatest benefits which had ever been conferred upon mankind. It was ascertained a good deal before Newton's time that, under certain circumstances, light became coloured by refraction, and it seemed extraordinary that there could ever have been any misunderstanding as to the precise origin of the colour. When Newton made his magnificent experiments upon refraction, and showed that the law had to be stated separately and independently for every kind of coloured light into which the white light might be decomposed, some of his contemporaries regarded his statements with the utmost scepticism. Many had denied that Newton used the slit form of directing a ray of light on to the prism. The reason why this error had been so widespread and persistent was that they did not understand how Newton could have used the slit, and yet not have discovered Fraunhofer's lines on the spectrum; but, judging from a very limited experience as a discoverer, the lecturer said he could almost understand that, if Newton had found the lines, he would rather have put them from him impatiently as a complication interfering with his main point, and then possibly the circumstance would afterwards have passed out of his mind.

Our Editorial Table.

The Blue Book of (American) Amateur Photographers.

This work, which is compiled by Walter Strange, Beach Bluff, Mass., U.S.A., forms one of the most admirable books of society reference conceivable. In addition to giving a compendious list of photographic societies, their officers, and, so far as America is concerned, their members (the *raison-d'être* of the book), it contains much general information respecting postal matters, American patent law, international and local copyright, passports, and other matters of interest to photographers. It is copiously illustrated by photographs of places of interest. From an advertisement in the book we observe that a similar Blue Book devoted to British Societies either has been or is to be issued.

Wynne's Infallible Exposure Meter.

The original slide-rule form of this meter has now developed into the form of a handsome watch or pocket compass, a decided improvement on the former one. Photographers like simplicity in actinometers, and here they have got it, not, so far as we can discover, at the expense of any of the good properties possessed by the other. It bids fair to become highly popular.

Mawson & Swan's Novelties.

We have received from Messrs. Mawson & Swan several price-lists and other descriptive literature relating to their manufactures, together with samples of their films and plates. Concerning these we shall very soon have occasion to speak at some length. Incidentally, we may at present remark that in the catalogues referred to is one specially devoted to appliances and chemicals for photo-mechanical printing processes, such as photo-lithography, photogravure, collotype, Woodburytype, photo-zincography, &c.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3064.—"Photographic Films and Apparatus for Changing same." A. C. Smith and A. A. Smith.—*Dated February*, 1894.

No. 3121.—"A Process for the Reproduction of Objects, either in Relief or in Intaglio, with the Aid of Photography." M. Russo and G. B. Zanardo.—*Dated February*, 1894.

No. 3140.—"Improvements in Photographic Cameras." J. Gage.—*Dated February*, 1894.

No. 3143.—"Improvements in Photographic Printing Frames." W. Middlemiss.—*Dated February*, 1894.

No. 3148.—"Improvements in a Combined Photographic Printing and Vignetting Frame." Marion & Co.—*Dated February*, 1894.

No. 3367.—"Improvements in Photographic Cameras." R. L. Decaux.—*Dated February*, 1894.

No. 3477.—"Improvements in the Manufacture of Photographic Plates." Communicated by the Chemische Fabrik auf Actien vorm. E. Schering, Germany. A. Zimmermann.—*Dated February*, 1894.

Improvements in Photographic Cameras and their Accessories.

No. 5828. William James Lancaster, Colemore-row, Birmingham.—*January 20, 1894.*

This invention relates to detail improvements in photographic cameras, and in accessories of them, such, for example, as dark slides, plate-carriers, and stand attachments, and which said invention is an improvement or improvements upon three several Letters Patent granted to me, and bearing date the 1st day of May, 1885, No. 5364; the 1st day of February, 1887, No. 1533; and the 30th day of January, 1889, No. 1631, as hereinbefore described.

My said improvements consist, in the first part, in the construction, mounting and fitting of the front of the camera with means whereby the said front admits of both vertical and swing adjustments, and also admits of taking certain positions most favourable for folding, without any of the parts employed in the said front becoming disconnected; in the second part, in mounting and fitting the back part in manner that the same admits of both a vertical and horizontal adjustment. or otherwise, of a vertical and angular slope adjustment; in the third part, in the means of connecting the table of the stand to the baseboard of the camera, whereby the single connexion pin, as commonly employed, is dispensed with, and a more even distribution of the weight of the camera secured; in the fourth part, in the construction and production of dark slides; and, in the fifth part, in plate-carriers having closure mouth entrances.

In carrying out the first part of my invention, I mount upon the front part of the inner tailboard, which works telescopically within the outer frame part forming the edges of the baseboard, an upright and rocking bracket, pivoted at its extreme lower part to the extreme outer ends of the inner tailboard. This bracket has upright slotted or branched members disposed at distances apart from each other, equal to the breadth of the front of the camera, which has pins or fulcra disposed at the two opposite sides of it, a little above the middle, so as to admit of the said front hanging vertically or swinging when hung from the said pins, which also act as means for clamping the said front in any vertically adjusted position.

The upright branches of the bracket have upper and lower slots, separated from each other by solid parts, which carry necks or centres, wherein clamping pins taking through the slots of set-back rocking brackets or arms take. These rocking brackets are angularly disposed relative to the first-named upright brackets, and are joined to an inward front part of the inner tailboard, and pass in such a direction that their axes pass transversely through the pins or necks carried by the solid parts dividing the slots as aforesaid.

Vertical adjustment is performed by loosening the screws on the axes passing through the upper slots in the first-named bracket, and then sliding the front to any desired vertical position.

The lower outside edges of the said front have outstanding pins or studs, which work within the lower slots of the arms of the front bracket, and which lower slots have gates or entrances at their upper ends, to admit of the said lower pins or studs leaving the said lower slots, in order that the front may turn upon the upper pins as centres of motion for folding.

Assuming that the parts are in positions for use, and the said parts adjusted to the desired tilt and elevation, then screw home the clamping means, when the parts are rigidly held in the desired and adjusted positions.

To fold the front to the plane of the baseboard, release the screws, lift the front to its full extent, and pass the lower pins outwardly through the gates. Then swing the front upon the upper pins, when the same can be folded, and the whole of the parts lie flat to the baseboard, without the removal or detachment of any of the fittings or parts.

In carrying out the second part of my invention, the back of the camera is mounted upon a slide or rest bracket, which traverses upon the outer tailboard as a bed, and which slide carries a clamping device, which when released admits of the front making a swing adjustment, but when screwed home clamps the back in any adjusted angular position.

The ends of the slides have horizontal slots formed or cut within upright parts of them, so as to admit of the said back making a skew adjustment, or, in other words, admitting the said back, when adjusted to any inclination, turning in a plane at an angle to the plane of itself.

The lower outer ends of the said back carry pins passing through the said slots, and with milled heads or nuts taking upon the ends of the said pins.

Stay brackets are also fitted to the sides of the said back, with the inner ends of them jointedly connected to the outside edges of the outer tailboard, and with clamping pins upon the middle edges of the back frame taking through longitudinal slots formed in the upper parts of the said brackets.

Assuming the required traverse and angular adjustments have been made by sliding the said back upon the baseboard or outer tail part, then the same are affixed by the screwing up of their respective screw nuts, and assuming that, before such adjustments have been clamped, the necessary skew adjustment has been obtained, by turning the said back, as it were, upon its own vertical axis, then the whole of the parts are collectively clamped in the desired adjusted position.

In carrying out the third part of my invention, the connexion of the baseboard with the table of the stand is effected by a means consisting of the one part of a flat ring, having headed studs which stand up for its top side or face, and which are adapted to take through enlarged ended holes formed at one of the terminations of the slots of a second part or plate, affixed to the base board.

Thus the baseboard carries a ring having enlarged ended slots, whilst the table stand, or the ring of the table stand, has an upright flange of an outside diameter equal to the inside diameter of the baseboard ring, which forms a lead for the placing of the baseboard of the stand, which is supported and carried by legs, as usual.

In connecting or placing the camera to or upon the stand, bring the enlarged ends of the plate of the baseboard coincident with the studs, then place the said enlarged ends vertically over the heads of them, until the opposed faces of the two parts to be connected come together. Then slightly rotate the camera and turn a clamping lever, which draws and clamps the two plates together in any position, as may be desired, other than at points where enlarged ende are.

In carrying out the fourth part of my invention, the dark slide consists of

an open-topped, rectangular-shaped frame, made from moulding drawn from sheet metal, and which open top is closed by a hinged top, with the joint end cranked, and the other end fitted with a catch fastener. The moulding constituting the framing is provided with grooves or guides adjacent to the two opposite edges, wherein sheet metal or other slides slip, and are made light-tight by the walls of the said grooves falling slightly to the boundary edges of the slides embraced. The upper ends of the slides extend beyond the top edges of the framing, and are provided with thumb-pull pieces, made lip form, which, when in position in the frame, come non-coincident.

The closure top is like unto a bar coming between the upper parts of the slides, and is made taper, and fitted with velvet or other light-tightening material, which closes the seams or opposed edges, and prevents the ingress of light to the plates, which slide within a central groove or grooves formed between the slides of the grooves.

The moulding is made from thin sheet metal drawn with border grooves or channels, or with grooves or channels disposed adjacent to the two opposite edges of the section moulding, and with a broader and shallower groove or channel coming between the edge grooves. Thus the inside section of the said moulding is that of three grooves, the outer ones for receiving the slides, and the inner one for receiving the plate or plates.

The moulding may be made with two or other number of middle grooves arranged side by side with the said outer grooves. The outside section comprehends a middle groove located between two outside flanges. This outer groove fits into the guides in the camera back.

In carrying out the fifth part of my invention, the plate-carrier consists of a rectangular frame of all cross section, with the open part being presented inwards. The upper end of this frame has a turn-down and jointed top, with the ends extended crankwise downward to the joint, whilst the front of the said turn-down closure top part is open, and, when in its closed position, the top edge of it overlaps the top edge of the cut-way part of the top of the framing. When the hinged part is turned down, a mouth is presented wherethrough a plate is slipped, after which the same is retained in the carrier by turning up and closing the flap or hinged top, hence a frame enclosed on the whole of the outer sides.

In order to give lightness, the whole of the metallic fittings may be made of aluminium.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
26	Camera Club	5.30 p.m., Annual General Meeting. 8 p.m., *How the Camera can Help the Meteorologist.* Prof. G. J. Symons.
26	Lantern Society	
26	North Middlesex	*Amateur Plate-making.* R. Child Bayley.
26	Putney	
26	Richmond	
27	Birmingham Photo. Society	
27	Great Britain (Technical)	*A Method of Modifying Platinum Prints by After-treatment.* A. W. Dollond.
27	Hackney	*Ireland.* F. W. Hindley.
27	Halifax Camera Club	
27	Lancaster	
27	Leith	
27	Newcastle-on-Tyne & N. Counties	Conversational and Lantern Meeting.
27	Paisley	
27	Rochester	
27	Warrington	
27	West London	*Eastward Bound.* F. T. Lewis.
28	Ashton-under-Lyne	*Paget Lantern Slides and Print-out Papers.* S. Herbert Fry.
28	Bath	
28	Burnley	
28	Leytonstone	*Colour.* A. P. Wire.
28	Liverpool Amateur	Smoking Concert.
28	Photographic Club	*Lantern Matters.* Monthly Lantern Meeting.
28	Southport	
28	Stockport	
March.		
1	Birmingham Photo. Society	
1	Camera Club	*Light Waves in a Shadow.* W. B. Crofts, M.A.
1	Dundee and East of Scotland	
1	Ealing	Lantern Evening.
1	Glasgow Photo. Association	
1	Glossop Dale	
1	Hull	
1	Leeds Camera Club	Discussion: *Developers.* Opened by W. R. Irwin.
1	Leeds Photo. Society	Members' Lantern Evening.
1	Liverpool Amateur	*To Dixies Land and Back.* D. Cunningham.
1	London and Provincial	
1	Oldham	
1	Tunbridge Wells	
1	Woodford	*Masking and Binding Lantern Slides.*
2	Brighton and Sussex	
2	Cardiff	
2	Central Photographic Club	
2	Croydon Microscopical	
2	Holborn	
2	Leamington	
2	Lewisham	
2	Maidstone	B. Davidson.
2	North Kent	
3	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 15,—Mr. Hodd in the chair.

In reply to a question, Mr. J. S. TEAPE spoke favourably of the Hill Norris collodion lantern plates, saying that he had found them very quick, and that density was easily obtainable with them.

The remainder of the meeting was occupied in a discussion initiated by Mr. E. H. Bayston, on Saturday afternoon outings, the general opinion being that they were not numerically successful. In the end it was decided to abandon official Saturday afternoon outings during the coming season, but to give members facilities for forming small parties as occasion arose.

PHOTOGRAPHIC CLUB.

FEBRUARY 14,—Mr. F. A. Bridge in the chair.

Mr. G. W. Tottem showed a film negative storage album having an index and numbered pockets.

The HON. SEC. asked members to contribute framed photographs for hanging in the club-room.

Mr. Taylor (of Messrs. Taylor & Green) showed an electric lamp for the dark room worked by an accumulator. The lamp could be detached and fixed in the buttonhole of one's coat. It had a ruby cap fitted to it. It burned for eight hours; six volts pressure was required. Grove primary batteries were supplied if desired.

A practical demonstration of the Autocopyist was given. Particulars have already been published.

In the course of a discussion which followed Mr. FOXLEE said he thought distortion would result from using parchment paper stretched wet, as it did not expand equally.

The CHAIRMAN said the paper would give distortion in portrait work.

Mr. TAYLOR (who gave the demonstration) said he had not noticed distortion occur in portrait work. The negatives used must have plenty of detail.

Votes of thanks concluded the proceedings.

Central Photographic Club.—February 14, Mr. E. J. Wall in the chair.—A paper (which we print elsewhere) was read by Mr. Alfred Watkins, of Hereford, entitled *A Method and Instrument for Timing Development.* Mr. JOHN STERRY doubted whether the system was applicable to all makes of plates, or when the newer developers—which flash up, but require a longer comparative time to obtain the necessary density—were used. Mr. TEAPE remarked that judgment and eyesight had to be exercised to ascertain the first appearance of the image. Mr. LAWRENCE thought the use of the term "development factor" unfortunate, as Messrs. Hurter & Driffield had already employed it in another sense. Mr. OAKDEN suggested that the results adduced by the lecturer should be verified by practical work in the field. Mr. ROBERT BECKETT considered the lecture opened up a new field of investigation. If the method was right, it would save a great deal of time, trouble, and difficulty in getting plates of one printing density, and, further, we should be able to do with less light in development when using isochromatic or plates of very high sensitiveness. The CHAIRMAN considered the method a valuable one, and, with regard to the influence of bromide, he pointed out Mr. Cadett had given a formula for development without any bromide to increase the speed. Mr. Watkins, in replying, said he had taken the Club early into his confidence; the instrument shown would probably not be the one to be placed on the market later. The majority of the tests had been corroborated by exposures on landscape subjects. In architectural subjects, one of the half-tones would have to be selected as the starting-point.

FEBRUARY 16, Mr. Lloyd in the chair.—Mr. D. S. BREARLEY delivered a lecture on *Japan*, illustrated by upwards of ninety slides coloured by native artists. The lecturer, after mentioning the two drawbacks—earthquakes and typhoons—referred to the routes taken by travellers in going out to visit Japan, viz., Canada, the United States, and the Suez Canal. He then described the country as it existed when the two-sworded Samurai stalked arrogantly through the land, trying the temper of their blades on any unoffending animal that appeared within their reach, or causing the head of some miserable pleading beggar to roll into the dust. He then dwelt on the changes that have taken place in the empire since the admission of foreigners, so much having been completely modernised that recent tourists are somewhat disappointed with the change. Describing the Japanese themselves, the lecturer said that the men are not handsome, owing to their small stature and sallow complexion; and, as to the women, it is matter of opinion whether they are pretty, though many look very captivating when nicely dressed. His reference to the ubiquitous tea-house, where the delicious golden liquid, with its usual adjuncts of cakes and sweetmeats of every hue and colour, served in neat lilliputian cups of pretty porcelain on tiny trays or stands by gushing damsels, whose simple manners and winning ways are almost as refreshing as the beverage they so charmingly dispense from mignon teapots, fit for fairies or for dolls, caused considerable amusement. Mr. Brearley described the Japanese as a polite, amiable, and hospitable people, not at all truthful, but thinking it more kind and friendly to tell a lie than communicate an unpleasant truth. The architecture of their houses, their frequent fires, the indispensable *hibachi*, the trellised or open fronts of their dwellings, their curios, amusements, pastimes, and general characteristics, not omitting their religions, and many temples, pilgrims, mendicants, priests, street musicians, flower and plant-sellers, religious festivals, all in turn came in for description. The slides, particularly the figure studies, of which there were a considerable number, were much admired, as superior to any similar work executed in England.

East London Photographic Society.—February 13, Mr. E. Stone in the chair.—Mr. G. OVERY showed and described about sixty slides, illustrative of a *Tour through North Wales with Cycle and Camera.* The subjects were of a varied and interesting character; the many curious and beautiful prints of architecture shown proved the route taken to be one very prolific in this branch of photography. The Dee Bridge, Miners' Bridge, and Conway Castle were of specially good merit and evoked general approbation from the audience

for their suitable tone and artistic rendering. A visitor (Mr. Clements) also exhibited some two dozen slides of views in and around the Isle of Man from negatives taken with a hand camera. The Assistant Secretary, also showed some slides, which, whilst of artistic merit, were considered too dense.

Hackney Photographic Society.—February 13, Mr. R. Beckett in the chair.—The Hon. Secretary showed prints on Hezekiel's print-out platinum paper, Horne's cheap double dark slides, and Arundel and Marshall's box for lantern plates. Samples of Imperial "Kloro" paper were distributed among the members. Mr. T. H. Smith, to illustrate the good covering power of a cheap quarter-plate rapid rectilinear lens which he possessed, showed a half-plate negative taken by the same, and of which all but the corners was sharp. He also showed some excellent negatives on medium Iso plates. The subjects were coloured pictorial advertisements, and the relative values of the respective colours were well rendered. Messrs. Puttock, Wire, and Norris showed work on matt P.O.P. Mr. J. H. AVERY then read a paper on *Architectural Photography*, and treated his subject in a masterly style. Apart from the most instructive observations on the subject-matter, Mr. Avery's paper teemed with valuable suggestions applicable to other branches of photography—hints on backing plates, exposure, development, &c., being given. Mr. Avery, in his paper, spoke of the great use of photography in recording architecture, and its great superiority over drawings for this purpose. There could be no finer branch of photography than architectural work, which, too, fitted better with its limitations, for nothing was required beyond mere technical skill, whereas, for landscape work, much more—a knowledge of art—was necessary. The camera should be of fair size, not less than whole-plate, while a 10×12 was best; it should be firm and have all movements, a rising and cross front as long as possible, bellows square or but slightly tapering, swing back working from centre. The spirit or plumb levels should be fitted, taking care that they had rapid movements. The focussing screen should be ruled with parallel lines both ways to facilitate arranging rectilinear subjects. The tripod should be large and firm, and be provided with pieces of cloth to the feet to prevent slipping on stone or other smooth hard surfaces. Of lenses, wide-angle symmetricals were best. Several were desirable, with foci of, respectively, five, seven, and nine inches for whole-plate, other sizes in proportion. Expensive lenses, however, were not absolutely necessary. In his own work, Mr. Avery had used with success a half-plate rapid rectilinear lens of nine inches focus. This was attached to the camera with an extra tube extension, and, when stopped down, covered sharply a 10×9 plate. As wide-angle lenses lengthened focus considerably when stopped down, it was necessary, when using them, to focus, if possible, with the diaphragm aperture intended for use. He preferred a plate of medium rapidity for general use, but extra rapids were useful on some occasions. The plate should be backed. For this purpose caramel was undoubtedly best, but had the disadvantage of being "messy." The backing used by Mr. Avery was an orange-stained collodion sold for the purpose by Mawson & Swan. It was easily applied, dried rapidly, and could be quickly removed either before or after development. In effect, he found it to be nearly as good as caramel. Backed plates allowed twenty per cent. more exposure to be given than did unbacked ones. When photographing a subject in which halation was expected, very full exposure should be given, in order that no forcing might be necessary on development. Forcing a plate always exaggerated halation when present. In photographing interiors, a lens of longest focus possible under the circumstances should be used, and the rules of perspective carefully regarded. Views should be taken from the ground line, otherwise distortion in perspective might result. In churches and other public buildings, where people were constantly moving about, it was best to give a long exposure with small stop, to prevent moving objects showing on plate. In a full-length interior the photograph should be taken from a point of view a little to one side of the centre. Good work might be done in domestic interiors if care were taken. The furniture in rooms might be arranged with regard to effect, but at the same time the general appearance of the room should not be altered too much. It was necessary to see that there were no reflections from glazed picture-frames; if so, slightly tilting them to one side would obviate that.

Leytonstone Camera Club.—February 24, Mr. A. P. Wire in the chair.—Mrs. CATHERINE WEED WARD gave a lantern entertainment, entitled, *In the Field and Studio.* The event being set apart as a special Ladies' Night, there was a good attendance of the fair sex. A very large number of slides was put through, embracing most of the notable objects of interest in the North of England and Scotland, those taken by Mrs. Ward during the Edinburgh Convention being particularly interesting, followed by American views and concluding with some portraits and figure studies. Some of the latter must have involved a lot of forethought and premeditation and no end of expense, some of the tableau scenes being particularly fine.

Richmond Camera Club.—February 12.—Mr. Taylor showed a large collection of views in County Wicklow, and Mr. Huddy a series of prints, on P.O.P., matt, and ordinary (squeegeed on glass) from the same negatives. Mr. BERKELEY opened a discussion on *Dark-room Appliances*, touching upon lamps, sinks, rockers, &c. He showed a lamp of his own construction, lighted by two paraffin burners, and transmitting an abundance of safe light through a screen consisting of three thicknesses of vaselined orange paper between two sheets of glass. Mr. GIBSON manufactured a dark-room lamp by knocking a hole in the bottom of a hock bottle and placing the bottle over a candle, but stated that a round-wick lamp was better than a candle for the purpose. Mr. TAYLOR described a washer of his own invention, consisting of a long wooden trough divided by galvanised wire and perforated zinc into a number of compartments, each taking a print, the water flowing in at one end and out at the other. Mr. Cembrano showed an adjustable cutting shape for lantern-slide masks and other useful accessories.

Woodford Photographic Society.—February 15, the President, Mr. H. Wilmer, in the chair.—The PRESIDENT, in concluding the discussion on *Estimating Exposures*, said that the researches of Messrs. Hurter & Driffield had taught the immense importance of correct exposure in the production of a perfect negative. The four variable factors in exposure were the rapidity of the lens and plate, the intensity of the light, and the character of the subject. If it were possible to measure these, it would be a very easy matter to expose correctly. The speed of the plate and rapidity of the lens are both capable of exact measurement, and an exposure meter, such as Watkins', can also gauge the light with very fair accuracy, leaving only the subject to the judgment of the worker. The chair was then taken by Mr. E. B. Caird, for the President to give his paper and demonstration of *Carbon Printing.* The absence of any visible image renders the employment of an actinometer an absolute necessity for which he recommended the use of a good standard brand of albumenised paper, which should be kept absolutely dry. The character or vigour of the print can be modified by the strength of sensitising bath, the length of immersion, and the character of the light in which it is printed, a weak sensitising bath, or a short immersion, giving a stronger image, this enabling those who sensitise their own tissue to suit individual negatives, and, consequently exercise very considerable control over their results. He said that the continuating action of light, which is such a feature of this process, is accelerated by heat and damp, and arrested by dryness, the recently published experiments of Mr. Foxlee being given in detail and the results shown. For glass transparencies a substratum is necessary, consisting of gelatine 1 ounce, water 20 ounces; when dissolved, add 12 grains chrome alum in 1 ounce of water very gradually. He then showed the method of sensitising the tissue, the stripping of previously mounted double transfer prints, and the development of single transfer prints on opal, glass (for transparency), toned etching paper, and the single transfer paper of the Autotype Company, and, in concluding, spoke of the range of colours and variety of effect possible with the unquestionably permanency of the process.

Ipswich Photographic Society.—February 13, Annual Meeting.—The officers were re-elected, with the addition of Mr. F. Woolnough (Curator, Ipswich Museum) as Vice-President, and Messrs. Sutton and Brown as Committeemen. Mr. J. C. Wiggin was elected Hon. Secretary in place of Mr. A. F. Pearson (resigned). A vote of thanks was passed to the late Secretary for his services, and especially for his generosity in providing refreshments &c. at the late *conversazione.* Three new members were elected. Mr. Woolnough intimated that he had refurnished the Society's dark room at the Museum, and that any member (or tourist) could have the key on application at the Museum.

Newcastle-on-Tyne and Northern Counties Photographic Association.—February 13, Mr. J. P. Gibson (President) in the chair.—Before the largest muster of members on record, Mr. S. HERBERT FRY demonstrated the Paget Company's process of developing a partially printed-out image upon their paper. The operations of bromising, developing, toning, and fixing were lucidly described and demonstrated, and a large collection of beautiful examples of the process were passed round. Lantern slides on Paget plate were also shown.

Glasgow and West of Scotland Amateur Photographic Association.—February 19.—Four new members were elected. Mr. W. I. CHADWICK, of Manchester, lectured on *Photo-micrography*, and showed results both as enlargements and as lantern slides. He also discoursed on lantern optics, showing the advantages of triple condensers, and showed a variety of beautiful experiments with the lantern polariscope and lantern kaleidoscope.

Kilmarnock Amateur Photographic Society.—February 16, Mr. Thomas Ferguson (President) in the chair.—Messrs. G. Paxton and J. Thomson respectively gave very successful demonstrations with platinotope and Alpha papers. Mr. Paxton showed his album, containing very fine platinotype prints of the most remarkable trees in Ayrshire. Mr. Robert Terras, 42 Sandgate-street, Ayr, very kindly sent splendidly finished specimens of platinotype prints, some of them taken from 15×12 plates.

FORTHCOMING EXHIBITIONS.

1894.	
February–March.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
March 26–28	*Exeter Amateur Photographic Society. Hon. Secretary Rev. John Sparshatt, Fairfield House, Alphington road, Exeter.
April 18–28	*Newcastle-on-Tyne International. Hon. Secretaries Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth street, New York.

* Signifies that there are open classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TONING PLATINUM PRINTS.

To the EDITOR.

SIR,—With reference to a letter in your issue of February 9, by R. I Mercer, detailing his failure to tone with the formula given on page 7(of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, the process, in n hands, is simplicity itself. Results have been shown to many, who ha given a favourable opinion of it. I cannot detect in the letter by M Mercer any reason for his failure; yet, when he says he cannot g beyond a dirty yellow, I have a suspicion that his chemicals are inferior quality, if he has obtained the right ones.

He says that he obtained no precipitate when mixed well. So muc the better. I have always had a precipitate of uranium ferrocyani

which is insoluble in water. Then he thinks he may have used too much acid. He has not if he adhered to the formula, and a little more will do no harm. The acid prevents the paper from being discoloured to such an extent as it would be without it. I believe it was Dr. Vogel who, about ten years or more ago, recommended the addition of acetic acid to the uranium intensifier, as it prevented it attacking or discolouring the gelatine.

The formula for toning platinum prints is really the old uranium intensifier, and has been used also for toning lantern slides, transparencies, and bromide prints.

I may mention a circumstance which occurred to me about three weeks ago, as it will, perhaps, give Mr. Mercer a clue to his failure. The weather was cold, and I put a print to tone; finding it toned very slowly, I let it remain, and it required four hours to get the tone. This I attributed to the low temperature. No doubt he is aware that chemical action is affected by temperature.

I expect to show some prints at the London and Provincial Photographic Association on March 1, when, if Mr. Mercer can pay a visit there, he will see the tones which have been obtained by this method. I can only advise Mr. Mercer to try again.—I am, yours, &c.,

London, February 19, 1894. J. S. Teape.

"NEW HOT WATER FILTER."

To the Editor.

Sir,—I have just read the paragraph under the above heading, and it strikes me that I have "home" made, and been using for the last two years, a more simple apparatus. It may be worth describing. It consists of an iron tripod, supporting an old round tin case, with a movable lid—I don't know what came in it to the household originally—large enough to take a Devonshire cream pot, with a glass funnel on top. All this over a single-burner petroleum lamp, the top of the chimney of which is just about half an inch under the tin. I have used it principally for filtering gelatine, with a small proportion of glycerine in it. The tin has sufficient water poured into it to surround the cream pot and glass funnel on top without floating it, when the last is filled with melted gelatine and glycerine. The neck of the funnel has a plug of cotton-wool pushed into it, and is covered with a glass plate (a piece of an old negative glass). A piece of wood, fastened to the lid of the tin with a couple of French nails, and having a hole through wood and tin, the latter also covered with an old lantern-slide plate, completes the apparatus, and I have proved it completely effective. The water jacket is, of course, kept boiling by the lamp, and the object of the hole is to get at the cream pot, if desired, to stir it without removing the lid, of course only if necessary, when the covering glasses are not on or the upper temporarily removed.

I have been perfectly satisfied with the results and rapidity of the filter, although the latter somewhat depends upon the firmness or otherwise with which the wool is pushed into the neck of the funnel. I never use anything but wool, but, when any mixture contains methylated spirits, then half an inch of animal charcoal is put on top of the wool.

Greenhithe, February 17, 1894. W. T. F. M. Ingall.

THE INCANDESCENT GAS LIGHT.

To the Editor.

Sir,—Bearing directly on your leading article, February 9, and somewhat in reply to Mr. Thorneycroft's letter of this week, I venture to quote from your Journal dated April 13, 1893: "And Mr. C. F. Treble, of Clapham Junction, besides exhibiting some examples of portraiture by the Welsbach light, which show perfect tone rendering and freedom from harshness." To this criticism I would add that I have for the last two winters been using a studio fitted for gas-light work only, and have produced portraits in all sizes, from *carte-de-visite* to 12 × 15 (direct), and, as proof in these matters (as in pudding wolfing) is paramount, I will send a cabinet photograph (guaranteed by the incandescent gas lights) to any one interested in the matter.—I am, yours, &c.,

Charles F. Treble.

20, *Queen's-parade, Clapham Junction, S.W., February* 19, 1894.

To the Editor.

Sir,—I have read with much interest your article on "The Incandescent Gas Light" as applied to photography. This system has been employed with the greatest success by Mr. C. F. Treble, Clapham Junction, who devised an arrangement whereby he can, with seventeen incandescent gas burners, obtain results equal to daylight pictures. Unfortunately we have not had time to devote our attention to this branch of business, but next autumn we intend to bring it forward, and have no doubt that its simplicity and efficiency, combined with small cost, will lead to its general adoption.

As to the colour of the light being unpleasant for domestic purposes, this can easily be obviated by the employment of coloured chimneys or globes.—I am, yours, &c., L. de Fonblanque,

Secretary of the Incandescent Gas Light Company, Ltd.,

14 *Palmer-street, Westminster, London, S.W., February* 17, 1894.

EXPOSING DEVELOPED (?) PLATES.

To the Editor.

Sir,—In reply to S. E. Kelf's letter *re* Exposing Developed (?) Plates, will you allow me to state:—

Firstly.—I am not responsible for the heading to my letter in the Journal of the 9th inst., over which he waxes sarcastic. The wording of it is yours, and not mine.

Secondly.—What I wished your readers to learn from my rough-and-ready experiment was, that, if they at any time happened to pour developer over an unexposed plate, the plate was not necessarily spoilt, but could, with little trouble and ordinary care, be made to yield a good negative. This fact was probably not new to many of your readers; but I suppose there are one or two, besides myself, who had not tried the experiment before, and it was for their benefit I wrote.

Thirdly.—If I were inclined to be hypercritical, like my friend, I should ask him the following question:—When he "took out the unexposed plate and developed it—developed it carefully," what was it he developed? He says himself that no image came up. Then, *what* did he develop? Perhaps he will kindly inform your readers what else, besides an image, *can* be developed on a photographic plate—unless it be pinholes?

But this is mere quibbling, Mr. Editor, and I have only indulged in it to let my fellow-correspondent see that he should be a little more exact in his own phraseology if he intends to set himself up as a censor of that of other people's.—I am, yours, &c., John Cummings.

21, *Mill-street, Alloa.*

A RECENT PATENT.

To the Editor.

Sir,—I notice, in your issue of January 19, that Messrs. André & Sleigh have obtained a patent for "Improvements in or relating to Photo-mechanical Printing." It appears that their invention is "the employment of screens for the production of intaglio plates."

I venture to point out that there is nothing new in this. In Professor W. K. Burton's *Guide to Photographic and Photo-mechanical Printing Processes* the following passage occurs:—

"Before describing any processes used exclusively for the production of half-tone intaglio plates, I should mention that every process used for obtaining half-tone in type blocks has probably been at one time or another applied to the production of intaglio copper plates, and that at the time the Meisenbach principle is used for the purpose. The writer has seen very successful prints from copper plates, in which the grain was produced by this process, made by Mr. E. Edwards."

The book from which I quote is dated in 1887.

I take the liberty, therefore, of questioning the validity of the patent, believing that it gives the patentees no power to prevent the continued use of the process by those who have previously employed it; in which case it follows, of course, that any one who wishes to make use of it now may do so without any infringement of patent rights.

It may be worth while to point out that this method of photo-engraving has not produced, and is not likely to produce, such fine results as the Klic and other methods of photogravure. This, however, does not affect the question immediately at issue, which is, in a word, "Is a new patent of an old invention valid?"—I am, yours, &c., Walter White.

70, *Shirland-gardens, W., February* 19, 1894.

WOOLWICH PHOTOGRAPHIC SOCIETY.—A CORRECTION.

To the Editor.

Sir,—We should like to point out that the Photographic Exhibition recently held at Woolwich was organized by the Woolwich Polytechnic Photographic Society, and not by the Woolwich Photographic Society, as reported in your last impression. The same slip occurred in the preliminary announcements. The surprise is, that the people chiefly concerned have not put this right.

Although the Woolwich Photographic Society is in a prosperous condition, yet we have not held an Exhibition. These things are catching, however, and it is quite possible that we may have one this year. In that case, the confusion of names might adversely affect our interests.—I am, yours, &c., J. Borthwick Panting,

February 19, 1894. *Hon. Secretary Woolwich Photographic Society.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

RECEIVED.—*Results of Meteorological and Magnetical Observations at Stonyhurst College Observatory*, 1893. Compiled by the Rev. W. Sidgreaves, S.I., F.R.A.S.

*** Several answers to correspondents unavoidably held over.

FILM.—We cannot say when the films in question will be on the market.

FRIAR JOHN.—Mr. Warnerke's address is, Silverhowe, Champion Hill, S.E.

H. T. B., who wrote regarding a second-hand studio on wheels, is requested to send us his address.

E. MILLHOUSE.—It is our opinion that the unevenness of density may have arisen from inequality of coating.

PROOF WANTED.—All the remedies you mention having failed, we should advise you to take legal proceedings.

P. GRAM.—We believe all the movements you specify are protected by patent. You require the services of a patent agent.

TADROUS HANNA.—The address of this gentleman is required by Mr. F. Collins, Photographic Publisher, Clacton-on-Sea.

A. H. DUNNING.—"Sal soda" is sodium mono-carbonate, or washing soda. We do not know the address of Mr. Weatherwax.

T. B. PARKES, County Studio, Northampton, desires the address of The London Photographic Company, late of 304, Regent-street, W.

F. ARGALL.—Gunther Wagner's Transparent Albumen Colours were sold in this country by Mr. C. A. Rudowsky, Guildhall-chambers, E.C.

JAMES C. CHRISTIE.—Your best plan would be to secure an opportunity of trying the four lamps named. We cannot undertake to recommend one maker's goods in preference to another's.

ANXIOUS.—We recommend you to communicate with Mr. E. Howard Farmer, The Polytechnic, Regent-street. Facilities are there given for a complete course of studies in theoretical and practical photography.

H. C. W. BLYTH.—1. After printing, well wash and then alum, again well washing before toning. 2. The strength is immaterial, say, 1 : 20. Immerse for about five minutes. 3. Wash, if possible, in running water for ten minutes.

POSITIVE.—Bichromate of potash, 5 parts; hydrochloric acid, 5 parts; water, 100, would possibly answer. The strength is not very material. Images bleached in that way are presumably as permanent as others bleached with mercury.

ATHENÆUM and others who write *re* uranium toning, are referred to Mr. J. S. Teape's letter in the present number; also to Mr. J. Weir Brown's remarks before the Photographic Section of the Croydon Microscopical Society, page 91, February 9.

W. T.—Waxing and treating the glass plates are both efficacious in facilitating the stripping of the films. The latter method entails less trouble than the former, though some fancy the gloss is not quite so great as when the waxing system is adopted.

B.—We should think the articles you specify would answer your requirements very well—at the price. One plumb indicator should suffice. Brass binding is not imperative, except for tropical climates. For lantern-slide work Hodge's book will suit you.

F. P. C.—To do all you wish in such a studio would require more than one lens. You cannot do better than take the No. 2 of both the *carte* and cabinet series. You will then be able to take groups and full-length portraits, both on *carte* and cabinet plates.

B. WILLIAMS.—The old triplet lens is an excellent lens for copying purposes, and is much used by many who make this class of work a speciality. It is a slow lens as compared with some other forms, as its largest aperture is but about *f*-10, but, ratio for ratio, it is, practically, as quick as any other.

SELCINNUR.—The idea is that, as the sides of the prints which come together when mounted show a little more of the subject than the outside edges, the effect of looking into a hollow is obtained. The same effect is said to result from making transparencies with masks at nearer centres than the centres of the two views.

HAND CAMERA.—If it is imperative that the lens work at an aperture of *f*-6, and cover a quarter-plate sharp to the edges, a lens of four inches focus must not be expected to do it. If the dealer says it will, well and good, but have a guarantee that it will before parting with the money, and afterwards hold him to the bargain.

NIKO.—Judging by the speckled appearance of the larger print, we should say that the paper was sensitised on too weak a bath, and printed from too feeble a negative to yield rich tones. As the prints did not tone for twenty minutes, it is clear something was wrong with the bath or with the paper, or the way it was sensitised.

D. MC.—1. If the paraffin lamp be kept clean, the wicks in good order, and the lantern is properly constructed, there will be no smell from it. Also there should be sufficient light for a four-feet-six screen. 2. None of the London gas companies, or any provincial companies, supply coal gas compressed in cylinders. It will have to be obtained from those who supply compressed oxygen.

T. BENTON.—Any one knowing anything whatever of the collodion process would not be surprised at the result you obtained. By iron developer the ferrous oxalate is not meant, but the usual acid solution of sulphate of iron. As you have obtained Mawson's collodion, the formula for the developer will, we believe, be found on the label. Evidently you are mixing up the wet and dry processes together, and they have very little in common.

T. M. C.—If the cylinder, when you received it, was empty, it is clear either that the valve leaked, or that it was returned to you without being filled. As the gas was ordered through a local dealer, it will be of no use your writing to the company about it. They, of course, will not recognise you in the matter. It was, as you say, extremely annoying to have brought between one and two hundred people together, and then to find that the entertainment had to be abandoned.

PROVINCIAL says: "In my business I find I have to keep a horse and trap, and the Excise made a claim for a licence. I demurred, as the affair was necessary for my business, but they say it is used for the purposes of pleasure. Now, the only time it is ever used for such is on a Sunday, when I sometimes take my family for a drive. Is the claim legal?"—We fear the duty will have to be paid, as the horse and trap are not used exclusively for business purposes.

W. M. C. Writes: "I have two ferrotypes, the faces of which are varnished, and are covered with dust, which has become embedded on the varnish, and the likeness on each almost obliterated, at least unrecognisable. How can I remove the varnish so as to get a clear surface? I have tried methylated spirits and a gentle rubbing, but with bad results."—As the varnish is not soluble in alcohol, probably benzole will remove it; but, if the image *itself* has become obliterated, there is, we fear, but little chance of its being restored.

FRANK F. WEEKS.—1. No. 2. Although the copyright in a picture may have expired, a reproduction of the work may be copyright, but of course that will not prevent any one copying the original picture. 3 and 7. The Copyright Act may be obtained from Messrs. Eyre & Spottiswoode, the Queen's printers. We do not remember the exact price; it is but a few pence. 4. Nos. 5 and 6. Yes, you will have a copyright in your own work. We should very much doubt if "an inexpensive work on copyright" would pay any one to publish.

C. SIMPSON.—As an unobstructed north light can be obtained, and only a very broken up south one, we recommend the latter to be discarded altogether. Therefore, make the south side of the studio opaque, both top and side, and arrange to work from either end according to requirements. By this means the face can be lighted on either side just the same as if the studio had light on both sides. By all means utilise the full length at disposal. Twenty-seven feet is by no means too long for all-round professional work. If the north light only be adopted, nothing could well be better for the blinds than the fabric enclosed.

PHOTO-ENGRAVER.—The firm mentioned, like others that are the most successful, have not published their process, nor is it at all likely that they will. If they did, it would most likely be found that the excellence of their work is not so much due to the process as the skill with which it is carried out. It is scarcely to be expected that those who work processes commercially that they have perhaps spent years in perfecting will publish such details of the method as will enable any one with a little practice to compete with them. Your strictures are unreasonable.

T. A. C. says: "About a year or so ago you registered a photograph for me of a church. No copies were sold, and not one went out of the place for more than a week after the registration was acknowledged in the JOURNAL. I took the negative myself, and, no one assisted me, Now, one of the papers has copied the photograph, and, on my threatening proceedings, they simply say I can have no copyright in a picture of a church which any one can photograph."—Proceed at once against the paper for infringement of copyright. They will then find the case is different. Probably they know that already, but are trying a little "bounce"—a common commodity with some illustrated papers.

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ILLUSTRATED JOURNALISM.

At a recent meeting of the Society of Arts, Mr. Horace Townsend read a paper on the *Modern Development of Illustrated Journalism*. After detailing somewhat ambiguously the different methods of producing printing matrices, the author refers to "our innate English conservatism in art and business notions," and then, after extolling the great enterprise displayed by the press in America as compared with that of this country, proceeds to condemn the illustrations that appear in the English daily papers. It is true that he makes a generous exception in the case of the *Daily Graphic*, but qualifies it by adding, "I cannot help looking upon it rather as an illustrated weekly paper, which happens to be issued every day, than as a daily paper which is illustrated."

A great deal of the paper is taken up in lauding the *New York Herald*, and what it accomplishes, and the excellence of its illustrations. But are we really so very far behind America in the quality of our photo-mechanical work as Mr. Townsend would have us believe? It is true that many of the illustrations that appear in our evening papers are about as bad as anything that can be imagined; but are not many in the American papers equally as bad? On the other hand, are not the majority of the illustrations that appear in the higher class of journals of this country quite equal to any that are done on the other side of the Atlantic? The author speaks of an original sketch being made late at night, a process block produced therefrom, and the result appearing in the *New York Herald* on the following morning. We do the same; printing blocks are continuously being produced here at an hour or two's notice.

During the discussion following the paper, one gentleman, well acquainted with the subject, referring to the alleged excessive speed of production by the *New York Herald*, remarked that he could not see what the public required more than the events of each day illustrated next morning, and that was done here. With regard to the illustrations in the New York paper, he said he had the idea that most of them were done some days or weeks beforehand. No one having a practical knowledge of the business could possibly have any other opinion. In reply, Mr. Townsend frankly admitted that "the best articles in a paper were not those written at twelve o'clock at night, and the same with illustrations; a picture made a week ahead was just as much pictorial journalism as an article written at leisure was daily journalism." That discounts a great deal of the claim made for American expedition in the production of blocks over what is regularly done here.

Much was said on the subject of colour prints as illustrations in journals, and the high quality of those issued as supplements to the *New York Herald*, and the way they were produced, specimens of which were exhibited at the meeting. It was elicited during the discussion, however, that the blocks for them were made by a well-known firm in Paris, and that they were only printed in New York; also, that the same subjects had appeared in a French illustrated journal. This, again, discounts other claims put forth on behalf of the superiority of American over European work. With these facts before us, it will be seen that Europe is, after all, not so far behind America in the matter of periodical illustration as some would have us believe.

One very important point was dwelt upon by some of the speakers in the discussion, namely, the lack of art in the majority of the press illustrations, and it must be admitted there is much reason for complaint in this direction, not less in England than on the other side of the Atlantic. Many who make the sketches from which the printing blocks are produced have not the requisite artistic ability. They can successfully make sketches, and wash drawings, that suit the requirements of the makers very well, but they too frequently lack art. On the other hand, an untrained (for this special work) true artist might fail in his first essays to satisfy the block-makers. It may be urged that the drawings have often to be made at "high pressure," but it really takes no longer to produce an artistic drawing than it does to make one just the reverse. For example, Sir John Gilbert was cited, and the oft-told tale related that it was no uncommon thing for a wood block to be taken to him, and the messenger wait in the hall while the artist drew a picture upon it for the wood-engraver to cut. The speaker was right when he stated that, although the work was so rapidly done, it was at the same time as good as any in the world. Men like Gilbert are those who are wanted to make the original sketches for typographic blocks; from them we could have process blocks with really art qualities. As a matter of fact, the process block can only be a reproduction of what the draughtsman has supplied.

The absence of art in so many illustrations is, we imagine, explained in a remark made by the Chairman of the meeting —Mr. Joseph Pennell—that "an artist who draws for a daily paper was expected to accept a remuneration about equal to that of a penny-a-liner." That being the case, there is little to be surprised that the absence of art is so conspicuous in the illustrations to be seen in some papers. That greater excellence in art quality is desirable in press illustrations is unquestionable, but that this country is behind America in this or any other particular we decline to believe.

THE WET-COLLODION PROCESS.

XII. — Application to Lantern Slides.

It may, we think, be conceded as being fairly correct, if we say that nearly all the great wholesale manufacturers of lantern slides employ the wet-collodion process in their production. We content ourselves with noting this fact without seeking to institute invidious contrasts or comparisons between wet and dry, both of which have their partisans. One great distinguishing feature in their respective working may, however, be referred to: Whereas with dry plates the printing may be done either by contact with the negative in a printing frame or by the copying camera, the utilisation of the wet process demands the services of a camera. This latter statement must be taken with a certain amount of qualification, because, by interposing strips of card between the negative and the wet face of the collodion plate, so as to ensure their not touching each other, a picture possessing very great sharpness may be obtained. This could not be done when the two are separated unless the precaution were taken to avoid parallax, by causing the light to assume the form of a point, which can be readily done by admitting the light into the exposing room through a hole in an opaque window screen, or a like precaution being taken if a gas flame or other artificial illuminant be employed. We have tried the experiment of separating the negative from the sensitive plate to such a distance as to permit of a half-crown piece passing easily between them, and exposing for about a second to a hole about an inch in diameter, cut into a sheet of brown paper, forming a screen to the window at a distance of three or four feet away. Although we have had occasion to employ this method of exposure, or a similar one, of using a lamp giving a small, although intense, flame, in the producing of lantern slides on wet plates, yet do we not recommend its adoption where it can be avoided, for this reason, that, no matter what care is taken, there is always a possibility of some of the silver-nitrate solution on the wet plate reaching the negative, which would be ultimately ruined if it were allowed to remain on, its removal being attended with some trouble.

With a camera of conjugate focus, as the copying camera has sometimes been designated, not only can no harm accrue to the negative, but the relative dimensions of the negative and the transparency may be varied to any desired extent; a 12×10 negative may have all or no portion of its subject reduced to lantern-slide dimensions, or, on the contrary, a small portion of any negative may be enlarged to them.

The collodion for lantern slides must be quite free from opalescence, at any rate from such as has not its transparency entirely restored by being subsequently varnished. It should also be thinner than that which proves best for negatives, and it is desirable it should be of a red colour from the presence of free iodine, which conduces to that perfection of the high lights so necessary in a high-class slide. As this has already been described in a previous chapter, it is not necessary to go over that ground again.

One point is, however, worthy of attention, and it is one connected with the iron developer. If an old or long-standing iron developer is examined, it will be found to have become of a yellow or pale sherry colour. This arises from the peroxidation of the iron. Now, it was long since observed that a clearness of the shadows characterised the employment of a developer in this condition, and it was also recognised that the old rusty copperas of the drysalter's stores made a better developer, as regards securing freedom from fog, than the purer ferrous sulphate; further, that the latter might be kept fresh and good, yielding a colourless solution by the presence of a trace of sulphuric acid. It was subsequently found that the anti-fog properties of the persulphate arose from its exercising a solvent action upon the incipient deposit suggestive of and correctly designated as fog.

To apply this to the topic now on hand: When developing lantern slides, it will be found advantageous to employ a somewhat common copperas encrusted with peroxide in preference to a sample of pure protosulphate, for the reason hinted, viz., greater clearness in the transparent portions. It may also be well to know that this condition of peroxidation may be induced in a developing solution made of pure protosulphate by dissolving the crystals, not in cold, but in boiling water. Into the chemistry of this it is not considered necessary now to enter.

What we have called clearness in a lantern slide may be ascertained by laying it down upon a white sheet of paper and seeing whether there is any indication of degradation in those portions which should be clear glass—a bright sky, for example. The fixing may be effected by cyanide of potassium, followed by thorough washing.

It does not at all follow that a lantern slide should be condemned because the details are covered by a slight veil, because this may be removed by immersing the plate in a weak solution of cyanide, to which a few crystals of iodine have been added. A sharp eye must be kept upon it from the moment it is immersed to prevent the solvent action of this clearing solution being carried too far, because, if this is not attended to, the entire image may be found to have been dissolved out. If the foreground and middle distances are found to be correct, but the sky remains dingy, the local application of the cyanide clearer by means of a flat camel's-hair brush should be had recourse to. All this may be done in much less time than it takes to write this.

Toning the picture in most instances confers a greater amount of density than it possessed previous to this operation. A toning agent that makes the image black without conferring much density is a plain solution of bichloride of mercury. The duration of the immersion in this solution should be such that the colouration is seen on the glass or back slide when the plate is lifted up for examination. It must then be immediately and well washed, so as not to allow the action to proceed to the bleaching stage. If the resultant tone is found to be too cold, this is remedied by a subsequent immersion in a *very weak* solution of ammonium sulphide (sulphuret of ammonia); but, as this confers a slight additional intensity as well as warmth to the image, the judgment of the operator must be largely brought into play.

An agreeable, warm, purple-black is obtained by a mixed toning bath composed of chloride of gold and potassium sulphide. Exactitude in either the strength or the relative proportions of either does not appear to be of great consequence, but the predominance of the potassium salt (liver of sulphur) tends to warmth. Indeed, this substance forms a toning agent itself without any other admixture. On account of its extreme cheapness, there is a tendency to make the toning bath strong, but this must be resisted, and the strength kept so low as to require at least one minute for its influence to be noted on the back of the plate.

Chloride of platinum is exclusively employed by some manufacturers in the toning of their slides. It gives a nearly pure

black tone, which is liked by many. Like chloride of gold, the salt of platinum is commonly sold in sealed glass tubes, fifteen grains being a usual quantity thus enclosed. Being exceedingly deliquescent, it is better to measure out a definite quantity of water, say fifteen ounces, and, having inserted in the bottle containing it the unbroken tube of platinum, fracture it by crushing it against the bottom by means of a glass rod. One part of this may then be added to ten ounces of water, and this will be found to be quite strong enough for a toning bath. Being very acid, it is necessary that it should be brought to a nearly neutral state by carbonate of soda, and then reacidified.

If the transparency is a photographic enlargement of such an unpopular object as a bug, regard must be had to the colour, and for it, or things of a similar class, the toning should be effected in the following manner:—Make a cold saturated solution of bichromate of potash, dilute a portion of it with an equal bulk of water, and add thereto a few drops of hydrochloric acid. A transparency placed in this solution becomes of a delicate white colour, the metallic silver image being converted into the chloride. This, after washing, has a very weak solution of Schlippe's salt (sulphantimoniate of sodium) poured over it, by which it becomes of a scarlet-brown colour, very like that of the insect itself.

There are several other agents by which colour can be imparted to the image forming the transparency, but those mentioned embrace the best and most popular of the toning agents.

As collodion transparencies are so much more liable to be damaged than those made on gelatine, they should invariably be varnished as soon as they are finished. A crystal varnish composed of dammar dissolved in benzole forms a good protecting medium for transparencies. It is applied to the cold plate, and dries quickly and brightly.

RE-EXPOSING SPOILT PLATES.

In recent issues a couple of correspondents have given their experience in re-exposing plates that have already undergone the process of development, but, so far as can be judged from their respective accounts, neither has scored an unqualified success. That the operation is perfectly feasible, and, under the conditions quoted, quite easy when proper precautions are observed, is, however, not difficult to demonstrate. The only points that require attention are, that the film be entirely free from fog produced by the first development, that the developer be thoroughly washed out as quickly as possible, so as not to give rise to any tendency to fog from chemical action, and, as a matter of course, that the plate be carefully protected from white light.

If these conditions be observed rigidly, the film, when ready for the second exposure, differs in no way, unless, perhaps, in sensitiveness, and that to but a slight extent from its original condition—at least, theoretically; for practically, of course, a good deal depends upon the physical character of the film to commence with, and the thoroughness of the washing to which it is subjected between the two exposures. But in actual practice, to take the case of either of our correspondents, if a plate is suspected not to have been exposed, and on the application of the developer for such a time as would, under normal conditions, be sufficient to produce an image, shows no sign of any, it may be at once inferred that the suspicion is correct. Under such circumstances, if the developer be at once poured off, before any symptom of fog appears, and the plate thoroughly washed with as little exposure to even ruby light as possible, it may be at once re-exposed in the wet state, with very little fear of any but a successful result.

When, however, the plate is laid aside to dry before exposure, the conditions are, to some extent, altered; for, unless the washing be very completely performed and every trace of the developing solution removed, the prolonged action of the reducing agent upon the moist silver bromide during the period of drying will be almost certain to set up an incipient fogging action, which will interfere materially with the subsequent development. A minute or two's soaking in a weak solution of bromide of potassium, followed, of course, by copious washing, will obviate all danger from this cause if due care is observed in other directions; but the plate will be rendered a little slower in action by the treatment, especially if originally it was one of the more rapid kinds.

So far, indeed, as concerns the application of a developing solution of full strength to a plate that has not been exposed to light, there is no theoretical reason why any injurious action should be anticipated, provided, of course, the film is entirely free from any inherent tendency to fog from chemical causes. As a matter of fact, in many of the old dry-collodion processes reducing agents, such as tannin, gallic acid, and even pyro, were applied to the films or added to the emulsion as organifiers or preservatives with the most beneficial results, and certainly without any danger of causing fog, if the remaining conditions of preparation were as they should be. The only difference between collodion and gelatine films in this respect lies in the greater amount of washing necessary with the latter to remove soluble matter, and perhaps the greater sensitiveness of the latter to fogging influences.

The utility of this method of re-exposure is, however, not very obvious, since the accidental development of an unexposed plate is not an every-day occurrence, and the saving of an occasional plate is scarcely worth the trouble involved in washing; but circumstances may arise in which a large number of plates are rendered useless by accidental exposure to light or other causes, and then a method by which they may be restored to a useful condition may become well worth adoption, and fortunately the restoration under such conditions is perfectly easy, although it involves a little trouble as a matter of course. The same method may also be applied in cases where, as occasionally happens, a batch of plates proves unsatisfactory from inherent fog, that cannot be otherwise got rid of. In such cases the trouble involved, when spread over a large number of plates, becomes infinitesimal, and justifies the means.

The fog which has to be removed, whether caused by exposure to light or by some chemical influence during the process of manufacture, consists in either case of silver in a partially altered condition from the normal haloid state, and the process to be followed consists in restoring it to the state of bromide. This can be done in a variety of ways, though all bear a strong similarity.

Perhaps the simplest and best plan to adopt with a merely fogged plate is to immerse it in a weak solution of hydrobromic acid; the strength is not very material, but one part of the commercial acid of about 1·4 specific gravity in twenty parts of water will answer very well. The acid should be freshly prepared or tolerably so, and should not be diluted until required for use, and in using it, in order to secure

uniformity and efficiency of action, it is better to apply a measured quantity to each film, and to use it only once. For instance, half or three quarters of an ounce of solution will comfortably cover a quarter-plate in a suitable dish, and when its action is complete it can be thrown away, and a fresh lot taken for the next plate.

In applying it, the solution should be poured on to the dry film, and the dish kept in motion for two or three minutes, so that the effect may be uniform and complete. It is important that the film be not wetted previously, as the acid solution is then absorbed quickly and evenly throughout the entire thickness of the gelatine; whereas, if the latter is first saturated with water, it will be a considerable time before the acid can displace it, especially at the glass side of the film.

After two or three minutes' immersion in the acid (longer will do no harm), the film is just washed under a tap or water from a jug, and then placed to soak in clean water for half an hour. The volume of water should be considerable, or should be frequently changed, and the washing is complete when the water shows no sign of acid to litmus paper. A few drops of ammonia may be added to one of the changes of water, but it is perhaps preferable to rely entirely upon plain washing. After washing, the plates are pressed singly under a blotting pad, with a piece of clean, old linen free from fluff, to remove the superfluous surface water, and are then reared up in a box or cupboard, free from dust or light, to dry.

It is, of course, necessary to protect the films as much as possible from light of every kind during the whole process, and therefore the dishes should be kept carefully covered as much as possible.

If hydrobromic acid is not readily obtainable, an alternative solution may be made of bromide of potassium and bichromate of potash, ten grains of each to the ounce of water. This need not be used in small quantities like the dilute acid, but is better employed in considerable volume, when the same quantity will answer for a large number of plates. The immersion may be about the same, but should not be unnecessarily prolonged; but the washing will have to be more thoroughly performed, in order to remove the last traces of bichromate. The latter clings very tenaciously to the gelatine, and, if allowed to remain in ever so small a quantity in the dried film, is fatal to sensitiveness.

The most thoroughly effective solution for very bad cases of fog consists of a combination of hydrobromic acid with bichromate of potash. The former alone is scarcely sufficient in bad cases of chemical fog, but the combination answers perfectly. Indeed, as a matter of experiment, we have often with this solution treated an unfixed negative, upon which an image has already been developed. The hydrobromic acid reconverts the metallic image into bromide, while the bichromate destroys all previous impression produced by light.

It is well known that, under the old form of silver development, the image might be destroyed and redeveloped time after time without fresh exposure to light; but, though with alkaline development this is not the case, at least to the same extent, we believe that the destructive action of the bichromate is absolutely necessary to prevent the recurrence, to a slight degree, of the previously impressed image.

Whether the restoration of spoilt developed plates will ever be a practically remunerative process or not, we are unprepared to say, but we can answer for its being possible.

The Photographic Society of Great Britain.—At the meeting on Tuesday evening it was announced that Mr. Chapman Jones had been re-elected Hon. Secretary and Mr. E. Clifton Hon. Librarian. To fill the vacancies thus caused on the Council, Mr. J. W. Marchant and Mr. B. Gay Wilkinson were chosen.

Meteorological Exhibition.—The Council of the Meteorological Society have arranged to hold an exhibition of instruments, photography, &c., relating to the representation of measurements of clouds, next April. The Exhibition Committee invite co-operation, and, among other things, will be glad to show photographs possessing meteorological interest.

The Price of Metallic Silver.—This week metallic silver has dropped to the extraordinarily low price of 2*s.* 3½*d.* an ounce. When, some months ago, a quotation of half-a-crown an ounce was reached, so phenomenally low a figure was, incorrectly as now appears, confidently hoped to have "touched bottom." Though this fluctuating price is not likely to permit dry-plate makers to reduce their prices, it may certainly have a tendency to induce them to make heavier films, which is the evident tendency of the most recent deliveries, a condition which makes for excellence in every way.

Sun Spots.—The daily papers have published many letters lately, calling attention to a very large spot now visible with the naked eye. For those who would wish to keep a record of these phenomena, it is a simple matter to take an instantaneous photograph, with a lens well stopped down to reduce the light, and to enlarge the resulting negative eight or ten times. A fifteen-inch focus lens would give an image about one-eighth of an inch diameter; a sun picture, an inch across, would be quite large enough to be interesting. Where very exact definition was not looked for, a pinhole in a piece of tinfoil would be as efficient as a lens, and a large diameter view could be obtained at one operation.

Chlorine or Ozone in Oxygen Gas.—We have on a former occasion drawn attention to the statement that ozone is the foreign gas accompanying oxygen in chlorate-of-potash-produced gas; to this foreign gas, no doubt, the well-known "rotting" of gas bags is due. We now have to draw attention to a paper read at a recent meeting of the Chemical Society, in which the writer, Mr. Herbert McLeod, F.R.S., shows how he examined the question, tested the gases carefully, and found no ozone. His tests all pointed to the presence of chlorine. In the subsequent discussion Professor Dunstan remarked that the odour of the gas resembled chlorine, and that, if it was present, still another explanation was offered as to the constitution of the offending gas.

Modifying Platinum Prints by After-treatment.—Before the members of the Photographic Society of Great Britain on February 27, Mr. A. W. Dollond described and demonstrated an interesting, useful, and simple method of improving the tones of weakly printed platinum proofs. The method consists of first soaking the print in plain water, next flooding its surface with glycerine, and then applying an acidified solution of gold chloride. This intensifies the platinum deposit, converting it into a rich blue black. Treatment with a metol-carbonate developer completes the operation, by reducing any free gold chloride that may remain on the print. Several comparative examples of toned and untoned platinum prints were shown and produced, and the improvement by the gold toning method was most marked. Mr. Dollond's paper was of considerable interest.

The Photographers' Benevolent Association.—We publish in another column the annual report and balance-sheet of the Photographers' Benevolent Association. It will be observed that the amount distributed is largely in excess of donations and subscriptions received during the past year. The knowledge that so much increased good has been done among necessitous photographers is embittered by the circumstance that now, as heretofore, only a microscopical proportion of the income proceeds from those for whose benefit the Association primarily exists. What a scandalous reproach it is upon a large and rapidly growing profession that so few of them seem to have, even in a mild degree, the most elementary notions of thrift or self-help such as the Photographers' Benevolent Association desires to inculcate!

The Effect of Irregular Light Action on the Brain.—While we have no desire to pose as alarmists to dark-room workers, there is much food for reflection in the current number of *Brain* in an article in which Mr. H. Work Dodd gives the result of his investigations of the result of errors of refraction in the eye upon the brain. It is needless here to do more than give the results indicated by Mr. Dodd as following this irregular condition. Given certain conditions of instability of the nervous system, he concludes that (1) errors of refraction may excite epilepsy; (2) the correction of the error of refraction will, in combination with other treatment, in many cases cure or relieve the epileptic condition; (3) in some cases, when the error (by optical means, we presume) has been corrected, this epilepsy will continue, generally in a modified form, in consequence of other irritation, even though the refraction error may have been the exciting cause in the first instance. Now, it is a perfectly legitimate conclusion to draw, that such irregular light action as prevails in the dark room—that is to say, the exclusion of all, or most, of the more refrangible rays of the spectrum—might not improbably under similar nerve conditions be a cause of serious mental disturbance to those subjected to the influence of this modified light.

New Theory of White Light Sensation.—The well-known theory of white light being constituted, not of seven primary colours, but of three only, as originally proposed by Young, and afterwards powerfully demonstrated by Helmholtz, offers several difficulties, which have been either explained away or been accepted as needing a further hypothesis. A new hypothesis by Christine L. Franklin is expounded in the last two numbers of the periodical, *Mind*. We append a brief exposition of it as given in the pages of *Nature* last week:—

"The new theory of light sensation devised by Christine L. Franklin, and intended to avoid the difficulties involved in the acceptance of the two chief theories in the field at present, known as Helmholtz's and Hering's theory respectively, is expounded in the last two numbers of *Mind*. While the Young-Helmholtz theory supposes that the judgment picks out of a mixture of colours all the even red-green-blue sensations, and deceives itself into thinking them to be a new sensation called white, the new theory assums an independent retinal process as ground for the latter sensation, therein agreeing with Hering's theory. But, while Hering supposes that some parts of the spectrum produce construction, and others destruction, of the tissue of the retina, Miss Franklin considers that the sensations of the black-grey-white series must be regarded as the fundamental ones, and attributed to the dissociation of certain molecules, which she provisionally calls the grey molecules. The atoms thus dissociated have different periods of vibration, and in the more highly developed visual organs—those capable of colour sensations—these colour atoms differ in behaviour according to the wave-length of the light beating upon them. Thus, some atoms would only be torn off by red light, and would give rise to the sensation of red. The prevalence of such colour molecules would coincide with the predominance of the structures known as cones in the fovea of the retina, while the 'rods' are endowed chiefly with grey molecules. This is simply translating into the language of the theory the well-known fact that the colour sense is chiefly confined to the centre of vision, as anybody may prove by looking at a coloured object through the corner of the eye. This distribution, says Miss Franklin, offers a perfect analogy with that of the organs of hearing. In the ear we have a very simple apparatus for hearing noise only, and also a highly differentiated structure for the discrimination of notes of various pitches."

PRACTICAL REMARKS ON THE WORKING OF GELATINO-CHLORIDE PRINTING PAPER.

II.

In a previous notice I referred to the employment of glass in preference to all other mediums as the best surface to use for squeegeeing the prints upon.

Somewhat recently a roller squeegee has been placed upon the market, and it is marvellous how many workers rush to get one for the purpose of squeegeeing prints on to ferrotype plates or slabs of vulcanite. I am aware the idea is that the roller pattern does not so readily roughen the back of the print, but in no sense does such a tool equal the good old sheet rubber squeegee, properly used.

A squeegee need not be set in a wooden handle, although such is a luxury, for the best workers more frequently use a common piece of sheet rubber, having true edges. A frequent error met with in the article sold by dealers is the size of such. Four inches in length is quite broad enough for all kinds of ordinary work, still the size most commonly sold is eight inches. Such can, with advantage, be cut in half with a good saw, for better and truer work will be done with a small squeegee than a broad one, and, where a large number of small prints have to be laid on one sheet of glass, the small size permits of closer work being done than a large one, for with such the prepared surface of the glass which is to receive other prints is in no way touched or interfered with when squeegeeing the first or second print down. I have often smiled when seeing the pressure and labour displayed in laying a modest quarter-plate print on to a ferrotype plate by means of one of the new-fangled roller squeegees.

Squeegeeing, properly understood, is the simplest thing imaginable, and, instead of requiring any great amount of labour, is, on the contrary, best done with the least possible amount of such; in fact, it is merely a quick but light passage of the edges of the rubber across the back of the prints. One sweep is all that is necessary, and the quicker and lighter the touch the better, and, when properly done, there will be no roughening of the surface of the paper. Some workers employ an intermediate sheet of thin rubber cloth, and squeegee over such; but, in every-day practice, where large quantities of prints are being dealt with, the work is got through quite as well and much more expeditiously without such.

It is at this stage that the employment of glass will show its advantage, for, by examining the surface of the prints through the glass, any defects can be at once detected, when the print can be easily removed, rewetted, and again laid down on a different glass.

One fruitful source of defects is the touching of the surface of the printing papers or prints with hot fingers or hands. In hot weather this ought to be most carefully guarded against. Should a print, on being for a second time laid down, show the same defects on its surface, it is clear proof that the face of the printing paper or print has been contaminated with hot fingers or some other deleterious matter.

After the prints are squeegeed down, a clean sponge or cloth is passed across the backs, this will remove all superfluous water; the glasses are then laid aside for a short time preparatory to backing.

The backing supports vary according to the size of the print. For large pictures, one sheet cardboard (which can be bought in large lengths) is the best to employ, while for small sizes, such as quarter-plate, any good stout, but smooth, note-paper may be used, and will be found as good as anything.

The prints are laid down without being trimmed, and the backing papers are cut to sizes just a trifle smaller. Having a good supply ready at hand, they are soaked for a few minutes in clean water, and then removed and placed between thick folds of dry towelling, and, when in much the same condition as the moisture of the prints, they are well coated with good stiff paste, and laid neatly over the back of the prints; the squeegee is again passed lightly over the backing papers, and the glasses are set aside in a warm place to dry, strong heat or rapid drying being avoided. Care must be taken that the prints are not withdrawn from the glasses until thoroughly dry; if so, the prints will buckle up, and cause some bother when the mounting has to be done. Twelve hours in a moderately warm temperature of, say, about sixty-five degrees, is not too short a time when thick backing is employed to thoroughly desiccate the prints.

All going well, when the removal stage is reached, they will, with the greatest of ease and pleasure, lift from the surface of the glass, without any trouble or pulling being necessary; they will leave the glasses with a crackling noise, and show a very highly glazed surface.

The prints are then carefully cut to sizes of cards or boards, and the final stage, viz., that of mounting them, is reached.

There is, after all, only one really reliable mountant to employ, and that is "guid Scotch glue." Of course, everybody knows how to melt glue, but for our purpose it must not be used too thick—in fact, the thinner the better, and it must be kept hot during the time the pictures are being mounted.

Obtain a suitable size camel's-hair brush with a long handle, which will enable the fingers to be kept clean whilst mounting. Take up a print with the left hand, and, without any undue haste, go carefully and neatly round the edges of the back of the print, with the brush well charged with the *thin hot glue*. If the brush is of suitable size and well charged with glue, it will not need a second application to the glue-pot, but will contain sufficient to go round the entire print without any stoppage. The print is then laid neatly down on its card, and a very slight pressure over its surface with clean blotting-paper will cause it to adhere more firmly than any other mountant will do. Glue properly used is a very clean article to work with, and it is wonderful how rapidly a batch of prints can be mounted with its aid. The chief point to observe is to keep it thin and hot. After constant use, of course, it will thicken, but a little hot water added will soon thin it again. Keeping the glue thin prevents lumpy mounting and the oozing of the glue outside the edges of the print.

T. N. Armstrong.

CONTINENTAL NOTES AND NEWS.

A Book and Paper Exhibition.—At the Palais de l'Industrie, Paris, from July to December next, there will be held an International Exhibition devoted to books and papers in their innumerable methods of production and uses. It will be divided into fourteen groups and thirty-seven classes. Group 5 has three classes in which photographic apparatus, processes, prints, &c., will be illustrated in connexion with the main subject. The office of the Exhibition is at 28, rue Caumartin, Paris.

Action of Cold on Sensitive Plates.—A writer in a contemporary, after pointing out the slowing action which a fall in temperature exercises over developing solutions, remarks that cold lowers the sensitiveness of an emulsion, so that instantaneous work is more difficult of accomplishment in winter than in summer. The theory that a sensitive film is itself reduced in sensitiveness by cold is, we think, open to objection.

The "Continuing Action of Light" on Exposed Plates.—M. Goderns says that the question whether the action of light on a sensitive plate is of a persistent nature after exposure has hitherto not been definitively settled, but he is convinced, after careful experiment, that the action entirely ceases with the exposure. He cut a plate in two, and gave both halves identical exposures in a sensitometer; one half was developed immediately, the other a week later. In both the same scale of tints was obtained.

Thiosinamine.—Thiosinamine may be prepared in the following manner:—Mix one volume of oil of mustard with four volumes of liquor ammoniæ, ·880, and allow to stand for from eight to ten days. At the end of that time crystals of thiosinamine will be deposited, which are first well washed, and then dissolved in warm water and finally recrystallised.

Sensitised Post Cards.—Post cards, sensitised with a silver compound, are now articles of commerce in France. They are printed out under a negative in the usual way, and then toned and fixed. A package of ten, with three masks, retails for a franc and a half.

Gelatine as a Sensitiser.—In the *Rundschau*, Professor Victor Schumann has confirmed the influence of gelatine as a sensitiser in an emulsion. He states that the thickness of the gelatine film has a direct relation to the sensitiveness of the plate, a diminution of the gelatine in an emulsion being always accompanied by a decrease of sensitiveness.

Cyanotype for Post Cards.—Instead of a silver process, the following is employed in Germany for sensitising and printing on post cards:—1. Ammonium ferric oxalate, 1 gramme; ammonium ferric citrate, 1 gramme; water, 15 grammes. 2. Potassium ferridcyanide, 1 gramme; water, 10 grammes. No. 1 is the sensitising solution. The dried card is exposed under a negative, and the faint image developed in No. 2 solution. For over-exposed results add to the wash water a few drops of ammonia; weak images can be intensified in a feeble solution of hydrochloric acid.

Plates or Films.—A German contemporary recently invited its readers to indicate which they preferred, plates or films, and a number of replies was received, the general tendency being to laud films for their lightness. Most of the voters appeared to prefer plates for indoor use, on account of the greater certainty of results obtainable with them. Roller films by some were held to be difficult and delicate in manipulation, and it was thought that the sensitiveness of films generally often left something to be desired.

The Lippmann Colour Process.—At the Académie des Sciences recently, M. Lippmann discussed the nature of the structure of the sensitive film impressed by interference waves. He remarked that the phenomenon was much more complicated under the action of white light in contradistinction to a homogeneous light, and also that white was the most difficult to reproduce on account of its being the synthesis of all the other colours. If, however, white could be reproduced, it followed that all the other colours would be rendered in their true values.

REVIEW OF THE THEORY AND USE OF URANIUM COMPOUNDS IN PHOTOGRAPHY.*

III.—Uranium Printing Processes.

The history of uranium printing carries us back to the year 1804, when Gehlen discovered that an alcoholic solution of uranium chloride, after a short exposure to sunlight, first became turbid, and then deposited a green precipitate, the solution gradually losing its colour as the deposit of uranium increased.† This change, in the present state of our knowledge, would be represented by the equation

$$2\,UO_2Cl_2 = UCl_4 + UO_2 + O_2$$

the oxygen being used up in the oxidation of alcohol, with formation of acetic acid.

No practical results, however, seem to have immediately followed this discovery; but, early in 1857, Burnett laid before the Photographic Society of Scotland‡ the results of his experiments with uranium compounds. He coated paper with various uranium salts, such as the nitrate, citrate, or tartrate, and, after drying of the dark, exposed it beneath a negative in sunlight. A faint image of uranous salt was impressed, which was developed in either of the three following ways:—

1. By floating on a strong solution of potassium ferricyanide. This substance gives a chocolate-brown deposit on those portions of the image which consist of uranous salt. The unaltered uranic salt and the excess of ferricyanide are now washed out with water, leaving a brown picture of uranous ferricyanide, and not of metallic uranium, as has often been asserted. It may be mentioned here that later workers carried this result still further. Thus the brown pictures were changed to green in a bath of cobalt nitrate, fixing afterwards with—

Ferrous sulphate	4 parts,
Sulphuric acid	4 „
Water	100 „

while black tones were obtained in a bath of ferric chloride, acidified

* Concluded from page 102.

† *Neues Allgemeines Journ. der Chemie*, iii. p. 566.

‡ *Photographic Notes*, 1857, p. 97.

with hydrochloric acid. A modification of this process has been more recently given by Boivin.* He sensitises gelatinised paper with—

Uranium nitrate	20 grammes,
Tartaric acid	3 „
Water	100 c.c.,

and develops with a four per cent. solution of potassium ferrocyanide, clearing by washing and weak nitric acid. The blood-red tone is now changed to dark blue with ferric chloride, and brown or blue-black with a mixture of ferric chloride and gold chloride.

2. By floating on a ten per cent. solution of silver nitrate. In this case the silver nitrate is reduced by the uranous salt, and a grey image of metallic silver is produced. One advantage of this process is the very small amount of silver which is necessary. The silver image may afterwards be toned with gold or platinum. M. Houdoy† afterwards obtained sepia tones by immersing this silver print in a bath of ferrous sulphate, acetic acid, and water.

3. By floating on a one-tenth per cent. solution of chloride of gold. The action is the same as in the second method, the image being a purple or black deposit of metallic gold. By this method Burnett obtained a curious result in using uranium aconitate. The image had in this case a metallic (gilt) appearance. Bollman recommended treating the exposed paper with weak alcohol or ether before applying the gold solution.

A fifteen to twenty per cent. solution of uranium salt is sufficient to reproduce these experiments. Burnett experimented on a large number of uranium compounds, and obtained many variations of tone and sensitiveness; but the tartrate, citrate, acetate, and malate proved the most sensitive compounds.

In the following year, 1858, Niépce de St. Victor repeated and extended these results,‡ and tried to secure an English patent. It was gradually becoming recognised that the sensitiveness of uranium compounds was maintained in the presence of various other organic substances, such as gelatine, collodion, and albumen. Paper and even glass coated with these substances and sensitised with uranium salts gave successful results, while positive transparencies of extreme delicacy were obtained by adding uranium nitrate to uniodised collodion, and coating glass plates or paper with the sensitive film. A further range of tones was produced by using mercuric chloride as a developer, and also by sensitising with a mixture of equal parts of uranium nitrate and silver nitrate to avoid the necessity of development. In this latter case the silver salt combines with the organic matter of the paper, and its subsequent elimination by a hyposulphite bath becomes necessary. The names of La Blanchère, Draper, and Hagen are associated closely with these progressive discoveries.

Perhaps next in chronological order Poitevin's process should be mentioned.§ He sensitised paper with a mixture of ferric chloride and uranium nitrate. The reduced uranium salt, after exposure, altered the ferric to ferrous chloride, so that on the application of tannin or gallic acid only the unexposed parts were blackened. This was, therefore, a direct positive process.

We now come to a process which created for some time a considerable amount of interest in the photographic world, and which probably would not have died so completely out of use if it had not been stifled by protective patents.

In 1863 J. Wothly, a photographer of Aachen, invented the process known as Wothlytype. Paper coated with arrowroot, starch, or albumen, was sensitised with collodion, to which uranium nitrate (three parts) and silver nitrate (one-eighth part) dissolved in alcohol (eight parts) had been added, the collodion being three times the volume of the alcohol. After exposure and washing in weak acetic or hydrochloric acid, the print was toned with gold chloride. Instead of collodion, alcohol could be used for matt surfaces, and the silver nitrate could be replaced by gold, platinum, or palladium chloride. A little castor oil and Canada balsam were added to the collodion to make it flexible. A certain amount of moisture is necessary to produce vigorous copies, and very dry paper should be breathed upon or steamed after exposure. The chemistry of this process differs in no way from what has already been described. The salts of gold and silver being reduced by uranous compounds to the metallic state, exposure to light gives a positive picture in finely divided gold or silver. It is stated that most beautiful and delicate pictures were obtained by this means; but the process never became popular. There was much discussion about the permanence of the prints produced by this process, but there is nothing to show any inferiority in this respect to other processes.

Uranium printing has not been entirely neglected in recent years. The following process was given in 1887 in the *St. Louis Photographer*:—Soak paper for two minutes in a solution containing—

Uranium nitrate	23 grammes.
Copper nitrate	6½ „
Water	95 „

Expose for ten or fifteen minutes until a feeble image is seen, then develop in—

Potassium ferricyancide	15 grammes.
Water	600 „

A red-brown image, with bronze reflection, is obtained, and may be fixed by washing well in water. For black velvety tones use a solution of platinic chloride instead of the ferricyanide.

Quite recently some work has been done in uranium printing by M. Ommeganck in Belgium;* but, although not quite extinct, the process has been dormant since the decline of the Wothlytype process nearly thirty years ago.

It is possible that in the excitement of the rapid strides made in recent years in dry-plate photography, the attention of investigators has been diverted into other channels, for it can scarcely be said that uranium printing has had that share of attention to which its somewhat brilliant though brief career has entitled it. Full of promise, and not wanting in enthusiastic admirers, it died mysteriously, even before its methods were properly understood.

IV.—Uranium Salts in Negative Processes.

Uranium nitrate was strongly advocated by Wortley, in 1872, as an addition to the nitrate of silver bath in the wet process, and also in collodion emulsions. It has also been advocated in gelatine emulsions. It is probable that the acidity of the uranium salts acted beneficially in securing freedom from fog, but photographic opinion seemed to be strongly against any other utility. It is not thought that any useful purpose would be served in reproducing here the long controversy which was excited twenty years ago upon the supposed increase of sensitiveness caused by uranium salts.

V.—Uranium Salts as Intensifiers.

Selle's uranium intensifier, first used in 1865 for the wet-collodion process,† consists of a mixture of ten parts of uranium nitrate, ten parts of potassium ferricyanide, and 500 parts of water. The reactions are as follows:—On the addition of potassium ferricyanide to uranium nitrate, there is a double decomposition, with formation of soluble uranic ferricyanide:—

$$3UO_2(NO_3)_2 + K_6(FeCy_6)_2 = (UO_2)_3(FeCy_6)_2 + 6KNO_3.$$

The contact of uranic ferricyanide with the metallic silver of the negative causes a deposit of a red-brown uranic ferricyanide upon the image, silver ferricyanide being formed at the same time, thus:—

$$2Ag_2 + 2(UO_2)_3(FeCy_6)_2 = 3(UO_2)_2FeCy_6 + Ag_4FeCy_6.$$

The intensity of the image is, therefore, increased by the greater opacity of the red-brown deposit.

Dr. Eder has shown that a gelatine film is hardened by the action of a ferricyanide, and the penetrating power of the intensifying solution is thus diminished. To obviate this, the addition of a small quantity of acetic acid is recommended. It is very important that no hyposulphite remains in the film, since this causes a reduction of the uranic salt, with a deposit of a slight chocolate veil over the shadows. The intensification is permanent, and very effectual if no hyposulphite is present.

VI.—Uranium Toning.

The desire for warm tones in bromide prints has led lately to increased attention being given to the reactions just described. The chemical action in uranium toning is precisely the same as in uranium intensification. The toning process is, in fact, an intensifying process, consisting in the substitution of the ferrocyanides of uranium and silver, in place of the metallic silver forming the image of the so-called bromide print. But there is this essential difference: in intensifying a negative, the final effect is observed by transmitted light, while, in toning a print, the effect by reflected light comes into play.

As early as 1862 a uranium toning bath was advocated for albumen

* *Moniteur de Phot.*, 1879, p. 164.
† *Photographic News*, 1858, p. 88.
‡ *Comptes Rendus*, xlvi. p. 448; xlvii. p. 866.
§ *Bull. Soc. Fran. de Phot.*, 1859, p. 157.

* *Bull. Assoc. Belge.*, ix. p. 680.
† *Phot. Archiv.*, 1865, pp. 326, 393.

prints, and extensively used in America. The toning bath consisted of—

1.

Uranium nitrate	15 grs.
Water	2 ounces

(neutralised with bicarbonate of soda).

2.

Gold chloride	15 grs.
Water	2 ounces

(likewise neutralised).

3.

Sodium acetate	100 grs.
Water	32 ounces.

The chloride of uranium was preferred in some cases, and it was claimed that the uranium toning bath gave softer prints, of a better colour, and more stable in the subsequent fixing operations. This process has also been quite recently advocated.*

Platinum prints were toned by Paine† in a bath consisting of—

Uranium nitrate	1 gramme.
Acetic acid	6 c.c.
Water	240 „

Added to—

Potassium ferricyanide	1 gramme.
Acetic acid	6 c.c.
Water	240 „

All iron salts must be carefully eliminated in a bath of strong hydrochloric acid before toning, to avoid blue stains. He procured by this means a variety of tones, from a fine brown to a Bartolozzi red.

In toning bromide prints, Elder‡ advocates a preliminary washing in a two per cent. solution of sulphuric acid, clearing the whites after toning in an alum bath acidified with sulphuric acid. A fresh immersion in the hyposulphite bath also clears the whites, and reddens the tone to a burnt sienna. The following bath—

Uranium nitrate	2 grains
Potassium carbonate	10 „
Water	2 ounces

has been used for giving black tones to matt-surface prints.

In most of the uranium toning processes the resulting image consists, as has already been pointed out, of the mixed ferrocyanides of uranium and silver. Weir Brown§ has proposed to remove the silver salt, after toning and washing, by means of Farmer's reducer, leaving the image in uranium ferrocyanide only. By this means he procured agreeable Bartolozzi reds. Professor Namias has suggested the removal of the silver ferrocyanide by the addition of ammonium sulphocyanide to the toning bath. It is advisable, if the silver salt is removed, to obtain as thick a deposit as possible in development, to avoid too great a diminution in the strength of the image.

There seems to be room for still further investigation in the various tones which may be obtained by modifying the strength and composition of the ordinary uranium toning bath.

VII.—Uranium Compounds in Photometry.

Niépce de St. Victor, in 1859, used a mixture of uranic nitrate and oxalic acid for photometric purposes. The action of light reduced the uranic nitrate to uranous nitrate, liberating oxygen in the manner already described. The liberated oxygen at the same time decomposed the oxalic acid into water and carbon dioxide. Thus the measurement of the quantity of carbon dioxide produced afforded an index to the amount of decomposition effected by light in the uranic salt. Monckhoven used a similar method in 1879. It is not necessary to give the detailed description of these photometers,‖ which are chiefly of interest here as illustrating the advantage which has been taken of the photo-reduction of uranic salts, in the presence of organic matter, in this branch of photographic research.

VIII.—Conclusion.

We have now passed in review the chief results which have so far been obtained from the use of uranium salts in photography. In so short an article many details have of necessity been omitted, but it is hoped that enough has been described of obsolete processes to suggest possible improvements for future use. The field is an extensive one, and there still remains a great deal for the photographic experimentalist to work upon. For the chemist there is still left the somewhat doubtful question of the constitution of uranium compounds, and the precise nature of the changes involved in the photo-reduction of uranyl salts. To the photographer there is the question of reviving and improving upon the excellent discoveries of earlier workers. Uranium printing possesses without doubt the germs of many possible variations. Amateur photographers especially would hail with delight any method of producing prints of an agreeable tone with the ease and simplicity of the ferroprussiate process. A growing desire for warm sepia tones has already led to promising results in uranium toning, but there is still much to be discovered. The fact that so much has already been done, in spite of the feverish haste which has marked the evolution of modern photography, should serve only to encourage further research in the light of more extended knowledge, more scientific methods of inquiry, and the calmer contemplation which can now be given to the results of investigation.

J. Vincent Elsden.

* *Bull. Assoc. Belge*, ix. pp. 200, 817.
† The British Journal of Photography, 1892, No. 1693.
‡ The British Journal of Photography, 1888, p. 775.
§ *Id.*, 1893, p. 709.
‖ See Eder, *Ausführliches Handbuch*, second edition, p. 370.

LORD RAYLEIGH ON COLOUR.

Lord Rayleigh's third lecture on the optical discoveries of Newton covered some interesting ground in regard to the colours of objects, real and apparent. One of Newton's most important conclusions was that, when white light is split up into its primary component colours by refraction, there is a definite relation between the amount of refraction and the colour of the ray. Nevertheless, Sir David Brewster, who was an extremely accurate observer, disputed this principle, but the experiments upon which he based his dissent from Newton now only serve to show how necessary it is to be on guard against illusions, wherever the fallible human eye is concerned. Under certain limitations, the eye is a good judge of colour; but, if those limitations are trespassed upon, some remarkable mistakes arise. Some examples experimentally illustrated by Lord Rayleigh with the aid of an electric beam and lantern will explain this. Most people think they can distinguish grey and white as different colours; but, according to Newton's view, there is no real difference between a "grey" and a white object beyond the fact that a grey object is "darker" than a pure white one. If a sufficiently strong light is only thrown on the grey, it will look white enough. The attention of the audience was directed to an almost pure white spot on the screen where the lantern beam was condensed. When the lantern beam was cut off and the daylight admitted, the audience found the white patch was a piece of very dark brown paper. Again, the phenomena of "contrast" are very perplexing. To judge of a colour with safety it must be isolated, or surrounded entirely by grey or neutral tints, and only pure white light should fall upon it. Brewster imagined that, if he took the coloured rays of the spectrum and examined them through coloured glass, he could change their colour, and his experiments in proof of this occasioned no little controversy amongst the scientists of his day; but, afterwards, his proofs were critically examined by Airey and Helmholtz, who were able to point out wherein illusions of one sort or another had led him astray. In the first place, it is difficult to get a really pure spectrum, by reason of the imperfection of the lenses; some colours are thus overlaid by stray rays of adjoining colours. Supposing the blue ray were being examined, and it had some white light mixed up in it, when examined with, say, a red glass, the blue would, of course, be filtered out, but the white rays would, nevertheless, yield up their red and orange rays, and thus deceive the observer into the belief that he had changed pure blue rays into red by passing them through a "red" glass. Helmholtz was not content with the coloured rays he got through one prism, but he took each ray separately and passed it through a narrow slit to eliminate as far as possible any stray neighbouring rays, and finally led it through a second prism to make sure that all the other rays were well dispersed, and that he had a pure coloured light. Then, of course, he found that no so-called "coloured" glass was competent to change the aspect of the ray, but that its colour remained constant whatever medium he examined it through. It was, however, very natural that Brewster should have gone wrong, because he disbelieved the wave theory of light, whereas an "undulationist" could never have accepted even the evidence of his own eyes, so contrary would have been the result to a theory so abundantly proved in other ways.

Lord Rayleigh indulged his audience to some pretty and interesting experiments as to the effect of interposing coloured mediums in front of the coloured rays of the spectrum. He showed that, though the rays from blue and yellow pigments in solution combine to produce green, this by no means proves that pure blue and yellow light have the same effect, the effect being quite the contrary. In dealing with the colours of opaque solid objects, such as cloth, paper, and so forth, Lord Rayleigh said it was usual to say that such colours were due to the light reflected from the surface. This, he pointed out, is only true in one sense. Light is reflected from such bodies, it is true, but if it were only reflected there would be no colour. It is owing to the light sinking through the colouring matter, and thus getting split up, or becoming "coloured" by selective

sorption, that we get coloured rays ultimately reflected back to the e. A coloured liquid lying in a black glass dish on the floor of the eatre was pointed out. It looked absolutely black, because such light passed through it was not reflected back again. Immediately, how-er, a white tile was placed in the dish, the colour became apparent, the le sufficing to reflect back the coloured rays which were suffered to pass rough the fluid. This is practically analogous to what goes on in the se of coloured paper or wool. While water and glass reflect back little ght falling on them, snow and pounded glass return a large portion, the rmer nearly the whole. The irregular crystals disperse the light in all irections. If, however, the irregularities or interstices are filled up with me fluid medium having the same refractive index, matters are then rought to something like a condition of transparency. Thus, a wet atch on a towel looks darker than the rest, and a wet patch on a round-glass lamp shade lets through more light at that point. It is lmost impossible to get a fluid to fill the interstices of pounded glass, hich has the same refractive index for white light as glass. But you ay get one which is equal to it in respect to one or other particular omponent ray.

Then Lord Rayleigh took a vessel full of pounded glass, mixed with isulphide of carbon and benzole. When the lantern beam was sent hrough the contents, only the green rays issued, the rest being still ispersed by the irregular refractive surfaces of the glass particles. How-ver, when the mixture was warmed up, the refractive index was so ltered that yellow rays now came through alone. Colour, then, is learly due to selective absorption, but it would be a mistake to suppose hat it is invariably so, said Lord Rayleigh. For instance, the colours of he spectrum itself are due to analysis or separation, and not to absorp-ion; again, the iridescent tints on a soap bubble are due to quite nother order of phenomena, namely, the interference of one wave of light with another, which occurs in the case of extremely thin films; but this topic, involving "Newton's rings," Lord Rayleigh has yet to deal with. An experiment with a solution of aniline dye was introduced to show that the light reflected from the surface might be one colour, and that transmitted through the body another.

THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY.

The Eastman Photographic Materials Company (Limited) held their annual meeting at Winchester House on February 26.

The new Chairman, Mr. Andrew Pringle, explained the published balance-sheet and trading account, showing a gross profit of 31,245*l.* 19*s.* 4*d.* After deducting the trading expenses and accounts written off, and suspense accounts written off that were brought forward from 1892, a net profit was left of 4139*l.* 5*s.* 6*d.*, and a dividend was passed of five per cent. upon the preference shares, and the balance cash, 1639*l.* 5*s.* 6*d.*, carried forward to next account.

The Chairman stated that, were it not for writing off the large sum of 6 127*l.*, and increasing the reserve for book debts, and writing off so much for depreciation on buildings and machinery, there would have have been a net profit of 7648*l.*, which would enable the Company to have paid ten per cent. on the preference and a good dividend on the ordinary shares.

The shareholders were congratulated on the fact that, in spite of the exceptional and universal trade depression of 1893, the gross sales were larger in 1893 than in 1892, and the percentage of gross profit had increased one per cent., while at the factory the percentage of decrease of cost of manufacture had been eight per cent.

We do not pretend to be as well able to criticise as chartered accountants are, but it only needs ordinary common sense to perceive that an increase of sales, with an increase of gross profit, and a large decrease in the cost of manufacture, must be very satisfactory to shareholders. It seems to us that it takes a great deal of courage to write off a sum of 6127*l.* for the purpose of making a healthy balance-sheet, but it is a good business move and a wise one, and leaves the Company in a healthy condition to pay larger dividends in the future.

Referring to the question of the keeping of films, the Chairman stated that he had just returned from a long visit to the West Indies, and that he took with him both the Company's transparent film, and glass plates made by the best manufacturers, and he found that the film he had exposed kept perfectly, and also, after his return to London, that some of the unexposed film had kept perfectly, while some of the unused plates had decreased in sensitiveness.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The following is the report of the Committee for the year 1893:—

The disbursements during the past year have been very considerably heavier than in any previous year in the history of the Association. This has been partly due to the publicity given to the work of the Association by the publication of outline reports of the meetings, but more largely due to the exceptional amount of destitution amongst photographers.

In spite of earnest efforts made by the Committee and by many of the friends of the Association, the income has not increased in proportion to the out-go. This has caused some of the members to urge that the grants should be kept within, or very near, the amount of the receipts for the year. A special meeting of the Committee was called to consider the financial position, and decided that, so long as the cases of distress were thoroughly investigated and found genuine, relief could not be refused so long as there was any balance in hand.

In three cases loans of 15*l.* or upwards have been granted. In each case they were to men of well-known character, temporarily reduced by great pressure of circumstances. In each case the loan prevented the breaking up of a home, and kept together a family. And there is prospect of the applicants being eventually able to repay the amounts. The remaining sum of 88*l.* 17*s.* 4*d.* represents grants and loans to twenty-six applicants, and was given in ninety-four separate sums. Where possible, the Association has supplied apparatus, &c., instead of money, saving expense by buying at wholesale rates.

A number of articles of clothing and pieces of apparatus have been received from friends of the Association and given to those in need. We solicit other contributions of this kind.

To the whole of the photographic press we are indebted for support and publicity.

It will be noticed that the item for printing and stationery is unusually large. It has been a habit with the Association, for many years, to pay each year's printing account early in the following year. We feel it advisable to keep each year's expenditure strictly in its own balance-sheet. Therefore, in order to bring the accounts straight to date, the printing and stationery bills for 1892 and 1893 are both included.

We have to specially thank The Photographic Society of Great Britain for their annual Exhibition benefit night (as we have not yet received the returns from several of the ticket-sellers, the sum acknowledged is smaller than it should be). Messrs. R. W. Thomas & Co., Ltd., are thanked for the substantial advertisment and benefit given by their "Sandell" Exhibition, The Photographic Convention of the United Kingdom, The Amateur Photographic Society of Madras, The Hastings and St. Leonards Photographic Society, and several other Societies which have had special collections or given money from their funds, are also thanked.

For the Committee,

Alexander Mackie, *Chairman.*
H. Snowden Ward, *Hon. Secretary.*

Balance-sheet for the Year ending December 31, 1893.

Receipts.	£	*s.*	*d.*	£	*s.*	*d.*
Bank Balance from 1892	206	14	9			
Balance in Post Office Savings Bank, 1892	10	7	11			
Pension Fund 2¾ per cent. Consols	250	0	0			
Interest on Investments	11	16	0			
				478	18	8
Mr. George Mason	5	5	0			
Messrs. Marion & Co.	3	3	0			
Mr. Charles Job	2	19	10			
Messrs. the Autotype Company	2	2	0			
Mr. Francis Bedford	2	2	0			
The British Journal of Photography	2	2	0			
Messrs. Henry Dixon & Son	2	2	0			
,, the Eastman Company	2	2	0			
Mr. George Mansfield	2	2	0			
Messrs. Ross & Co.	2	2	0			
The *Photographic News*	2	2	0			
Messrs. the Brighton Photographic Company	1	16	6			
,, The Albion Albumenising Company	1	1	0			
Mrs. William Bedford	1	1	0			
Mr. M. Brooks	1	1	0			
,, L. C. Brooks	1	1	0			
Messrs. the Birmingham Photographic Company	1	1	0			
Mr. F. W. Hindley (Fallowfield)	1	1	0			
,, W. Hazell	1	1	0			
Messrs. Mawson & Swan	1	1	0			
" Newman & Guardia	1	1	0			
" George Nelson Dale & Co.	1	1	0			
Mr. John Spiller	1	1	0			
,, John Stuart	1	1	0			
,, F. C. Wratten	1	1	0			
Messrs. W. Watson & Sons	1	1	0			
Captain Abney, C.B., R.E., F.R.S.	1	0	0			
Mr. C. H. Evans	1	0	0			
,, Thomas Fall	1	0	0			
Miss E. M. Hardy	1	0	0			
				48	14	4
Donations and Subscriptions under 1*l.*				22	0	0
Repayment of Loans				1	7	6
Sandell Exhibition (Messrs. R. W. Thomas & Co.)				9	14	2
Pall Mall Exhibition (first account)				7	15	7
Photographic Review of Reviews Charitable Fund				7	5	0

Photographic Convention United Kingdom	5	0	0
Amateur Photographic Society of Madras	2	2	0
Hastings and St. Leonards Society	2	2	0
Photography Competitions	2	0	0
Hackney Society	1	13	6
Central Club	1	0	0
Balance due to Secretary	6	18	11
Total	£596	11	8

Expenditure.	£	s.	d.	£	s.	d.
Grants and Loans	143	17	4			
Printing and Stationery	8	13	7			
Postage and Petty Disbursements	3	14	6			
				156	5	5
Pension Fund in 2¾ per Cent. Consols	250	0	0			
Interest on Pension Fund in Post Office Savings Bank	22	3	11			
Balance at Bank	162	12	4			
				434	16	3
Cash in hands of Treasurer				2	2	0
Balance due to Secretary, 1892				3	8	0
Total				£596	11	8

Audited, compared with vouchers, and found correct, January 30, 1894. THOMAS BEDDING. J. GUARDIA.

THE LATE A. M. LEVY, C.E.

IT is with great sorrow that we have to record the death of Mr. A. M. Levy, who was taken from us by consumption on Monday, February 19, a the early age of thirty-nine. The deceased gentleman was by profession a mining engineer and metallurgical chemist, and was regarded as an expert in copper refining, upon which subject he was the author of a text-book that is accepted as a standard work in Belgium. In his earlier years he had a brilliant career at the University of Liège, where he obtained his degrees with great distinction. He was, in short, a man of singularly high and varied attainments, and, had he lived, would, we are sure, have achieved great scientific eminence.

In the photographic world he was warmly esteemed for his genial and amiable character, as well as for his readiness to draw on an extensive chemical, physical, and general scientific knowledge for the benefit of those who sought it. He was one of the Council of the Photographic Convention of the United Kingdom, of which he was a firm supporter, and also enjoyed membership of the London and Provincial Photographic Association and the Photographic Club. A reference to the Annual Reports of the last-named body for several years past will show that he was deeply versed, not only in the science, but in the practice, of photography, and that he was always willing to be of assistance to others with his experience and suggestions. Our own pages were, on several occasions, the vehicle of his utterances on photo-chemical topics, which were always characterised by great lucidity and charm of style. Undoubtedly he is a great loss to photography, not only for what he was, but also for what those of us who enjoyed the privilege of his intimacy hoped and believed he would be, and who knew that, behind a veil of the purest modesty and reserve, he concealed an intellect of rare cultivation.

The remains of our late friend were interred at the Jewish Cemetery, Willesden Green, on Thursday, February 22, when, in addition to the family mourners, the following of his photographic *confrères* attended to pay the last tribute of respect to him:—Messrs. Frank Haes, F. A. Bridge, E. W. Foxlee, Thomas Bedding, R. Child Bayley, James A. Sinclair, and G. W. Tottem. The members of the Photographic Club had also sent a wreath.

News and Notes.

TO-NIGHT (Friday, March 2) Mr. C. F. Robinson, of the Carlotype Company, will give a demonstration at the Central Photographic Club of mezzotype and other rough-surface papers, which will be followed by a lantern show of members' work. Membera are requested to bring slides.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—The Fifth Annual Dinner of this Society was held on the 23rd inst., when forty-three members and friends took part. The visitors included Mr. J. Traill Taylor, Mr. W. E. Debenham, and Mr. R. Child Bayley. Mr. Debenham, in the regretted absence of the Judges, distributed the certificates awarded at the late Exhibition. Mr. Traill Taylor indulged in some interesting reminiscences in responding for the toast of the Press. Mr. Child Bayley proposed the toast of the North Middlesex Photographic Society, and spoke in somewhat flattering terms of the work and energy displayed in its career. The President (Mr. Marchant), in responding, likened the Society to a republic in its best form, where everybody was equal, in fact as well as in name, and where every one worked for the good of the whole body, and not for that of individuals or cliques. A most enjoyable musical programme was carried out, and when the hour of departure arrived "Auld Lang Syne" nearly raised the roof, and everybody sang it as though they meant it.

THE Aston Natural History and Photographic Society's Exhibition will be held in the Burlington Hall, High-street, Aston, on Thursday, Friday, and Saturday, April 5, 6, and 7, 1894. The following is the schedule of classes and awards:—Open classes and for professional members. 1. Portraits. 2. *Genre* and Figure Studies. 3. Landscape. 4. Instantaneous. 5. Architecture. Open to amateur members only. 6. Landscapes, any size, awards go to best exhibit (one picture, one medal). 7. Enlargements, any size, awards go to best exhibit (one picture, one medal). 8. Series of three pictures, any subject, half-plate and above. 9. Series of three pictures, any subject, 5×4 and under. 10. Series of three quarter-plate pictures. 11. Series of six lantern slides, each series to bear same mark and to be properly labelled and mounted. 12. Instantaneous. A picture (painted and presented by Mr. C. T. Cox) will be awarded to that member of the Society who, in the opinion of the Judges, exhibits the best picture, of whatever size, subject, or process. The Hon. Secretary is Mr. F. W. Pilditch, 133, Wills-street, Aston.

"THE LOWEST DEEP."—We clip the following advertisement from a lay contemporary:—"The Society for the Promotion of Photography, in order to encourage the practice of this fascinating and refining amusement in every home, will send each novice (male or female, irrespective of age), free of charge, a new magazine hand camera carrying twelve plates in metal sheaths. This wonderful camera (taking instantaneous *carte-de-visite* portraits or views) is not a loan, but an absolute gift from the Society to those anxious to learn the rudiments of this beautiful art, therefore skilled photographers are not eligible for this free gift, but must purchase at full price. The Society, moreover, in order to encourage proficiency, will issue with each camera twelve coupons, entitling the beginner to participate in twelve monthly distributions of above valuable prizes, which will be given (according to merit) for portraits or views produced by the apparatus. A book of instructions enabling even a child to learn photography and obtain a valuable prize will be sent with each camera, and the name and address of winners published each month. One thousand cameras are now ready for distribution, therefore apply at once, as this generous offer of the Society may not be repeated. Note.—Clergymen, schoolmasters, and opticians supplied with one dozen for judicious distribution. Each applicant for a camera must enclose 1*s.* 6*d.* to prepay parcel-post charges, and for dry plates, coupons, and instruction book."

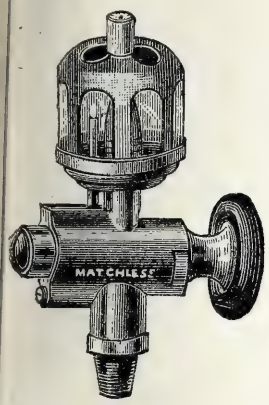
HACKNEY PHOTOGRAPHIC SOCIETY'S DINNER.—The First Annual Dinner of the Hackney Photographic Society was held on Thursday, February 22, at the City Arms, St. Mary-axe, E.C., the President of the Society (Mr. F. Houghton) being in the chair. About sixty members and visitors were present, and the affair passed off with great success. Replying to the toast of the Society and its Officers, Mr. W. F. Fenton-Jones, the Honorary Secretary, made an appreciative speech, from which we gathered that the Society is in a prosperous and healthy condition. Mr. John Howson replied for the "Visitors," humorously styling the Hackney Society the "Wise Men of the East." Mr. J. Traill Taylor acknowledged the toast of the "Press," and took occasion to remind his hearers that, in St. Mary Axe, Mr. George Shadbolt, a former editor of this JOURNAL, from whom he (Mr. Taylor) had acquired a great deal of knowledge, had his place of business. The "Chairman" concluded the toast list. Among those who contributed to the post-prandial amusement were Messrs. S. Moore (pianoforte overture), Gosling, Smith, Fenton-Jones, Bentley, Welford, Puttock, Lloyd, Farne, Cross, who gave songs; Augustus W. Wilson, S. H. Hill, Thomas Bedding, Snowden Ward, T. Fall (recitations), Leopold (sleight of hand), and T. H. Smith (accompaniments). Mr. W. E. Debenham revealed possession of an unexpected fund of melody and humour by singing an amusing parody of *Old King Cole*, of which the last verse had some photographic point. It ran as follows:—

"Old King Cole was a superior old soul,
A superior person was he,
And he went, as superior persons do,
To the Dudley Gallerie.
And the æsthetes and the impressionists came
With their artistic photographee,
But the picture, as he thought, of an old birch broom,
Was the High Art idea of a tree."

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of Delegates, February 20, 1894, Mr. E. Clifton (Photographic Club) in the chair.—A letter was read from the Superintendent of the Great Northern Railway, stating that the subject of concessions to photographers had been discussed at the meeting of the Committee of Railway Managers, and that they were unable to make any departure from their present arrangements. A letter from the Hon. Secretary of the Photographic Society of Great Britain was also read to the effect that the previous communication from the Committee with reference to wall space charges to members of affiliated societies had been referred to the Exhibition Management Committee. The report of the Committee appointed to arrange a programme was then discussed; the first paragraph, which recommended that a series of lectures should be held upon colour photography, and that one of the City halls could probably be obtained for the purpose, was adopted, and the Committee reappointed to carry out the proposed series. On the motion of Mr. Huddy (Richmond Camera Club), seconded by Mr. Warnerke (Photographic Society of Great Britain), it was agreed that an offer should be made to assist local societies in the way of lectures if two or more of them could temporarily amalgamate for the purpose. It was also decided to invite the affiliated societies to make suggestions with reference to Exhibition rules, and that when those suggestions came in the Judges should be invited to meet again, and to take such steps as they shall think fit to admit of their being

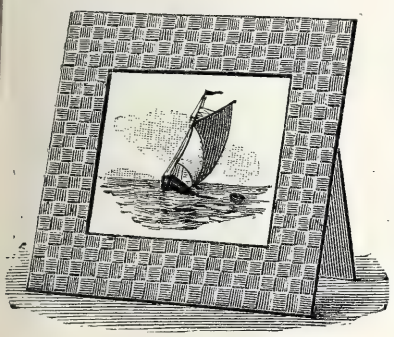
alled together from time to time as occasion may arise. The Secretary having tated in reply to an inquiry that the subscription of the Croydon Camera lub for 1893 had not been paid, it was agreed that one month should be given hem in which to pay it, if not paid at the expiration of which time Rule 7 hould be put in force. The Secretary stated that he had received a number f inquiries from provincial societies with reference to the work of the affiliaion, the interest in which had apparently increased considerably, and that he nticipated a considerable accession of strength in the immediate future.

Our Editorial Table.

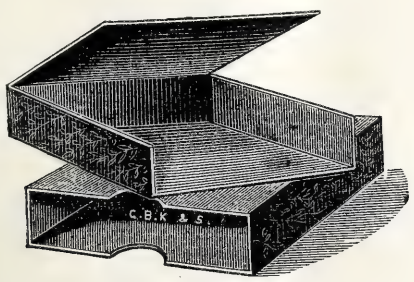


From Mr. W. Bernard, 131, Shepherdess-walk, London, we have received a gas burner of a very convenient kind, for dark rooms. It has a two-way tap which permits the light to be turned down without going out, the faint glimmer being so covered as to prevent injury to the most sensitive plate. It is claimed that it differs in certain respects from others of a like nature that have been for some time sold by photographic dealers.

Messrs. George Houghton & Son, 89, High Holborn, send us samples of two novelties they are introducing. One is a frame, formed of cardboard, for holding opal photographs, and in which they can be inserted without any trouble at all, giving a neat and attractive finish to them; the other is a simple card-frame, *à la* straw-plait, in which to insert an unmounted print. The cut affords a good idea of this latter.



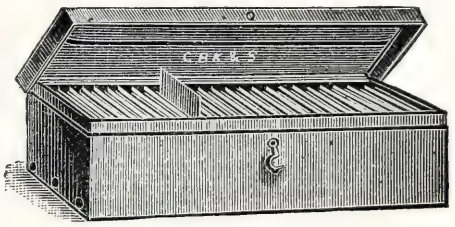
Messrs. G. B. Kent & Sons, 11, Great Marlborough-street, W., have submitted some novelties which will conduce to the comfort of the amateur photographer. One of these is a small pocket-case,



pen at end and having a hin ged lid. This carries a dozen quarter-late negatives in envelopes, on which may be written the subject, he date, light, lens, and so forth. Both the case and a second one, vhich forms a packing-case, are made of stout paper-covered card-oard.

In a companion case for holding film negatives, the envelopes are ll attached to the back, like the leaves of a book. There are 100 f them, and, as each is numbered, one can, by turning to an index, mmediately find any negative contained in the book. For carrying few untoned prints, a pair of thick cardboard covers, like book overs, are provided. Inside are folding flaps of red fabric, to prevent access of light to the prints.

In a box for containing lantern slides the usual grooves at the ides are done away with, and each slide is separated from its fellow y a division of card, each alternate one being a little lower than the other, so as to facilitate insertion. The slides rest upon rubber tubes, a single one also being laid along the top, forming an elastic padding. In all these Messrs. Kent show how effectively cardboard



can be used in the making of light appliances, and how pretty such things look when covered with handsome black paper.

Mr. Otto Schölzig, 31, Binfield-road, S.W., has sent us a sample and particulars of a new emulsion paper he is bringing out. It prints to a good tone.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
5	Camera Club	Smoking Concert.
5	Peterborough	
5	Putney	*Picture-making by Photography.* H. M. Hastings.
5	Richmond	
5	South London	
5	Stereoscopic Club	
6	Birmingham Photo. Society	
6	Bolton Photo. Society	
6	Brixton and Clapham	
6	Exeter	
6	Hackney	Members' Lantern Night.
6	Herefordshire	
6	Keighley and District	
6	Lewes	
6	North London	
6	Oxford Photo. Society	
6	Paisley	
6	Rotherham	
6	Sheffield Photo. Society	
6	West London	*Pose and Lighting in Portraiture.* Martin Jacolette.
6	York	
7	Ashton-under-Lyne	*Photographic Tit Bits at Home and Abroad.* J. W. Kenworthy.
7	Croydon Camera Club	*The Development of Matt and Glazed Gelatino-chloride Prints.* A. E. Isaac.
7	Edinburgh Photo. Society	
7	Leytonstone	Demonstration by the Autocopyist Company.
7	Photographic Club	*Collodion Dry Plates.*
7	Southport	
7	Southsea	
8	Birkenhead Photo. Asso.	
8	Bristol Camera Society	*Platinotype Printing.*
8	Camera Club	*Composite Heliochromy by Three-colour Printing.* F. E. Ives.
8	Cheltenham	
8	Glossop Dale	
8	Hull	
8	Leicester and Leicestershire	
8	Liverpool Amateur	Competition Slides.
8	London and Provincial	
8	Manchester Photo. Society	
8	Oldham	
8	Tooting	*A Photo-mechanical Printing Process.* The Autotype Company.
8	Woolwich Photo. Society.	*Enlargements.* O. J. Ellis.
9	Bristol and West of England	
9	Cardiff	
9	Central Photographic Club	
9	Croydon Microscopical	
9	Halifax Camera Club	
9	Holborn	
9	Ireland	
9	Maidstone	
10	Hull	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

February 27,—Technical Meeting, Mr. J. W. Swan in the chair.

Messrs. W. Watson & Sons showed a strut for giving extra rigidity to cameras, consisting of a rod for attaching to the front baseboard of the camera and the joint of the tripod. The strut also does away with vibration.

Mr. Spiller remarked that in photographing on sandy ground it was desirable to have some means of ensuring rigidity, and Mr. Warnerke thought the same remark applied to smooth-surfaced ground.

The CHAIRMAN said that, by placing a loose stick against the tripod, vibration was lessened.

Messrs. Watson also showed two forms of their well-known "Alpha" hand or stand camera.

Mr. T. E. Freshwater showed several tele-photo views of the Himalayas, taken from Darjeeling, a distance of forty-five to fifty miles. They were considered extremely good, particularly in the rendering of the distant mountains.

"A METHOD OF MODIFYING PLATINUM PRINTS BY AFTER-TREATMENT."

Mr. ALFRED W. DOLLOND read a paper on this subject, remarking that he had tried to intensify platinum prints by depositing a further quantity of metal upon them. The results with ordinary gold toning were promising, the image being strengthened, but many hours were required. Feeble reducing agents and organic substances of a glutinous nature were also tried, with promising results. It was found that glycerine and gold strengthened the image, the colour obtained being a blue black. An alkaline developer reduced any gold that might be left in the print. The method of working finally arrived at consisted of first soaking the finished and dried platinum print in water, and after the removal of the excess of the latter, spreading ordinary glycerine over the print with a brush. A gold solution, two grains to the drachm, previously neutralised, and then made slightly acid with HCl, was then mixed with the glycerine. The image was thus changed to a blue-black tone, the gold being allowed to act while the high lights remained clear, The print is then rinsed in water, and a developer containing metol, sodium sulphite, and sodium carbonate applied. This method increases contrast, more gold being deposited where there is a large quantity of platinum. It strengthens under-exposed prints, and changes a rusty tone into a pure black.

Following the paper, Mr. Dollond gave a practical demonstration of the process, the improvement in prints so treated being regarded as most marked and pleasing.

Mr. E. J. WALL stated that Dr. E. Vogel, in 1887, had tried the precipitation of platinum by development on platinum images with the same object.

In reply to Mr. Warnerke, Mr. DOLLOND said that the method would probably not improve a fogged platinum print.

The CHAIRMAN thought it rather surprising that gold could be deposited on platinum.

Mr. WALL suggested the use of palladium for sepia platinotypes.

Replying to Mr. Child Bayley, Mr. DOLLOND said that gold in glycerine precipitated in ten or fifteen hours.

Mr. J. SPILLER inquired if the gold-toned image had the same resistant qualities to the different acids as images of pure platinum. He thought Mr. Dollond's process gave one a new power over results.

Answering Mr. Chapman Jones, Mr. DOLLOND said the developer had a protective action on the print.

The CHAIRMAN, in moving a vote of thanks to Mr. Dollond, complimented him upon the excellence of the paper and demonstration, and, describing the process as a "gilding" one, elicited from Mr. Dollond the statement that the gold was not simply deposited in the form of gilding, but that it was diffused through the metallic platinum of the image.

PHOTOGRAPHIC CLUB.

FEBRUARY 21,—Mr. John Nesbit in the chair.

Mr. FRANK HAES having announced the death of Mr. A. M. Levy,

Mr. F. A. BRIDGE expressed the sorrow of the members of the Club at the loss, and proposed a vote of condolence with Mrs. Levy. This was seconded by Mr. E. W. Foxlee. On the proposition of Mr. Newell, seconded by Mr. Cowan, it was also decided to send a wreath on behalf of the members of the Club.

Mr. FOXLEE, referring to the demonstration of the Photo-autocopyist given at the previous meeting, said on that occasion he had mentioned that the parchment paper used was liable to cause distortion. He had brought a sheet of the paper with him, and would cut measured strips from the length and breadth, and would wet them, and then measure them to see the extent of the expansion. Mr. Foxlee then cut strips off the paper and wetted them, and it was subsequently found that the nineteen-inch strip cut from the web way of the paper had lengthened a quarter of an inch while wet, and that it stretched to nineteen and three-quarter inches, and that the strip from the width would stretch from twenty-two inches to twenty-three and three-quarter inches.

VARIATIONS IN PRACTICAL STEREOGRAPHY.

Mr. THOMAS BEDDING read a paper on this subject, showing a number of prints in illustration of the points touched upon, also a stereoscope by Husbands, of Bristol, having vertical and axial adjustments of the lenses.

The CHAIRMAN, in the course of the discussion that followed, thought that the lenses on the camera should be nearer than the centres of the pictures.

Mr. FRANK HAES said that excessive distance between the centres of the lenses gave a painful effect when viewing the pictures.

The CHAIRMAN advised having means for adjusting the lenses on the camera front.

Mr. W. E. HALSE, remarking that it was easier to make transparencies than paper slides, showed a number of transparencies he had recently prepared. He had only lately taken up stereoscopic photography at the suggestion of the Chairman.

Mr. A. COWAN recommended the method of folding the paper in printing from uncut negatives, which would give the prints properly reversed as regards right and left.

Mr. G. W. TOTTEM remarked that very few commercial stereoscopic views were cut and mounted correctly.

Mr. FOXLEE quoted Mr. Ackland as saying that, when parallel lenses were used on a twin camera, the stereoscopic effect was different to when the oblique-lens system of Latimer Clark was employed.

Mr. HAES mentioned a case where one lens on a certain stereoscopic camera was found to be three-eighths of an inch shorter in focus than the other.

The CHAIRMAN stated that he had seen a stereograph of a geological specimen photographed with the lenses separated by a distance of only an inch, which gave a satisfactory result owing to the nearness of the object. He also referred to De la Rue's stereograph of the moon, the two negatives for which were taken thousands of miles apart. In reply to Mr. Haes, he said he thought a half-plate the best size for stereoscopic work, with the centres at three inches. That separation was only useful for landscapes, and not for portrait or close work.

Mr. J. R. GOTZ described Helmholtz's tele-stereoscope for seeing objects at a distance of several miles. The two pictures were taken with a separation of several yards between the lenses, and the images were reflected by mirrors to the normal distance, when they could then be seen stereoscopically.

Brixton and Clapham Camera Club.—February 20, Dr. Reynolds (President) in the chair.—A paper was read by Mr. F. GOLDBY on the *Collodio-bromide Process*, and a demonstration by Mr. BUTLER followed. Slides during the demonstration were afterwards passed through the Club lantern. Mr. Taylor, of the firm of Taylor & Green, attended and explained his electric developing and cycle lamp.

Central Photographic Club.—February 23, Mr. G. H. James in the chair.—Mr. SNOWDEN WARD opened the proceedings with a short sketch of the life of Mr. A. H. Wall, and, in consequence of that gentleman being unable to be present, his paper, *The Beginning of Artistic Photography*, was read by Mr. Snowden Ward. Mr. TEAPE said he was pleased to find Mr. Wall associated the beginning of photography with the beginning of art. The earliest experimenters in photography were accomplished artists, and as such they brought their art to bear upon their productions. Some of them thought blurred images increased the distance and space in the picture, while the foreground was produced sharp. He pointed out that a lens stopped down produced more detail than the eye saw. Mr. DEBENHAM had argued that things should be delineated as the eyes saw them. After some discussion on the question of sharpness and difference of focus, Mr. W. E. WARD contended that there should not be any absolute rule, but there should be some play for judgment. The first thing that was impressed upon him when he learned photography was that he should carry a microscope. When sharpness and definition are carried almost to a law, it was very objectionable. Mr. MCEWEN pointed out that most people judged pictures by their sharpness. Some photographers had gone in the opposite direction, but too far, but he thought they had done some good. He considered that there should be something in focus for the eye to rest upon, and the remainder dealt with to give the appearance of atmosphere. There had been attempts to render the broad effects of the painter on a small scale, but they had failed. Mr. FENTON-JONES thought there was right on both sides. The principal object should be sharp, and the distance rather out of focus. In his hand-camera work he used the *f*-8 stop. The CHAIRMAN said he had expected to hear that artistic photography originated in 1893 with the Salon. It was generally considered that pictorial photography was just starting. Mr. Wall had shown that it initiated very many years before.

Croydon Camera Club.—February 21, Annual Meeting.—A proposition, made by Mr. Nathaniel Waterall, that an annual dance of members and friends should be held, was referred to the Council. The following officers and Council were elected:—*President:* Mr. Hector Maclean, F.G.S.—*Vice-Presidents:* the Hon. Sidney Herbert, M.P., Mr. Ald. Foss, J.P., Mr. Ald. F. T. Edridge, J.P.—*Council:* Messrs. W. Burns, G. Corden, W. F. Frost, A. E. Isaac, J. Noakes, J. Packham, J. Smith, D. Waller, and W. Wreford.—*Hon. Secretary:* Mr. G. R. White, 55, Albert-road.—*Hon. Assistant Secretary and Librarian:* Mr. H. E. Holland. Some minor alterations having been adopted, arrangements were made for holding two whole-day excursions on Good Friday, one party proceeding to Dorking and another to Crawley. In June a tour will be held, consisting of a week in Holland. A fine collection of prints, lent by the President, was arranged on the walls, including choice examples of the works of Messrs. Byrne, Tagliaferro, Lyd. Sawyer, A. Diston, J. Lord, Sarony, Mrs. Cameron, and many other eminent exponents of "figure photography."

Ealing Photographic Society.—February 15.—The announcement that Mr. Charles Whiting would give a lecture on *Stereography*, and that Mr. Dovaston, who has made a speciality of stereoscopic work, would also be present, brought together a large audience. Four new members were elected, and a letter from the Photographers' Benevolent Association was read acknowledging the Society's "munificent" contribution to the funds of the charity, arising out of the recent lantern show. Mr. WHITING introduced his subject by quoting the definition of Hardwich—that "an object may be considered to be stereoscopic when it stands out in relief and gives the impression of solidity." As explaining many of the phenomena of vision, he called special attention to the axiom that "the mind always refers the place of an object to the point where the optic axes meet." He mentioned as an interesting fact that, by looking at them crosswise, the double pictures produced for viewing in the stereoscope can be made to yield a stereoscopic image without the aid of that instrument. He next described Wheatstone's reflecting stereoscope, the advantage of which was that it could be used for viewing large photographs. Owing to its cumbersomeness, however, it had been supplanted by the refracting stereoscope, invented by Sir David Brewster. For taking stereoscopic pictures a double-lens camera was by no means indispensable; indeed, in some circumstances, a truer stereoscopic effect could be obtained by taking pictures from slightly different points of view with a single-lens camera. Mr. Whiting explained the method of doing this by means of a board with slightly convergent "guides" screwed on the tripod. The lecture was illustrated with diagrams, and a number of stereoscopes and slides, &c., were provided for the use of those present. Many of the slides were the work of Mr. Whiting himself, others were produced by Mr. Dovaston, who also showed and explained the camera used by him for the purpose. The camera was convertible into an ordinary half-plate camera, and was adapted for use either on a tripod or in the hand. Amongst Mr. Dovaston's slides were a number of successful street scenes taken from the hand.

Hackney Photographic Society.—February 20, Mr. E. Turner in the hair.—Mr. Dean showed some photo-micrographic work. Messrs. A. Barker nd Gosling showed results on "Kloro" paper. They found it to be excellent, printing quickly, and not losing much in toning. Mr. Ancell also showed vork. The HON. SECRETARY inquired as to the advantage of separating the enses of stereoscopic cameras farther apart than three inches, or the distance etween the eyes. It was explained that this was necessary in order to obtain tereoscopic relief when the object photographed was far distant, and there was no prominent foreground. In some cases relief was obtained by taking he views very far apart from each other, as, for instance, in stereographs of the moon, when the pictures were taken from points of view amounting to some thousands of miles apart. Mr. Hudson asked for an opinion as to the best set of lenses for a half-plate camera. The HON. SECRETARY said that lenses of respective foci of eleven inches, eight inches, and twelve inches were recommended by Crouch, but he thought that six inches, nine inches, and twelve inches would be better. Mr. OAKDEN thought that six inches was not short enough for the widest angle lens, and his selection would be four inches for short focus, eight inches for medium, and ten and a half inches to twelve inches for long focus. Query: best focal length for quarter-plate hand-camera lens? Mr. HUDSON uses four and three-quarter inches and five inches. Mr. R. BECKETT said that, according to Dallmeyer, the focus of lens should be equal to one and a half times the length of base line of the picture. Mr. CARPENTER uses a lens of five inches focus, and thought it a fair average length. The CHAIRMAN, referring to a twin lens hand camera, inquired as to whether or not it was necessary to have both lenses alike, or whether a rapid rectilinear lens could be used with a view lens, the latter to be the finder. The HON. SECRETARY thought that the two lenses should be accurately paired. Mr. R. BECKETT said that, inasmuch as the largest working aperture of a single combination is *f*-11, and that of a rectilinear *f*-8, the two would not work together satisfactorily in all cases, for, under circumstances which require *f*-8, as in a dull light, the finder lens working at *f*-11 would not show the view plainly enough. Therefore he advised the best rapid rectilinear procurable for projecting the image on the plate, and a cheap doublet of the same focus, working at *f*-6 or *f*-8, for the finder. Mr. C. H. OAKDEN then read a paper on *Photo-micrography*, and treated his subject in a very painstaking manner. A brief summary is as follows:—The person to whom is due the honour of first using photo-micrography is unknown, but its discovery was coincident with that of photography. Sir Humphrey Davy made some photo-micrographs, but as these were produced prior to the discovery of a fixing agent, they have not been preserved. It is a subject that has been much neglected, but now signs of reviving interest are shown. For this work a good microscope is necessary. The operator should be used to the manipulation of the microscope, be able to prepare his own slides, and have a general knowledge of photographic work. The microscope should have a heavy foot, the tripod form being best, although the horseshoe shape is preferred by some workers. The stage may be plain or mechanical, the latter being a luxury. A sub-stage is essential, and should be fitted with diaphragms—iris preferable—Abbé or achromatic condenser (the former would do), and stops for dark-ground illumination. The lenses should be the best obtainable. There should be a draw tube and coarse and fine adjustment. An inner tube of black velvet should be fitted to prevent reflection. For occasional workers an ordinary half-plate camera would do as well as a special apparatus. The lens flange should be fitted with an adapter to receive the eyepiece of the microscope. The focussing screen should be of finest ground glass, and, in addition, some micro-cover glasses should be cemented with balsam on to the screen, and fine definition obtained by a focussing glass. As to the illuminant, for low powers up to 500 diameters oil is quite efficient. Any lamp with half-inch wick will do. Good plates, thickly coated, are necessary, and they should be backed. Isochromatic plates are absolutely necessary for some stained preparations. Exposures vary, and knowledge thereof can only be gained by experience. Mr. Oakden uses glycin for developing, and finds it very suitable. Gelatino-chloride paper or smooth platinotype may be used for printing. In conclusion the worker must beware of dust and vibration, for these are the photo-micrographer's bugbears.

Leytonstone Camera Club.—February 21, Mr. G. E. Cox in the chair.—Mr. TOM SYMMONS gave a lecture entitled *Photography in a Nutshell and How to Crack it.* The lecturer, in opening, wished to be excused for the somewhat spicy title of his lecture. No doubt many of the members wondered what was meant, but he hoped that he would be able to justify his title before he had finished. He and no doubt many other members were continually being worried by anxious beginners as to what was the best form of apparatus to go in for: "What do you think of Pyro & Co.'s knock-'em-out set?" or whether you have had any experience with the Demon camera. It was difficult to advise without knowing what the ultimate wishes of the inquirers were. There were some who intended to go in for photography thoroughly; there were others who only wished to sip at it, as it were, such as the cyclist and the busy man, who had not the time to give to it, but would like to show something in the way of a record of what they had seen; there was the artist, to whom photography was most useful, but who did not acknowledge it—all anxious to have an outfit in which there was not trouble in the manipulation, and nothing approaching the form of luggage to be carried about, and such was the nature of what he wished to introduce that evening, which truly fulfilled these conditions, and gave all that could be desired in a satisfactory result. It was known by the name of the Binocular Camera, and was a perfect instrument. The set he was showing them that evening had been purchased by Mr. Melton Prior, the War Correspondent, and was the realisation of a wish expressed by Mr. Prior some years ago for a camera that was always ready, and at the same time would not be too bulky, so that it might always be in attendance if required to be used on horseback, or under almost any condition under which an exposure could be made; these were all embraced in the instrument he was showing them that evening. The finder was unique, there being two lenses side by side, and the subject was viewed through red clear glass, so that the object could be perfectly seen right up to the moment of firing the shutter. There was another advantage to his mind, that the instrument was held at the proper elevation, and the views taken as our eyes see it. He considered the various positions in which hand cameras were held gave a false perspective. It was also impossible to expose a plate twice, as the last plate exposed could be brought to view, and the number being on the back of the sheath would show the position of affairs. It was made to contain one dozen plates or thirty films, and the mechanism of the changing was perfection, which he amply testified by changing the whole contents two or three times without a hitch. Although the size was small, it was capable of turning out some of the best of work, as negatives and prints which were passed round showed, some of which he had taken himself, and the makers had followed out the matter thoroughly, as a complete set of apparatus, consisting of printing-frames, baths, washing and drying racks, lantern-slide making frame, clips, &c., and last, though not least, a complete enlarging apparatus up to half-plate, making most perfect enlargements and enlarged negatives, some prints from which were exhibited, showing that it was possible to obtain from the very small inconvenience of carrying what appeared to be an opera-glass slung across the shoulder, which fully justified Mr. Symmons's title of "Photography in a Nutshell." It was the smallest apparatus yet been exhibited capable of turning out first-class work. He also exhibited a new tripod stand, not yet upon the market, called the "Compactum," being in bulk little more than a roll of music in a japanned case, but opening out into a metal stand of perfect rigidity and utility.

Putney Photographic Society.—February 22, Dr. W. T. Sheppard in the chair.—Mr. G. ARDASEER, of the Richmond Camera Club, read a paper on *Home-sensitised Paper.* He commenced by saying that the process was most simple, easy of performance, and successful in result. Nearly every kind of surface was at command, ordinary note paper, Rive, Saxe, or Whatman; or in fact, if necessary, or if one felt very fuzzily inclined, the most sickly yellow of canvasses could be pressed into service, and would perhaps secure a medal. Again, and this was a distinct advantage, the preparation of the paper could be varied to suit the negatives. The weak ones could be made to yield prints of a quality which it would be hopeless to attempt when using a paper ready sensitised for the negative of normal intensity; the prints from harsh negatives could be toned down in contrast so as to give soft and delicate effects. The two points of almost unlimited choice of surface, and the power of adapting the preparation of the print to the negative, were of the greatest importance to the earnest worker. The following simple materials were all that were necessary for the practical working of the process:—Paper, common table salt, or, preferably, ammonium chloride, citrate of soda, arrowroot, gelatine, or other sizing, nitrate of silver, and distilled water. A salting and sizing bath was made up as follows:—100 grains arrowroot were mixed with a little water to a paste, over which boiling water was poured until it turns (like starch) making up the bulk to 8 ounces; 200 grains ammonium chloride (or 218 grains table salt), and 20 grains citrate of soda were dissolved in 12 ounces of water; when dissolved, add the thinned arrowroot, and the solution is ready for use. Into it the paper to be salted should be plunged bodily and left in for a minute, after which it should be removed by one end and drained over the end of the dish, and hung up to dry by one corner. When dry, the paper can be stored away, and will keep indefinitely. The paper should be marked on the side not to be sensitised. The paper should be sensitised only a short time before being used, as it would then not keep many days. The sensitising might be done in two ways, viz., by floating or by brushing; if the paper were fairly smooth, floating would be preferable, but, if rough, brushing would be the better means. A soft camel's-hair brush, fairly large, would be found convenient, care being taken that no wire or other metal came into contact with the silver bath. The ingenious brushes introduced by Buckle and Blanchard combine extreme simplicity with efficiency; the former consists of a tuft of cottonwool held in one end of a glass tube, the latter of one or more thicknesses of flannel doubled round the edge of a small glass plate, such as is used for lantern slides, and held in place by a rubber band placed about an inch above, and parallel to the edge, care being taken that the rubber does not come in contact with the bath. The cottonwool and flannel could be renewed when necessary. A suitable sensitising bath for the salting bath given above would consist of sixty grains of nitrate of silver to the ounce of distilled water. Mr. Ardaseer gave several other formulæ for the salting and sensitising baths, but he thought those described above would perhaps be found most satisfactory on account of their simplicity and general utility. As already stated, the strength of the solutions had much to do with the result: strongly salted papers must have strong sensitising baths, and are useful for giving contrasts; as much as a twelve-grain salting bath and 100-grain nitrate of silver bath might be used with advantage for very weak negatives. The method of salting and sensitising needed attention: when salting by immersion and sensitising by floating, the proportion of salt to silver should be one to thirty; when the paper was salted by floating and sensitised by brushing, the proportion should be one to twelve. For very hard negatives the baths should be proportionately diluted. Mr. Ardaseer showed some very interesting and beautiful specimen prints taken on different kinds of paper, and pointed out that prints prepared by this process could be very successfully toned with platinum, as there was no tendency to degraded whites, as was almost always the case with ready-sensitised papers when this toning bath was used. A hearty vote of thanks to Mr. Ardaseer, for his kindness in placing the subject before the Society in so complete and interesting a form, concluded the proceedings.

Richmond Camera Club.—February 19.—Mr. CEMBRANO (the President) showed the second portion of his series of Spanish slides to a fair muster of members and their friends. The slides shown comprised views of the Alhambra and in and about Grenada, with several studies of peasants, gipsies, &c. Needless to say, they were technically perfect and of great artistic merit. Each scene was described in an interesting manner by Mr. Cembrano, who strongly advised his hearers, whether photographers or not, to make a winter trip to the south of Spain, and gave them many useful hints to help them on their way.

South London Photographic Society.—February 19, the President (Mr. F. W. Edwards) in the chair.—Samples of "Kloro" paper were distributed, and it was arranged to have a competition among the members receiving same. Mr. H. SNOWDEN WARD gave a lecture, entitled *A Trip to the States*, illus-

trated by lantern slides. Several Atlantic sunsets were first shown, followed by slides typical of life on board the ocean liners. Various views of New York were thrown on the screen, the height of the houses evoking considerable astonishment. The lecturer stated that the whole of the New York police bore a remarkable resemblance to each other, and that it was said that they were all cast in a special mould. They were all of Irish extraction, and he said that nearly all the Irishmen who went to America became policemen. The long strings of cars were a great feature of New York life, and, on account of them, it was often difficult to cross the road. The famous Horse-shoe Curve was shown with a train coming round the bend. Washington was next visited, and the broad avenues, lined with trees, were much admired. Chicago and the Exhibition was seen in all their glory, two views of the illuminated buildings, taken at night, being specially interesting.

Tooting Camera Club.—February 22, Mr. Anderson in the chair.—Experiment with Eastman's platino-bromide paper by the Secretary. The paper used was the soft brand C recommended for general work. Mr. CHILD (the Secretary) ssid the directions gave the oxalate developer, and said nothing about other kinds; but he proposed that they should try hydroquinone, as he had always been able to obtain the same results with that as with iron. If it failed, he had all the necessary materials for the latter one, and he would then try that. The form of the developer was the same as he had used on previous occasions. It was rather a slow one, and on that account required no restraining, although, if thought advisable, a ten per cent. solution of potassium bromide or the No. 2 solution might be used. A piece of paper was exposed for about ten seconds two feet from a round-wick oil lamp (of about thirty or forty candles), and then developed. The development proceeded very slowly, a fact Mr. L. E. Morgan pointed out was no doubt due to the coldness of the solutions. The print was successfully developed, fixed, washed, and then dried by means of a spirit bath, followed afterwards by an ether one, the latter operation being conducted in the open air. When dry, it was passed round for inspection. Mr. MORGAN did not think that the result was other than could be obtained on ordinary bromide paper, but Mr. BERGER said that he had never seen a bromide print equal to it. Mr. CHILD said the tone and appearance were very similar to those of a print on Dr. Hesekiel's printing-out platinum paper, the general opinion being that Messrs. Eastman's paper was a distinct advance in bromide paper. The toning bath was advised and tried, but failed, perhaps because of lack of time.

Woolwich Photographic Society.—February 22, Mr. W. H. Dawson in the chair.—There was a good muster of members and friends. As usual, the first half hour was spent in the disposal of routine business, questions, &c., and included the election of one new member. The main feature of the evening was the lantern display, and a large number of slides, prepared by members, were first shown.

Derby Photographic Society.—February 20, Mr. R. Keene in the chair.—Four new members were elected, viz., Messrs. Bailey, Bassano, Bennett, and Hyde. Messrs. Taylor, Taylor, & Hobson had on exhibition the new standard lens flanges, which were much admired. Mr. H. PICKERING (Hon. Secretary Leicester Photographic Society) next gave a demonstration entitled, *Gelatino-Chloride Emulsion Making.*

Leeds Photographic Society.—February 19, Social Evening.—A large number of the members and their lady friends were present. The rooms of the Society and the Committee-room of the Mechanics' Institution were utilised for the occasion, and a large collection of the work of the members was on view in the shape of prints, enlargements, lantern slides, and transparencies. The company were received in the Committee-room by the President, Mr. J. H. Walker, and the Committee, and tea was served for an hour or so, after which an adjournment was made to the Society's own rooms, where the President delivered his inaugural address for the session 1894. Amongst other remarks he congratulated the members on the fact that, during the past year, the Society had not only maintained but increased its membership, notwithstanding that a new Society having the same objects had been founded in the City, and had obtained a large following. He also called attention to the excellent syllabus for the year, and again repeated the appeal of the Society for the co-operation of lady amateur photographers, of whom there were known to be many in Leeds. As a result two ladies present consented to be nominated for election as members. The next meeting, on March 1, will be a Members' Lantern Evening, with a discussion on *Apparatus* intended to be of use to beginners, for the benefit of whom several lectures on various branches of work have been arranged during the year.

Liverpool Amateur Photographic Association—February 22, the President (Mr. Alfred Tyrer) in the chair.—Mr. JOSEPH EARP exhibited and explained an ingenious arrangement for correcting distortion in architectural subjects. A lecture entitled *Cities of Old Flanders* was given by Mr. E. M. TUNSTALL, and was illustrated by lantern slides made from negatives taken during a tour in the Netherlands.

Sunderland Photographic Association.—February 14, Mr. W. Milburn (President) in the chair.—Mr. S. HERBERT FRY gave a lecture and demonstration on *The Development and Toning of Paget Printing-out Papers and Lantern Slides.*

Edinburgh Photographic Society.—February 23.—Mr. J. C. OLIPHANT' V.P., described a selection from the members' work taken during the past year, 1893, numbering about 180 slides. In his opening remarks he mentioned that they would be shown by the Society's new lantern, they having lately acquired one of the best examples of that useful and necessary instrument. The focus of the lens used must be longer than those heretofore used, as the pictures are hardly on so large a scale as heretofore. The method of changing the slides and perfect focussing was all that could be desired, as was also the steady illumination throughout. In so large and miscellaneous a set there were, with all the winnowing that the large number sent in had been subjected to, by far too many which were neither good as examples of slide-making, nor of having any but the faintest attempt at artistic selection of subject, or, indeed, anything but that they were accidental snap-shots, of no interest save to the person taking them. This is not as it ought to be. Pictures for public exhibition should be of public interest. There was considerable difficulty in following Mr. Oliphant's story, his remarks being addressed rather to his notes than to his audience, so that the names of the various exhibitors and subjects were almost inaudible. The style of work, however, of such men as Lamond Howie, Mitchell, Patrick, Patterson, Reid, of Wishaw, and others, were sufficient to mark out their exhibits whenever projected on the screen, and all that were meritorious were well received and applauded.

Photographic Society of Ireland.—February 22, Mr. J. H. Woodworth in the chair.—Mr. R. M. INGLIS gave a lecture entitled *A Holiday in the Highlands*, which was illustrated by a collection of lantern slides. This lecture was the outcome and description of a most enjoyable tour made by Mr. Inglis in Scotland last summer, accompanied by his camera. Several fine and pretty subjects were taken at various picturesque spots, such as are found in the islands of Islay and Arran, along the Kyles of Bute, and in the Highlands. The camera used by the lecturer was a half-plate, fitted with an Eastman roll-holder for films, and all the slides shown were reductions from film negatives, and were everything that could be desired. Mr. Inglis is a thorough believer in films, and no doubt in his hands they prove most successful, as all the work shown was well up to the standard of excellence. After the usual routine of the business had been gone through, the election of ten new members took place. The roll of membership is this year increasing in this Society. When the Photographic Convention meets in Dublin next July, it will be well supported by a large number of the members of the Photographic Society, besides the members of kindred societies in Dublin.

Hobart (Tasmania) Photographic and Art Association.—January 15, Mr. R. Henry in the chair.—A large album of photographs and a home-made camera back were shown by Mr. H. J. Buckland. Mr. W. K. Morris exhibited a number of very nicely finished opalines, as well as an ingenious table polariscope. The stereoscopic photographs shown by Mr. F. J. Paterson, prepared upon glass, had a splendid effect. Mr. G. Yeates brought under notice an elaborate collection of lantern slides, which were much admired. The photomicrographs by Mr. W. Burnet-Poole, of Adelaide, were pronounced to be the most perfect specimens ever exhibited in Hobart. It was announced that the annual competition would take place in April; the lantern-slide competition to be decided at the May meeting.

FORTHCOMING EXHIBITIONS.

1894.		
March	.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
,,	26–28	*Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.
April	13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,,	16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3499.—"Improvements in Combination Portable Photographic Cameras and Apparatus in connexion therewith." W. J. SPURRIER.—*Dated February*, 1894.

No. 3551.—"Improvements in Cameras and Lenses for Photographic purposes." H. R. HOGBEN.—*Dated February*, 1894.

No. 3605.—"Improvements in Apparatus for Drying Photographic Plates, Films, and Papers, and suchlike articles." F. ILES.—*Dated February*, 1894.

No. 3701.—"Improvements in Instruments for Calculating Photographic Exposures." R. W. SAVAGE.—*Dated February*, 1894.

No. 3786.—"Improvements in Photographic Dark-room Lamps." J. M. TIMMIS and W. H. SMITH.—*Dated February*, 1894.

No. 3958.—"Improvements in or relating to Photographic Hand-cameras." L. A. FRANKS.—*Dated February*, 1894.

No. 3966.—"A Mode of, and Apparatus for, the Production of Stereoscopic Photographs with a Single-lens Camera." T. BROWN.—*Dated February*, 1894.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

TOWN AND COUNTRY.

To the EDITOR.

SIR,—I write to record what I consider to be a strange and interesting fact concerning the present status of professional photography in London. I occupy a somewhat leading position (as far as premises and quality of work are concerned) in a main thoroughfare of a flourishing, moderately wealthy, and certainly populous suburb. In my large and handsome

show-cases I exhibit (amongst the usual small work) highly finished artistic portraits on opal and other specimens in both oil and water-colour, also enlargements in sepia, crayon, and mezzotint, but singular to relate during the whole *six years* of my tenancy I have not had so much as a *single* inquiry respecting them or any other form of enlargement or 'finished picture,' let alone an order. I live (?) or rather *depend solely* upon the receipts from C.D.V. and cabinet work. The *reason* for such utter dearth and indifference on the part of the public I leave, in perhaps better hands than mine, to answer. I merely state a *fact* that may not be uninteresting and without some practical value to our comfortable country cousins whose aspirations would lead them to 'London Town,' where the streets to many even mature minds are thought to be "*paved with gold.*"—I am, yours, &c. "AN EX-COUNTRYMAN."

POISONS ACT.

To the EDITOR.

SIR,—In view of the definite statement which has been made in the photographic journals that it was illegal for any one, other than a registered chemist, to sell sulphocyanide of ammonium, as that chemical was a poison, we have consulted the Pharmaceutical Society on the matter. The following letter received from the Secretary of that Society will at once put the matter at rest, and it will be seen that sulphocyanide of ammonium can be sold freely by any person without risk:—

"I am in receipt of your letter of the 16th inst., and in reply have to inform you that the article to which you refer is not a poison within the meaning of the Pharmacy Act, 1868."

—Yours, &c., THE BRITANNIA WORKS COMPANY, LTD.
Ilford, London, E., February 22, 1894.

A RECENT PATENT.

To the EDITOR.

SIR,—In reply to Walter White's letter in your issue of the 23rd inst., without discussing the question of the validity or otherwise of Messrs. André & Sleigh's patent, I will answer the question which he asks in the last sentence of his communication in the negative. In order to obtain a valid patent, it is necessary (*inter alia*) that the invention shall not have been published, or publicly used, in the United Kingdom prior to the date of application for patent. As to what constitutes prior "publication," depends upon the particular circumstances of the case, and each case must be judged on its own merits; but, as an instance of prior publication in a book, it has been held that the publication of an invention in a German book, to be found in the Patent Office Public Library, was sufficient evidence to vitiate a subsequent patent obtained for the same invention.

It must be borne in mind that a valid patent may be obtained, although, at the same time, it may constitute an infringement of a prior patent; yet the first patent may not constitute such prior publication as to render the second patent invalid, a very slight amount of invention being sufficient to sustain a patent.

Under the present law, the Government gives no guarantee, or suggestion of guarantee, of the validity of a patent; the patent is granted on the applicant's responsibility. For instance, if I like to copy out, say, the specification of Mr. Willis's first platinotype patent, the Patent Office will raise no objection to granting me a patent for it. This may not seem right, but it is a fact.—I am, yours, &c., STANLEY G. S. DICKER,
24, *Tabley-road, London, N.* *Patent Agent.*

To the EDITOR.

SIR,—In reply to Mr. W. White's inquiry in your last number, I beg to say that no *valid* patent can be obtained for any old invention.

I note that Mr. White refers to a certain paragraph in Mr. Burton's book on *Photographic Printing* published in 1887. It may interest him to peruse the following, which appeared in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1884, page 142, three years before Mr. Burton's book, and it has reference to a publication of ideas so long ago as thirty-six years from now.

"In a paper by Mr. C. J. Burnett read before the Edinburgh Botanic Society in March, 1858, on the subject of *Photographic Engraving*, the following interesting facts are recorded:—'As the plan of applying resin powder above the gelatine or other coating before etching would not be likely to answer, we may apply it below, as suggested to me by Mr. Fox Talbot, or *far rather* follow out a plan or plans suggested to me by the shade of fine gauze mentioned by Mr. Talbot as adopted by him in one of his processes. I would recommend a set of fine crossed or uncrossed lines or dots photographically or otherwise produced. We may get very fine lines or dots by photographing on a smaller scale from accurately drawn lines on a much larger scale. They may either be on a separate glass or on the print itself from which we are printing on to the metal; or a little charcoal powder, lycopodium, or other fine powder may be sprinkled on the back or front of the print, or on a separate glass, to be placed above it. The same set of lines, if on a separate glass, may answer for printing from any number of different negatives; and we may make glasses or paper for the same purpose by photographing from a charcoal or other accurately powder-sprinkled surface. This mode of procuring grain will answer equally as well for photo-lithography, or photo-xylographic blocks with gelatine and bichromate, or any of the allied mixtures already alluded to.'"

Comment on the above is not necessary. It speaks for itself.—I am, yours, &c., C. W. CROSSLEY.
St. Mary's Chambers, 14, St. Mary-axe, London, February 26, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Hand-camera wanted; will give a half-plate burnisher, by Rock, in exchange.—Address, D. P. PRIMROSE, Fawcett-street, Sheffield.

Exchange graduated background, 8×6, gate and fence, boat and oar, for violin, banjo, or good poultry.—Address, W. HARE, Windsor Studio, Sutton, Surrey.

Will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY, 1893, unbound, for six quarter-plate printing frames.—Address, G. H. ALLEN, 21, Southgate, Chichester, Sussex.

Will exchange first-class microtone for Wilson's lantern slides of the Western Islands and North Coast of Scotland.—Address, M. W. THOMPSTONE, Brooklands, Manchester.

Wanted to exchange, Dallmeyer's 1A wide-angle rectilinear, 8½×6½, and Eastman roll-holder, 8½×6½, for Adams' Ideal hand-camera.—Address, R. W. ROBINSON, Linkfield-corner, Redhill.

Wanted to exchange, Lancaster's quarter-plate instantograph, with cash, for half-plate similar make, with portrait lens.—Address, HERBERT WOODMAN, Belvedere House, Burnham, Somerset.

Will exchange Russian iron lantern, four-inch condensers, three-wick lamp, &c., all complete, cost 4*l.*, for wide-angle half-plate lens, by good maker, or first-class backgrounds.—Address, M. W. THOMPSTONE, Brooklands, Manchester.

Will exchange for a studio chair and three changing backs, a good collection of over 1100 foreign stamps, mounted in Stafford Smith's Permanent Postage Album, with quantity duplicates and fiscals.—Address, J. P. WEATHERLY, Photographer, Earlston, Berwickshire.

Wanted in exchange for a 9-carat gold albert and locket, weighing over sixteen dwts. a Tylar's Tit-bit hand-camera and sling case of six slides (in leather), or other quarter-plate hand-camera of more value; will make up difference by cash, on approval.—Address, A. F. CLOUSTON, Watchmaker, Stromness, N.B.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

F. LEWIS.—Add more water, or, better, start a fresh bath.

GENTLEMAN FARMER.—You are quite correct. It is a printer's error.

A. E. BAILEY.—The minute bubbles will not interfere with the working of the lens.

GOLD.—Why not try the solution? That is the only way to ascertain if it is still good.

W. WASHAM.—Shall be very glad to hear from you as often as you can find it convenient to communicate.

J. R.—The blue processes are fully described in the editorial article on iron printing in the ALMANAC for 1889.

F. B. J.—Mr. Clarke's address is (or was) 52, Queen's-road, Finsbury Park. We will bear your suggestion in mind.

EQUIVALENT.—With a lens of five inches focus, the distance beyond which objects will be in focus will be *f*-15=14 feet, *f*-20=11, *f*-30=7½, *f*-60=4.

T. BLAKE.—It is not at all likely that the Society would undertake the prosecution for infringement of the copyright, even if you joined as a member.

LENS.—If your camera extends to the required length, there is no reason whatever why you should not use the seven and a half-inch lens on a quarter-plate.

H. H. W.—Certainly use freshly made starch paste in preference to dextrine for mounting silver prints, whether albumen or gelatine. Dextrine as met with in commerce is almost invariably acid, and that might act injuriously on the picture.

C. B. VANDELEUR.—1. We do not think the elimination of the hypo would be accelerated by the method you mention. 2. The address required is the Carlotype Company, Rainham, Essex.

J. W. BUCKLE.—The prosecution in the South of England free portrait case took place, we believe, in the autumn of 1892, there or thereabouts. We cannot recall the exact date.

H. G. CONYBEARE.—We do not know the addresses of the makers named. Probably the goods may be obtained of any of the large dealers in photo materials. Try Marion's. They may most likely also be obtained through printers' material dealers, such as Winstones, Shoe-lane, E.C.

COUNTRYMAN asks us to give suggestions for mending a leak in a gutta-percha dipping bath. — Scrape the surface clean and rub over it some gutta-percha solution, to be obtained at all india-rubber shops, then soften a piece of gutta percha before the fire, and apply as a plaster, pressing it in close contact.

A. W. LEE.—1. Send two copies of the photograph together with 1*s.* 7*d.* to our publishers, and they will effect the registration for you. 2. Ferrous sulphate is the best for precipitating platinum from old oxalate solution. Better use a solution freshly made. See an article on the subject in the JOURNAL for July 22, 1892.

MICRO.—We thought of having an article on the developing of micro-photographs, but the subject is rather devoid of general interest. From the description given it would seem as if you were giving too long an exposure. A short exposure and a longer development will give all the vigour that can be desired. Send us a sample, and we can then judge better.

N. CHEVASSEUR (Melrose, Catford Hill).—There are cameras in the market with focussing finders. They usually have twin lenses. You keep your eye on the ground glass and focus a moving object up to the last moment when the button is pressed. If you call upon any of the principal London dealers you will have an opportunity of examining instruments of this class.

ONE WHO HAS BOUGHT SEVERAL, &C.—1. We have since ascertained that the camera is sold by the Société des Lunetiers, Hatton-garden. 2. Your ideas as to how this JOURNAL should be conducted are excellent, but Utopian. The shutter of the slide in question folds back. 3. We have had no practical experience of the paper you refer to. We shall always be happy to be of assistance to you where possible.

H. S. says: "An amateur friend of mine has asked me to reduce a very intense negative that he has taken. Can you oblige me by informing me in the 'Answers' column of any solution that will do this? I have tried several things, but they do not seem strong enough."—Farmer's solution—saturated solution of potassium ferridcyanide, 1 part; hypo solution 1:5, 10 parts—will answer. It may be used repeatedly.

S. J. W.—If the patent has been sealed, the patentee is entitled to call the thing "patent," although the invention was in use years before the patent was taken out and, consequently, cannot be valid. If the patent is contested and upset, however, he will not be entitled to use the term. Of course, any one can make the contrivance for his own use, or sale, if it was in general use prior to the date of the patent.

R. COX.—We cannot say what the invention is. We simply publish the applications with the titles as they are given in the official journal. The provisional specification is not open to the public until the complete specification is accepted. As soon as it is it can be seen on payment of a shilling. About a fortnight afterwards it is published; then a copy can be obtained for eightpence, or it may be seen free of charge in the Library of the Patent Office.

BLACK AND WHITE says:—"I find that bromide enlargements do not take washes of water colour when working up in black and white. I prefer brush-finished work to stump, powder, and crayon. What is the best method or preparation that will overcome the difficulty?"—Try the effect of washing the surface of the print over with a dilute solution of prepared oxgall, which may be obtained at any artists' colourman; or gently rub the surface over lightly with an ink-eraser.

JAS. BLISSETT asks: "If a plate of ground glass be coated with a solution consisting of sodium silicate, table beer, and minute quantities of other substances highly soluble in water, and allowed to dry, and afterwards well washed under the tap, will not this washing carry away the film of silicate, beer, &c.? My idea is that it will, and that the plate should not be washed."—If the film is properly prepared, it will not all be washed off. This was a very general way of forming the substratum on collotype plates, and is still used by many. It is necessary that the plate be washed if it is to be used for collotype.

M. A. G. B. writes:—"We are about to build a studio for process work on a site which is favourable in all respects (including north light) except that we shall have vibration from the room beneath. To counteract this, we propose using a swing base for the cameras, but should be glad of advice from you as to its practical success, and best methods of carrying out this scheme."—The plan will answer well, and is one that is generally adopted where there is a chance of vibration. All that is necessary is to suspend the frame which carries the camera and the copying-board from the roof of the studio, from one point of suspension.

STUDIO writes: "I want to build a studio with a direct south aspect. Is it possible, by any means—diffusing the light with blinds, &c.—to use it for portraiture with success? Shall I be able to get any effect of light and shade? Will it be the same as north light when the sun is not out? I shall be most glad of any advice you can give me on the subject."—The studio will answer quite well, and as good results may be obtained in it as with one with north light. But at times it will be a little more difficult for a novice to work in. We should advise the studio to be glazed with ground glass, and be provided with a set of thin muslin blinds, or screens, in addition to dark blinds.

HANLEY (Staffs).—"Will you kindly tell me if the negative belongs to the sitter or photographer in case no previous arrangement has been made, and also if there was not a case a year or two ago about the above between a clergyman and a photographer, in which it was decided that the negative was the property of the person ordering the photographs?"—The negative decidedly belongs to the photographer. The sitter only pays for portraits, and is no more entitled to the negative than he would be to the lasts upon which his boots are made. If a separate charge were made for the lasts then he would, of course, be entitled to them. If a definite charge were made for taking the negative, the case would be similar. That was so, we believe, in the case referred to.

A. H. C. writes: "1. I have some plain collodion which I desire to use for dry collodion transparencies. How am I to arrive at the amount of $ZnBr_2$, HCl and $AgNO_3$ required according to formula on p. 882 of ALMANAC? The collodion holds as much pyroxyline as it will dissolve. 2. I have some pyroxyline that was bought more than a year ago. It has now a strong smell of nitric acid, and rapidly changes ordinary white paper yellow if wrapped in it. It partly dissolves in ether and alcohol, leaving a flocculent residue. Has it become worthless, or will a washing in water put it right?"—1. "The collodion holds as much pyroxyline as it will dissolve" is far too indefinite to advise upon. Better prepare fresh collodion according to the formula given. 2. The pyroxyline is useless, and the sooner it is destroyed the better.

ACROSTIC.—C. V. Grinfield, Weston-super-Mare, sends the following acrostic on the word "photographs":—

"P icture in little"—miracle of art!
H eav'n's pure reflection of man's face and mien!
O f friends, of kindred, those we most admire,
T he miniature presentment to the life!
O h, could we look on the immortal dead—
G iants of olden days, or chief on Him,
R ising pre-eminent, the Son of God!
A s pictured thus so exquisitely true,
P ortraits like these, such perfect photograms,
H ow kindly sent by Heav'n to rich and poor,
S olace the heart with beams of light and love!

H. & S. ask us to help them out of a great difficulty they have experienced with their toning for some weeks past. "Every care has been taken with regard to cleanliness of dishes, measures, &c., the toning bath made three days before use, and tried both warm and cold, being made with distilled water, the formula as No. 1, page 892, of your ALMANAC for 1894. After washing prints and immersing them in toning bath, they become of a brick red (and in most cases exceedingly mealy), from which we have been unable to free them after having remained in the bath for an hour and a half to two hours, starting the proportions at one grain to the sheet, and keep adding up to eight grains to the sheet, the prints give up considerably, being very light when fixed. Thinking you may, perhaps, be able to give advice as to quality of gold, we forward you a tube from box from which we have been using, together with a toned print, one of the best we have obtained for two or three weeks."—If the bath was prepared according to the formula, and every care taken as described, it should work perfectly satisfactory. If fresh gold is added while the prints are toning, mealiness is almost sure to occur, and it is of no use to continue toning after that begins. It is quite possible that the paper itself is at fault, or the bath upon which it was sensitised was out of order. Try a different brand of paper and sensitise it on a new solution of silver.

C. H. YOUNG writes: "I shall be greatly obliged if you will kindly give me a little information about copyright law. I have written to the Secretary of the Union, but have had no reply. 1. Not long ago a well-known authoress gave me a sitting, and is so pleased that an order has been placed in my hands, but no money paid as yet. Cannot I copyright the picture, as it will be in great demand? 2. Again, I was requested to make a picture of one of the principal characters in Welsh history, and, in order to do this, I was able to borrow an original *carte* of the subject, only one or two of which are in existence, and are certainly not copyright. It was in a dreadful condition, and barely recognisable. From it I made an opal enlargement, and the result is a very first-rate and true picture, which I can copy as a cabinet, or *carte*, or lantern slide, and which I know *is* to be copied by another photographer for the lantern. Surely my skill and labour and ability of securing the original *carte* are not to be lost? The phrase that puzzles me is, 'for valuable consideration.'"—In reply: 1. So far as we can see, the copyright is yours; but, if the portrait were taken in the ordinary course of business, you have no right to make any use of it except to the order of the sitter. 2. The same answer applies to this case. If you were paid for making the enlargement, you have received a "valuable consideration" for the work you have done.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1766. Vol. XLI.—MARCH 9, 1894.

HYPO.

The quality of thiosulphate of soda—the familiar "hypo"—is a matter deserving far more consideration than is usually given to it. A pure quality is essential as regards any just expectation of permanency in silver prints, and is an important factor in judging of the real economy of a particular sample when comparing its price with another. We are led to discuss this matter through having had placed in our hands a circular respecting a particular make of hypo, and commenting upon the salt to be had in various quarters. While in no way either endorsing what must necessarily be considered an *ex-parte* statement, we feel it worth while giving an almost verbatim extract from this circular as calling attention to what is a kind of confirmation of the view long held by us. Along with a chemical certificate of the particular sample in question (all allusion to the source of which is, for obvious reasons, withheld) we read as follows :—

"Foreign hypo-soda is almost always supplied in dull and lumpy crystals, larger and apparently drier than the pure, clear, colourless crystals of our agency. This very fact is proof of an excess of impurities (sodium chloride and sodium sulphate) in all such dull and lumpy crystals, as these impurities cause the crystals to differ in shape and appearance from the crystals of a pure or almost pure hypo-soda. It seems but fair and just to buyers and consumers, as well as to our principals, to point this out, since foreign hypo-soda is often thought superior, owing to the crystals being larger and apparently drier, &c., which is a defect, and proof of inferior quality.

"In support of this statement we may say that samples of so-called best foreign hypo-soda were found to contain about one-half per cent. sodium chloride and one-and-a-half per cent. and more sodium sulphate."

We have at once to say that, with regard to some particular samples of hypo which have come under our notice, the above remarks are mild in the extreme compared with what could be said, and justly said. It is sufficiently objectionable to have sulphate of soda present in the form of what might be termed a casual impurity; but, in the samples we speak of, brought from two entirely distinct sources—one an English and the other a foreign agency—the amount present was so great as to constitute a distinct sophistication. Sulphate of soda can be bought at from one-half to one-third the price of hypo; hence, if a so-called hypo contains twenty or thirty per cent. of this adulteration, it needs no soothsayer to point out how easily it could compete in price with genuine crystals. This has been before alluded to, as also the manufacturer's reply to complaints. He gave an extract from Watt's *Dictionary of Chemistry*, which gives a colourable excuse for his really bad wares. He stated that the sample was pure when sent out, but had become oxidised to sulphate by the action of the air, and the authority said, speaking of hypo, "the aqueous solution cannot be preserved unaltered even in closed vessels, but deposits sulphur, and is partly converted into sulphate of sodium; in contact with the air, it is gradually but completely oxidised into sulphate." The maker chose to read this slightly ambiguous paragraph as stating that it was the crystals that so oxidised, while, as a matter of fact, the solution only was inferred. Lest some one should object to this reading, the following extract from the recently published third volume of the *Dictionary of Applied Chemistry*, by Dr. T. E. Thorpe, Professor of Chemistry in the Royal College of Science, London, will at once indicate the true rendering. On page 447 it is stated, "The salt forms large transparent prisms, belonging to the monoclinic system. Its solution is neutral to test paper; it is without smell, has a cooling taste, and does not change on exposure to air." It would be difficult to find a more positive statement than this. The question, then, of the presence of sulphate of soda as an adulterant or an impurity is the most pressing of all in considering the quality of any sample. Fortunately the presence of any large proportion may be readily found without analysing a suspected sample simply by placing a small quantity on a mantelshelf, or other warm place, and leaving it exposed to the air for a week or two. The presence of the sophisticating salt will be at once shown by an increased dryness, and often by a distinct opaque whiteness in places where, by dissipation of a portion of the water of crystallisation, the sulphate has effloresced and become white. Should any one desire to ascertain with exactitude whether any sample is pure, it can easily be done by a solution of pure dry iodine; 24·8 grains of clean dry hypo ought to be entirely decomposed by 12·7 grains of iodine; any defect in the quantity of the latter required to effect complete decolourisation of its solution indicates the proportion of impurity present.

The remarks quoted from the circular as to the appearance of the crystals are quite just also.

With regard to solution of hypo, readers will do well to bear in mind the remarks in Watt's *Dictionary* as above, for there is a growing tendency to store this salt in solution in tanks; indeed, in some large establishments it is "laid on" like water from the main. It is decidedly advisable therefore, especially when it is used for paper prints, to so treat it as to prevent decomposition. This can be done by an addition of carbonate of ammonia ("sesquicarbonate"), on the authority of Mohr; while Messrs. Harcourt & Esson, in *Philosophical Transactions*, state that a little caustic soda greatly increases the stability of the solution; but, on all accounts, the ammonia method

should be preferred. Mr. Spiller long ago proved that the addition of this salt to the fixing bath for albumenised paper prints was efficient in dissolving a trace of silver always left after thorough fixation with "hypo."

It may be hoped that, after attention has been thus pointedly drawn to the adulterated hypo which has been on the market, in the near future it may no longer be offered for sale.

THE WET-COLLODION PROCESS.

XIII.—Moist Processes.

Up till now our description of the wet-collodion process has assumed the utilisation of the plate immediately after it has been rendered sensitive, and that no time is allowed to intervene between its having been taken from the silver bath and its exposure in the camera, or between this latter and the application of the developer.

For the first two or three years after the introduction of the process, several ingenious means and appliances were adopted by which it could be practised when away from home, these including tents of various kinds, series of baths affixed to the camera, and like expedients; but a growing desire was experienced for the adoption of some means by which the sensitised plate might be retained in a moist condition for a period more or less prolonged. The professional portraitist also desired easy means by which his spare time in the morning could be devoted to the preparation of sensitised plates, which should be ready for exposure immediately a sitter was ushered into the studio to sit for his portrait.

This latter desideratum, we may here observe, was latterly attained by the agency of a grooved water-tight plate box, filled with distilled water, in which the plates were stored after being sensitised, and where they could remain all day long ready for use, an immersion in the silver bath for two or three seconds previous to development ensuring results similar to what would have been obtained if all the operations had been performed at the time. Unless we are much mistaken, this method of preserving plates was for a considerable period maintained as a secret, and sold as such to several professionals.

The earliest suggestion as to the preservation of plates in a moist state came from Messrs. Spiller & Crookes, both of them at that time, as at present, accomplished chemists in selecting and trying the impregnation of the collodion film with salts having a strong affinity for water, and at the same time incapable of forming insoluble compounds with silver, after trying the nitrates of lime, magnesia, and zinc, the last was at first preferred. After sensitising as usual, the plate was transferred to a bath of fused nitrate of zinc, two ounces of which were dissolved in six ounces of water. Acetate of potash was afterwards found to give more advantageous results, and still more subsequently a solution of nitrate of magnesia, with a little acetic acid, was found to enable plates to be kept unimpaired for three weeks.

As an example of how experiments often run in parallel directions, Mr. Shadbolt almost simultaneously published his honey process, which was for a long time a deservedly favourite one for keeping plates a considerable time after preparation. Having still a vivid recollection of the pleasure we experienced in working it, and of the many good negatives we obtained through its agency, we append a brief account of it.

After the collodion film has been excited in the usual manner, on taking it from the bath, it is drained as thoroughly as possible, and a little of a preservative syrup, prepared as follows, poured over the surface:—Dissolve 5 parts of pure honey in 5 parts of distilled water, and stir with a glass rod until the honey is quite dissolved, afterwards filtering the mixture, to which 1 part of alcohol is then added. As it was important that the silver left on the film should be reduced to a minimum without being entirely eliminated, the expedient was adopted, soon after the publication of the process, of transferring the plate, after sensitising, to a bath of distilled water containing a trace of silver only, in which it was washed.

The honey mixture is poured on and off, care being taken to allow it to penetrate every part of the film. The plate is then reared up on a sheet of blotting-paper, face to the wall, and time allowed for the paper to absorb the drainings, after which it may be placed either in the dark slide of the camera or in a plate box. The plates are not so sensitive as when used wet, but they keep well for a few weeks.

Previous to developing, the plates must have all the saccharine solution washed off by placing them in a flat dish with water, which must be allowed to flow backwards and forwards over them, and silver must be added to the pyrogallic developer; this latter must be done sparingly, to prevent the negative from becoming too dense.

Glycerine in various ways has been tried with more or less success in keeping plates moist for a few days or weeks. What we believe to be the best way of employing it is a method introduced several years since, by which a solution of nitrate of silver was mixed with glycerine and the bottle containing it then exposed to the sun for a few hours. A good formula for its preparation consists in mixing together equal parts of pure glycerine, distilled water, and of a thirty grain silver solution. Probably a little discolouration will take place by a prolonged exposure to light, but it can be rendered quite clear by shaking it up with a little kaolin, which may be allowed to remain at the bottom of the bottle in which it is contained, decanting off the clear solution as it is required.

This is poured over the plate after its removal from the silver bath and allowed to soak well in. The plate is then allowed to drain well, as in the before-mentioned honey process, after which it is put away for use. Either an iron or a pyro developer may be used.

For photo-lithographers or others whose business has much to do in the copying of maps or line engravings, either the honey or the glycerine process should prove invaluable because of the great intensity that can be obtained. The black lines will be perfectly clear glass, while the white paper will be absolutely opaque. The most intense negative of this class of subject that we have ever seen was obtained by coating a sensitised plate with a mixture of honey, glycerine, and silver solution, and developing with pyrogallic acid. No intensification of any kind was had recourse to; but, on the application of the developer, the image grew in density until it was absolutely opaque, the lines all the while remaining clear and bright.

TEMPERATURE AND DEVELOPMENT.

Although during the winter months the question of the temperature of the developing room is frequently presented to us in an inconvenient manner, it is doubtful whether any attention can be said to be given to the subject beyond the mere warming of the atmosphere to render the apartment habitable. Yet, if carefully studied, it will probably be found

that the temperature of the developing solutions themselves may have quite as important an influence upon the ultimate action as very considerable variations in the nature and proportions of the ingredients themselves.

This is more especially the case at the present day, when we find ourselves with such a wide and varied choice of developers, all of which differ more or less in their general behaviour under change of temperature. Under such circumstances, the operator who confines himself to only one developer may not perhaps experience any great amount of inconvenience, but it will undoubtedly be found to lead to serious irregularities in those establishments where different makes of plates as well as different developing solutions are in constant use.

Some years ago we gave an account in these columns of a series of experiments in connexion with variations of temperature of the developer then in use, pyro having at that time practically the monopoly of favour, and mostly in conjunction with ammonia, although the fixed alkalies were finding their way into use. The experiments we refer to were chiefly confined, if we remember rightly, to the pyro-ammonia developer, which was then the standard, although there is little reason to suppose that the general results would vary very greatly when the alkaline carbonates are substituted for caustic ammonia. Only one point need be taken into consideration, namely, the volatility of ammonia; and, when due allowance is made for any possible effect that alteration of temperature may have on the alkalinity of the solution, we think little difference would be found between the results obtained with different agents in conjunction with pyro.

But it is altogether different when we begin to consider pyro as compared with the other newer reducing agents. We need go no further than hydroquinone in order to show how widely different is the behaviour of its solution from that of pyro and ammonia under comparatively insignificant variations of temperature. For instance, at the normal temperature, hydroquinone is, under the most favourable conditions, slower in its action than pyro, although, when combined with caustic soda or potash, the difference is, perhaps, not very marked. With a slight fall of temperature, however, the difference in mere speed of action becomes more strongly emphasised, for, while the pyro loses, as might be expected, some of its original speed, hydroquinone has its action almost completely arrested, and, in fact, becomes, at a temperature at all approaching freezing, practicably unusable.

If such be the case with the two developers named, it is only reasonable to anticipate corresponding variations in the case of others, and actual trials have proved such to be the result, although the experiments hitherto made are not of a sufficiently exhaustive nature to enable us to give more than a general idea of the behaviour of the different developers at the extremes of temperature.

In our experiments with pyro years back, the general effect of reduced temperature was, in addition to retarded action, a tendency to greater clearness or loss of detail in the shadows, or, in other words, a result was produced corresponding with that brought about by the use of restraining bromide. On the other hand, with a higher temperature, came a precisely opposite result, namely, loss of density and tendency to fog, together with the general symptoms of increased exposure. Practically, however, it was found that the raised temperature was of little actual value in curtailing exposure, or in getting any more out of an under-exposed film than was possible at the normal; on the contrary, if anything, the better result was gained with the solution at a lower temperature and prolonged action.

With hydroquinone, as already remarked, developing action almost ceases with a reduction of temperature, or at least is so excessively retarded as to almost render the solution useless; but under opposite conditions, namely, a rise in temperature, a remarkable acceleration of the action ensues; indeed, a very few degrees above the normal will suffice to convert hydroquinone from a decidedly slow to a really rapid developer; and, what is of greater importance still, the accelerated action is not accompanied, as in the case of pyro, by either loss of density or tendency to fog, unless the increase of temperature is sufficiently great to cause danger in other directions. Indeed, as regards the matter of density, a better general result is, we think, gained, especially in the half-tones, with the higher temperature solution than with the normal, and it is indubitable that under these circumstances the available sensitiveness is increased. It is this difference in the relative action of the different developers that is likely to cause uncertainty, although, as already suggested, the operator who confines himself to one solution is not likely to experience much trouble.

Passing on to the other new forms of developer, we have experimented with eikonogen, amidol, and metol, the second and third of which, under a serious fall of temperature, precipitate a portion of the active agent, owing to its low degree of solubility. Eikonogen, otherwise, under the influence of a few degrees of lower temperature—say, from the normal to 50°—does not vary very greatly in its action; that is to say, it does not lose its rapidity of action to the same extent as pyro, but at a higher temperature it becomes unmanageable; at 70°, for instance, the result is equivalent to hopeless over-exposure. Metol behaves in a somewhat similar manner, though it is more under control than eikonogen, especially when checked by means of bromide freely used; but there is practically nothing gained in this manner, unless it may be a slight increase of density, for any advantage accruing from the higher temperature is counterbalanced by the restrainer.

Amidol behaves in much the same manner as metol generally, but when used at an increased temperature, and with a full dose of bromide, is capable of a great deal more density than can be obtained under normal conditions. In fact, at this season of the year there seems a decided advantage in a rise of temperature when using amidol, though it is scarcely to be said of any of the other developers. In the same manner, it may be expected that amidol will behave more satisfactorily under normal summer conditions than is found to be the case in winter.

By calling attention to these irregularities in the behaviour of the different developers, it is possible that we may save trouble to some of our readers, while others, now that attention is directed to the matter, may be induced to experiment further in this direction.

Silver still Cheaper.—Since our last issue there has been a further depreciation in the value of silver, and it has once more "broken the record," being quoted at the extraordinarily low price of 2*s.* 3*d.* (27*d.*) per ounce. Notwithstanding this unprecedented price, the market is reported to have been by no means a good one.

Mr. Davison and the Camera Club.—We understand that Mr. George Davison, who for several years past has been Honorary

Secretary of the Camera Club, has resigned that position, his official duties demanding his undivided attention. The exceptionally able manner in which Mr. Davison has always carried on the work of his onerous and trying post will make it a difficult matter to find a suitable successor to him, for it is perhaps no exaggeration to say that to his individual efforts the Camera Club chiefly owes whatever measure of success it has so far enjoyed. We also learn that Mr. Maskell recently resigned membership of the Club, which, from these and other symptoms, would appear to be entering upon a new phase of its career.

Royalty and Photography.—The photographic art has always found favour with Royalty in this country, even from its earliest days, and it is generally understood that several of our Princes and Princesses are tolerably proficient in photography. So, also, are some members of foreign Courts. We learn that the Empress Frederick has induced the two Berlin amateur Photographic Societies to co-operate in bringing about an international Exhibition of photographs by amateurs to be held next year. Her Majesty has also consented to act as patroness, as well as desired the Princess Henry to officiate as her substitute on the Committee. Under such favourable auspices as this, the Berlin amateurs should not fail in obtaining a large and representative exhibition of pictures from all countries. There is very little doubt that Great Britain will be well represented on the occasion, for in no other country are there so many amateur photographers to be found.

Portraits of Statesmen.—"'Tis an ill wind that blows nobody good" says an old aphorism. The present ministerial crisis, we are informed, has already created a fresh demand for the portraits of several prominent statesmen. A general election, which many politicians appear to consider imminent, is thought to bring about a general stagnation of business. Not so, however, with photographers, if one may judge by the use made of the art at the last two or three general elections. That will probably be increased very materially at the next election, whenever that may occur. Those taking an interest in politics are always pleased to obtain portraits of the prominent men of the time of their party, which they readily purchase. Electors, too, are also glad to have the portraits of those for whom they are going to vote, while the candidates themselves are pleased to supply them. Therefore, just now, there is a probable fillip to business in portrait photography. Provincial photographers especially will do well to consider this subject forthwith, and obtain sittings from those who are likely to become candidates for the Parliamentary representation of their districts. As a rule, in a time like the present, they are readily given, whereas at others they are not so easily obtained.

The Late Chicago Show.—The "World's Fair," with its not altogether enviable notoriety, seems to die hard. What with its mishaps prior to its opening, and its incompleteness at the time of that event, the medal episode, the alleged jobbery throughout, particularly with regard to the right of photographing within the Exhibition, and, lastly, the number of fires, especially after its close, in which many foreign exhibits suffered badly, to say nothing of financial matters, the whole thing cannot be considered to have turned out very satisfactorily. Now, a comparison has just been published between the number of visitors attending this Exhibition and the previous one held in Paris in 1889. From this, if authentic—and we have no reason to doubt it—it appears that the largest number of visitors in a single day at Chicago was 716,881, while at Paris it was but 446,178. But the total number of visitors to the Paris Exhibition was much greater than to the American one—about 5,000,000 more—and that notwithstanding that the latter was open for 183 days, while the Paris Show was open for only 164 days. Americans do not attempt to deny that their World's Fair did not prove the greatest event during the last few years. However, our American cousins are an enterprising people, and they will, doubtless, profit by their past experience in their next World's Fair, should they ever attempt one.

Is a Photographer's Show-case a Building?—At the North London Police Court on Monday, March 5, William Wright, photographer, of Mare-street, Hackney, was summoned by the London County Council for erecting a structure contrary to 45 Vic., cap. 14, sec. 3, of the Metropolitan Building Act. Mr. Chilvers appeared for the County Council, and Mr. C. N. Young defended. Mr. Dovaston, surveyor, said the defendant had erected a kind of show shop in the forecourt of his private house, this being a basement of wood standing upon a concrete floor. Above the wooden base were glazed sashes and a cornice over, and on the top zinc. The sides and back were of wood, and there was a door at the back large enough to admit a man. Mr. Young: A man could not live there? The witness: No. Mr. Young asked the grounds of objection to what he called a photographer's show-case. Mr. Chilvers: It is unsightly, a public danger, and beyond the line of public buildings. Mr. Young: I do not admit this. It certainly is not unsightly, for it contains the portraits of the prettiest women and the handsomest men of Hackney. It is not a public danger, because it stands upon concrete, is covered with zinc, and is twelve feet from the dwelling-house. There is also the right of user. Mr. Wright bought the business of another man, who had a show-case in the same spot. Mr. Lane said he would take time to consider the cases on the subject, and the matter was thereupon adjourned for three weeks.

Dark-room Light.—The meteorological report for February shows that, although the sun was above the horizon for 278 hours, it only shone for 62 hours, so that but 22 per cent. of the possible sunshine was experienced. However, although "old Sol" showed his face so little, there has been a marked increase in the actinic quality of the light of late, and this should be taken into account by those who employ natural light in their dark rooms, particularly when coloured fabrics are used on the window. Some of these are liable to change in colour by a prolonged exposure to light, although they may not be suspected of doing so, even by experienced photographers. Here is a case in point that was brought under our notice a few days ago. A professional photographer last year fitted up a new dark room with a window about twenty inches by fifteen, facing north, which was covered with two thicknesses of a non-actinic medium. The light proved perfectly safe with plates of all rapidities. Recently, however, occasional trouble appeared in the shape of fog, and two brands of rapid plates were returned to the makers as being faulty, and, after an angry correspondence, the window was examined. It was then found that the outer thickness of the coloured medium had become much bleached—hence the cause of the trouble. The light was perfectly safe for the manipulation of plates of ordinary sensitiveness, but failed entirely when those of extra rapidity were employed. As this occurred in the establishment of a professional photographer of long standing, we call attention to the subject once more. Nearly every spring this matter comes forward in one form or another.

Photographing the Spectrum of Lightning.—An ingenious method of photographing the spectrum of lightning is proposed in the current number of *Wiedmann's Annalen* by G. Meyer. The difficulty of directing the slit of the spectroscope upon the flash is got over by substituting a diffraction grating for the prism. A grating ruled on glass is placed in front of the object-glass of the apparatus, the object-glass being focussed for infinite distances. Under these circumstances several images of the flash are obtained, a central image produced by the undiffracted rays, the images of the first and higher orders belonging to the diffraction spectra. The number of images of each order corresponds to the number of lines in the spectrum of the lightning. The arrangement was tested during a night thunderstorm. Two plates were exposed in a camera with a landscape lens of 10 cm. focal length, provided with a grating with forty lines to the mm. One of the plates showed two flashes with their diffraction images of the first order, but representing one line only. The other showed a number of flashes, and one very strong one, passing apparently between two chimney-pots, with its diffraction images well marked. A calculation of the wave-length

of the light producing these images gave 382 $\mu\mu$. The measurement was not sufficiently accurate to warrant an identification of this line with a known wave-length, but it is certain that a radiation of about this wave-length must be added to the lines determined by Schuster and Vogel. It is probable that with better apparatus the method may be made to considerably increase our knowledge of the ultra-violet spectrum of lightning.

PORTRAIT BACKGROUNDS.

In these days, when complaints of business falling off reaches us from all quarters, any plan, old-fashioned or modern, that will have a contrary tendency should be acceptable. That the background of the portrait plays a most important part in the artistic effect of the picture is undisputable. Sir Joshua Reynolds considered little less skill was required to paint a good background than the portrait itself. Do photographers attach the same value to them? I am afraid not. A background so long as it is free from technical defects and not obtrusive will generally pass muster. The great difficulty—expense and storage—of adding *artistic* backgrounds with *sufficient variety* induced the use of plain ones, which, *if devoid of gradation*, was little else than adopting another objectionable extreme, producing in the portrait a sort of inlaid effect. Shaded or clouded backgrounds were a great improvement, and will for vignettes, no doubt, continue to be popular; but with solid pictures, or those not vignetted, there seems to me to be a grand possibility generally wasted, a space that, if judiciously filled, would add immense interest to the picture without in any way detracting from the importance of the portrait. To compare one class of picture with another, what a wonderful increase of interest there is in a landscape that has introduced the tiniest peep of a good distance when the principal part of the subject is foreground and near mid-distance, or, in an interior, when the view outside is seen through doors or windows, if it consists of nothing more than a tree or two or a garden path. So with portraits; if the background, instead of remaining an uninteresting space, is *suitably* filled with subject-matter, we render that portrait more pleasant to look upon, in fact give it a vastly increased interest.

More artistic skill is available now than formerly, and there is no reason why backgrounds should not come more under its beneficent influence. Considerably more than a quarter of a century ago Mr. T. Edge, of Preston and Llandudno, set an example of what might be done in this direction, and many pictures emanating from his studio at that time not only bear favourable comparison with the work of the present day, but I very much question if any modern work of an approximate kind is anything like so good, even if any, which I much doubt, is produced at all. Some of the finest he issued were most charming compositions—gems in miniature, perfect in technique, and perfect in conception. Suitable models were selected in their every-day costumes, without any attempt at theatrical effect, and the working classes of the north of England and Wales left little to desire in "make up," provided an intelligent model could be secured. The accessories were ready to hand, and there is no question whatever but they received masterly treatment. Most of the subjects were rustic, lending themselves better to pictorial compositions than other kinds, Mr. Edge's dominant idea being always to produce a *picture*.

Mr. Wharton Simpson exhibited some half-dozen subjects at one of the Society meetings (I believe it was the old South London). These were the first I had seen; their method of production was then much discussed. No one present had previously seen anything like them, and the impression they made on me at any rate was most certainly lasting. These pictures had all the appearance of being taken on the spot represented; no lines of light or overlapping dark ones round the figures, which, with the background, were in perfect keeping, the light feathery grass in perfect relief against the darker landscape behind; in fact, none of the darker shades of the background encroached the least on the light portion of the foreground and figure. The method of doing it was not communicated, and it was not until some years afterwards I had the opportunity of seeing them actually produced.

A considerable business at high prices was done by adopting this method with persons in ordinary dress, but it need not be said that, from a purely pictorial standpoint, they did not equal those specially made without regard to the actual portrait of the individual. At the same time, very pretty results were made. Enterprising photographers might find it to their advantage to take it up at the present time, when the whole profession is crying out for something to improve business; but it is one of those things, if not *well* done, had better be left undone, not that there is any particular difficulty about it, but it requires artistic knowledge and delicacy of manipulation in the worker.

It is some years ago since Mr. Edge discontinued making them, increase of business preventing him giving his personal attention to the matter. It seems a pity that the means of producing such beautiful results should be neglected, especially when complaints of the badness of business and lack of novelty are so rife.

In the following article I propose to describe how this class of picture may be made to the best advantage—not for the first time, by the bye, but, as there are so many additions to the army of photographers year by year, an old tale oft told is not without the advantage of novelty to many.

The following conditions are required, primarily: artistic ability, supplemented with suitable background negatives, and fair manipulative skill.

The Background Negatives

may be landscape or interiors, and be thin, quick-printing ones, not including any near foreground, as this portion of the picture is taken *with* the figure. Near middle distance and distance are all that are required for the work. Of course, the subject, *whatever it may be must harmonise with the foreground and figure*. It will be presently seen that the size of the landscape or interior negative is immaterial so long as it is sufficiently large. This remark, of course, applies to the actual size of the plate or film, not to the subject on it. A suitable bit may be selected from a large negative, often with advantage.

The Figure Negative

is taken with a plain, graduated background, the foreground being built up in the studio. In Mr. Edge's practice he had one studio devoted to this work. A solid bank of earth and stones was made some six feet in front of the background, across the studio; plants and grasses were grown in it, and not kept in flower-pots, like the usual studio greenery. By allowing suitable foliage plants to grow *in situ* under natural conditions, a much better effect was obtained; in fact, all the accessories were *solid and real*, and were veritable bits of natural landscape. A portion of the bank represented a pathway, so that the whole of the figure, including the boots, could be shown if desired, or the model, by stepping a little to one side or the other, grass or foliage might obscure the lower portions of it at discretion. The form of the bank facilitated this. Water was contained in a shallow zinc tray, into which pebbles and sand had been introduced, real boulders were used, no *papier-mâché* imitations being tolerated; a few boxes containing grasses, &c., similar to those growing on the bank, and a few stones were all that were required to give variety, as the length of the bank, permitting the figures to move to the right or left, was sufficient to vary the small portion of foreground taken with each figure. Special subjects might occasionally require more alteration, but this was sufficient for ordinary work, and gave a realistic effect that a mere imitation foreground could never do.

A Shaded Plain Background,

fixed a couple of yards behind, and inclined forward at the top, graduated from a deep grey at the bottom to a pearly-grey at the top, the colours used being pure black and white ordinary oil paint in varying proportions. The inclination of the surface avoided reflections, its distance from the subject putting it quite out of focus, with the result of a wonderful atmospheric effect unobtainable with a background fixed upright and nearer the subject. When in printing the landscape was superposed on this gradation tint, it caused the foreground to melt into the distance with the utmost harmony, and in the most natural manner possible; the illusion was perfect. If only clouds were added, the same realism and naturalness was obtained, defying the strictest examination to detect as a made-up picture.

The Illumination

of the subject was identical with that used for ordinary portraiture in the same studio. There was a great flood of light, modified by blue gauze curtains, *chiefly* top and front side light, owing in a great measure to the form of the studio, which was wedge-shaped, the background being at the thick end, and the camera placed in a dark or unglazed portion at the thin edge of the wedge. With the exception of occasionally regulating the curtains at the side, the lighting was right for the greater number of subjects without alteration.

Although these were the wet-collodion days, a good deal of the work was done without head-rests; still they were there, in case of a difficult subject or if the exposure required was more prolonged than usual. A flap shutter, worked behind the lens by a milled

head on the outside of camera, was the kind adopted, three or four seconds the average exposure with grown-up models, no sitters being taken if the exposure was estimated to exceed fifteen seconds, that being the length of time Mr. Edge considered a person could retain a proper, unstrained expression. In those days this was considered a fairly rapid exposure; at the same time, I much question if we get any better results in *general* work with the modern rapid dry plates. I have often thought that the expression is better rendered by a few seconds' time than by the fractional parts of a second; the first stiffness of enforced quietude generally disappears in a second or two. I know the prevailing idea is to get the exposure before the sitter is aware of it. It may be done sometimes, but, as a rule, the intelligent sitter knows all about it perfectly well.

The Negative

being developed and finished, we have a picture with a brilliant foreground, and the figure boldly relieved against a textureless grey background, which, owing to the shading, has a particularly atmospheric effect. A mask has now to be made that will exactly cover the *figure* and *lighter* parts of the foreground wherever it is necessary to retain its purity. Mr. Edge's plan was to lay over the print a piece of plain thin glass, and paint over all those parts on this cover glass that required shading, with black varnish. This, of course, necessitated considerable care, so that there should be no overlapping on the one hand, or underlapping on the other, either of which would be fatal to the effect.

A landscape or interior negative being selected, the print was, in combination with the mask, to which it was attached by gummed paper, placed on the most suitable portion of it, filled in, and put to print at the bottom of a deep box, so that only parallel rays of light could get to it, in order to prevent any shadow being cast by the mask in places where it would prove a defect, by making either a dark or light line round the figures. This plan was afterwards modified by painting on the print itself all those portions to be protected with thick gamboge yellow, which washed off in the washing water without leaving any trace of colour; this simplified matters considerably, as the printing could be done without any extra precautions, and in any light—the chief care was not to print the background too deeply, keeping the whole nicely atmospheric, and somewhat suggestive in effect, the foreground being already provided on the figure negative with proper brilliancy. Interior backgrounds were put in on exactly the same principle, the foregrounds in this case being made in accordance. The portraits were taken in the ordinary studio, with a plain light background.

In the foregoing remarks the process has been described of producing the highest class of work *ab initio*. Sometimes we may have a negative, not taken expressly for the purpose, that we should like to print in a similar manner. The nearest approach to it is, in the first place, to carefully paint out the whole of the existing background, and everything else not required to show in the finished print, with black varnish or Gihon's opaque paint; this leaves the print with a perfectly white background, that, if left, will prevent any good results in the second printing. Therefore, to get an approach to harmony after masking the print, it must be shaded down with a graduated tint deeper towards the lower part before putting it on the landscape or interior to be introduced. The results are, however, much inferior, and are at best a makeshift, although the plan succeeds somewhat better for interiors than landscapes, as such require somewhat rather less delicate treatment. Usually an interior is printed deeper than an open-air view; very much, however, depends on the artistic ability with which the whole thing is managed, a good result fully repaying the extra trouble of preparation.

Edward Dunmore.

AMERICAN NOTES AND NEWS.

Composition in Photography.—Despite the fact that Mr. Archibald Treat, in proposing to contribute a series of articles on photography in our contemporary of the far West (*The Pacific Coast Photographer*), admitted a total ignorance of chemistry, there is no doubt that he writes well and to the point on the subject of making *pictures* by the agency of photography. He gives us the secret of successful composition with the camera, which is to do the composing on the ground glass. "Don't wait," he says, "until after you have finished the print. It has been my experience that post-mortem composition of a negative resulted in its ignominious burial in the waste pile. Successful photography largely, almost entirely, consists in composition. Study well the image on the glass, using for this purpose a very large stop, so that you can see what there is to be seen. In a radius of ten feet you can sometimes make ten different changes in your composition. A bad print can be destroyed and another made, even a bad negative may be doctored, but, if the composition is bad, nothing can or ought to be done." We quite endorse Mr. Treat's sentiments. It might be well if photographic writers would give a little respite to developers and other things appertaining to technics, and give more prominence to composition. *Apropos*, would it not be a valuable kind of education if at some of our now numerous lantern shows some one competent to do so were appointed to give a running comment on the composition of the various pictures projected on the screen?

How to Treat a Customer.—In the *Canadian Photographic Journal* Mr. J. C. Walker considers that many good photographers fail to make a success in business because they do not properly understand the art of treating customers, which requires a great deal of natural intuition, good judgment, and a certain knowledge of character-reading. He believes that, by a little careful study, much can be done in this direction. Starting with the rule to treat every customer alike as regards showing the same courtesy and consideration to all, irrespective of the extent of their order, the manner in which the photographer handles his patron should vary with every customer, according to temperament, which is where the art of handling customers comes in. If he is talkative, talk with him; if familiar, be familiar and make him feel himself at home. Make some feel that you are greatly indebted to them, while, with others, don't allow them to teach you your business, but make them feel that you are master of it. It is the same on this side of the Atlantic as it is in Canada. We know some really good photographers who have not achieved a business success because of their want of tact. The *Suaviter in Modo* and the *Fortiter in Re* must operate side by side, although tact will indicate the propriety of veiling the latter from being obtrusive. And, on the contrary, we are aware of some highly successful businesses which owe their success to the tact of the principals, whose technical knowledge is so limited as to prevent them risking it by even essaying to take part in a conversation in presence of experts.

Show-case Iniquities.—While on the subject of photography as a business, we observe that a genial, practical writer in the *Photo Beacon* finds it necessary to take professional photographers to task for the state in which their show-cases are kept. We, too, have had to direct the attention of our readers to similar blunders on the part of professionals in this country. Our contemporary says that the show-case is the weakest factor in the establishments of almost all the trade photographers. Cases are stuck up on every available spot around the door leading to the gallery and into the passage or half way up the stairs, filled with an incongruous mass of portraits, mostly cabinets, of uninteresting people, posed as if *flung* into the chair, and in all sorts of weather wornness, and, in some cases, arranged at all angles. You may safely take it for granted that nobody ever gives a second look to such an array of specimens; and if they did, and they were all good, the eye is at once surfeited and confused, and turns away without any lasting impression having been conveyed. The remedy suggested is to confine the show-cases to one or two, and to show only a few of the very best pictures the photographer can do, strong in his own individuality, avoiding all fanciful or grotesque arrangements, and having each in a suitable frame. Half a dozen pictures thus presented would tell better and bring more customers than half a hundred, and would prove less costly and troublesome to change, which ought to be done not seldomer than once a week.

The "Times" in Miniature.—The "Story of the *Photographic Times*," which appeared in the Christmas number of our contemporary, has been issued in the guise of what appears to be a miniature edition of that journal. The colour of cover, the red and black ink appearing thereon, the typography—everything is in fac-

simile. It has, of course, been reduced by photography, and a typographic printing surface thus obtained. The original and the reduction, when seen side by side, strongly suggest the mother and the child. It shows enterprise.

What to give as Prizes.—The *Beacon*, after due consideration, has owned to being bitten by the prize-giving mania prevailing in the United States of America, as in some other places. It has determined upon making its prizes assume the form of goods or articles which will be useful to the (amateur) photographer, such as films, lantern-slide plates, printing paper, or other special and useful articles which it feels that the competitor would like to have in his outfit, but not feeling justified in buying contents himself with makeshifts. We commend this as a good example for others to follow.

THE BEGINNINGS OF PICTORIAL PHOTOGRAPHY.

[Central Photographic Club.]

Chemists writing the history of photography usually award the honour of its beginnings to chemistry. They tell us how the alchemists of the sixteenth century laid its foundation-stone when they discovered that fused chloride of silver blackened in sunlight; that the noble edifice was reared on it by the chemical experiments and discoveries of Petit, Ritter, Wollaston, Wedgewood, James Watt, Sir Humphrey Davy, Sir John Herschel, and other great scientific men who preceded, and more immediately succeeded them, and so on. They rear a mountain of eminent workers, but it was a mountain which produced, after nearly two centuries of labour, what was, pictorially regarded, a very small mouse!

M. Charles, the inventor of hydrogen gas balloons, in or near the year 1780, attracted crowded audiences of curious and scientific Parisians to a series of lectures on natural science. In one of these he worked the feelings of his listeners up to fever heat by darkening the room, admitting sunlight through the hole in a window shutter fitted with a lens, and, throwing upon a sheet of paper sensitive to the chemical action of light the shadow of somebody's profile, showing all his wondering listeners that he could thus produce on a background a silhouette portrait, which upon exposure to daylight faded away. The news spread like wildfire, and soon half the great chemists in Europe and more of the smaller ones were repeating his experiment.

It was true enough, but there was nothing new in it. It opened no fresh aperture for extended investigation, and the prophets who with scissors and black paper were producing with greater speed, certainty, and ease, silhouette portraits that would never fade, laughed it to scorn.

Amongst the listeners to this learned professor was M. Daguerre, a famous and extremely popular young French landscape painter. He had long been using the camera obscura, for he believed, with Leonardo da Vinci, that the images of nature reflected in a looking-glass were just what paintings ought to be. "The dark room," writes one of his biographers, "gave him lifelike representations of nature, in which forms, colours, perspective, and light and shade were all perfectly realistic. Daily contemplating such images often prompted him to exclaim, 'Why cannot I retain these sun-drawn pictures, and fix them for ever on my canvas?'"

But the French professor's wonderful triumph created followers in all parts of Europe. The experiment seemed so simple, the result so wonderful. Everywhere these fugitive silhouettes were described as "pictures!" In a paper written by the combined pens of Wedgwood and Sir Humphrey Davy, referring to these ignoble though sun-made works of art, we read, "All that is wanted is a means to prevent the lights of the picture from being afterwards coloured by daylight." "*All that is wanted!*" The ambition of the artist Daguerre would not be so satisfied, his imagination soared far, far above "pictures" of profile shades.

When opticians write their histories of photography we recognise the same tendency to claim its conception and development as due to optical science. The art began, we are told, in the sixteenth century with the invention of a camera obscura. We learn from them all about refraction, reflection, and aberration, angles of aperture, achromatic and non-achromatic results, of luminous and actinic images, &c. We see them struggling to increase the brilliancy of the reflected image, to enlarge its field, to avoid distortion of forms, and ensure in every part of the picture microscopical sharpness. Their idea of a perfect photograph was one that could be subjected to a very high magnifying power, and yet be in even the smallest detail comparatively sharp. Without a magnifying-glass no collection of photographs could in their estimation be properly appreciated. They first set up that false idol for worship against which I struck my hardest in the photographic journals of long ago, the idol called sharpness. In Dr. Halleur's "Art of Photography" (of which an English translation appeared in 1854) we are told that a photographic lens was perfect when it gave "equal clearness and distinctness in all its parts, even to the border and equally so for near objects and for those farther off." It was no such reflected images that Leonardo da Vinci so enthusiastically held up to painters as representing perfectly the effect of air and space, depth, and the truthfully varied aspects of retiring surfaces. It was not such images that Daguerre sought to perpetuate, for his landscape paintings were famous for the truthfulness of their aerial perspective. Leonardo, in his *Treatise on Painting*, writes: "When you give strength and precision to objects seen at a distance, they will appear as if they were very near. Endeavour that your imitation be such as to give a just idea of distance. If the object in nature appear confused in the outlines, let the same be observed in your picture. The outlines of distant objects appear undetermined and confused for two reasons: The first is that they come to the eye by so small an angle, and are therefore so much diminished; the second is that between the eye and the distant objects there is so much air interposed that it becomes thick and like a veil," &c.

In pointing these things out I trust I shall not be misrepresented. I do not ignore debts fairly due. No photographer should regard the early experiments of our chemists and opticians with any feelings but those of respect and gratitude. I am only anxious to show that side by side with them artists were working from the very first, and claim for my brethren of the brush and palette their fair share of honour and glory. They originated "Pictorial Photography."

The first conception of what may fairly be called pictorial photography arose in the mind of a Neapolitan named Joannes Baptista Porta. He was but a boy of fifteen in 1576 (according to some authorities) when he published his *Magia Naturalis*. His contemporaries regarded him as a prodigy of learning, and he was the founder of a society, composed largely of artists, which he called "An Academy of Secrets." Every member of this Society was bound to make known some secret to his fellow-members, Now, one of the most popular books amongst the painters of Italy then was that *Treatise* by Leonardo da Vinci, of which I have spoken already. Leonardo, as you may remember, was a wonderful genius. He excelled most of his rivals as poet, painter, sculptor, engraver, and musician; he was the architect of some famous buildings, a learned optician, anatomist, naturalist, botanist, and engineer, who over and over again advises painters to consult the reflections of nature in a looking-glass in words that show clearly what a deep thinker and close observer he must have been. The readers of such a work would assuredly hail with delight Porta's discovery of the camera obscura, as we are told they did. They were previously indebted to this youth for the inventing of some valuable pigments, and this discovery increased his popularity amongst them.

About this same time a teacher of mathematics named Maurolycus, a native of Messina, published a work called *De Lumine et Umbra*. In this it was shown how mistaken the opticians of that time were in supposing that the human eye did not reflect and disperse, but collect and refract or focus rays of light, a fact which the camera practically illustrated. When Porta assembled his friends in a darkened room and reflected images through a convex lens in a hole in the window shutter, just as Professor Charles did so long after, he set them all wondering at the beauty and perfection of his sun pictures, as Charles set the Parisians wondering at his light-drawn and light-effaced silhouettes. Porta increased the delight of his friends by reflecting the reversed image into a looking-glass to increase its perfection. It cannot be said that this talented youth invented what we call photography, but these artists were as enthusiastic as himself, and Naples was probably as much excited over his genuine and beautiful pictures as the scientific men of Paris were over the profile shadows.

And then the deed was done, the ball was set rolling. Porta's discovery made a noise in the world, and hundreds then cried, as afterwards Daguerre did, "Oh that these beautiful images, so perfect in their resemblances to nature, could be made permanently visible." The desire took wings. Its flight was near and far, the idea lived in the minds of successive generations, the desire was echoed and re-echoed throughout Europe. Antonio Canelletti produced those wonderful and curiously photographic-looking paintings of ancient cities with the aid of Porta's camera. Archbishop Fénelon, so famous and poetic a writer in the days of Louis XIV., describing what he called "The Isle of Wonders," says, "There was no painter in the whole country; but when the people desired to have a friend's portrait, a delightful landscape, or pictures of other objects, they filled with water a bowl of gold or silver. This water acted as a looking-glass, and was so congealed that it retained permanently the impressions it received, producing a picture as faithful as if it had been seen in a beautifully polished mirror." In Normandy, too, we see this germ idea still active in the mind of one Tiphaine de la Roche, who in his favourite fantastic way tells how the genii make their pictures. One of them said to him, "You know that rays of light reflected from different bodies form pictures, paint all the images they reflect on polished bodies, as, for example, on the retina of the eye, on water, and in glass. The spirits have sought to fix these fleeting images. They have made a subtle matter by means of which a picture is formed in the twinkling of an eye. They coat a piece of canvas with the matter, and place it in front of the object to be taken. The first effect of this cloth is similar to that of the mirror, but by means of its viscous nature retains a facsimile of the image. The mirror represents images faithfully, but retains none. Our canvas reflects them no less faithfully, but retains them all. The impression of the image is instantaneous. The canvas is removed and deposited in a dark place. An hour after, the impression is dry, and you

have a picture the more precious because no art work can equal its truthfulness."

The present century found numerous experimentalists at work to realise these dreams. Their rivalry was like that of men in a race, many with the goal in sight, and each one desperately intent upon reaching it first. The French optician, Chevalier, at whose studio Daguerre was constantly to be seen purchasing apparatus and talking about various kinds of lenses, says his shop was much frequented by experimentalists in a heliograpic or photographic direction, "Poor fools and men of science, full of utopian ideas," he would laughingly say, "who want to fix the image of the camera obscura!" Amongst them was Joseph Nicéphore Niépce, whose chief aim was to reproduce engravings, and who, when he received a letter from the artist Daguerre explaining the direction in which he was experimenting and suggesting their working in combination, threw it scornfully aside. What could a painter know about chemistry? It was not until twelve months afterwards, a second letter reaching him from the same source, explaining what Daguerre had already achieved, that he responded to the overture, having previously, however, made cautious inquiries as to the extent of the painter's claim to belief.

About the same time Henry Fox Talbot, when sketching in Italy by the aid of the camera lucida, began his photographic experiments, chemical and optical, with a view not to the demonstration of theories or the showing of curious results, but to the production of pictures. In January, 1839, the Talbotype was announced, and in the following August the Daguerreotype made its bow to the world.

And now I have done with these "beginnings," and need but linger to thank you in anticipation for a patient hearing. The first conception of light-produced pictures was conceived in the brain of a painter, the first successful photographs were produced by painters, and to art, therefore, a due share of the fame which is now almost exclusively awarded to chemists and opticians, and even to the makers of apparatus, should in common fairness be apportioned. In the early days, when I was in the pay of a Daguerreotype operator, and knew all about buffing (oh, that buffing!) and polishing the silvered plate, exposing it to the iodine, and developing it in the mercury box, a very large number of Daguerreotypists were miniature painters, driven in some cases, as I have been, from their painting desks by the popularity of the new art, and bringing to it all their degrees of artistic taste and knowledge of art. I do believe we, too, were useful in giving the art-science artistic value by showing how poor a thing are even the best chemical and optical conditions produced without pictorial effect. The first president of the parent Photographic Society was Sir Charles Eastlake, P.R.A., and one of its two vice-presidents was a famous miniature painter, Sir William Newton. At the inaugural meeting photography was recognised as the result of art and science, and at the first ordinary meeting, held on the 3rd of February, 1853, the first paper for discussion was Sir William Newton's, and the first paragraph of that paper will still do very well for the last of mine:—

"Let us consider what photographs are. The subjects vary with the taste of the operator. Every variety of subject, from the most solid and substantial to the most light and airy, are displayed with that exactitude of delineation which completely sets at nought the exertions of manual ingenuity; still, the general tone of nature has yet to be accomplished by means of photography. Who studies nature sees how beautifully she throws her atmospheric veil, detaching each object, while producing that harmony and union of parts which the most splendid specimens of chemical photography fail to realise. Consequently, *at present*, it is vain to look for that true representation of light and shade in photography which is to be found in a fine work of art. . . . . Let the operator devise or discover the means by which he can produce pictures still more minute and perfect in detail; but he must ever remember, when his subjects are natural objects, that they are powerfully acted upon by atmospheric influences."

If Leonardo da Vinci and Daguerre had been present at that meeting, they would assuredly have cried, as no one did then, "Hear, hear!"

A. H. Wall.

ON THE PHOTOGRAPHY OF THE LUMINOUS RAYS OF THE SHORTEST WAVE-LENGTHS.*

As will be self-evident, all the proofs have only a very relative value. For as the prism and the lenses of the spectroscope employed consist likewise of quartz, the proofs do not represent merely the absorption of the plate of quartz inserted in the track of the rays, but those of a much thicker plate. The mean total thickness of the prism and the lenses of the apparatus is 21 mm. My proofs have therefore been produced with an uncovered slit under the influence of a stratum of quartz of the thickness of 21 mm., and their parallel proofs consequently show merely how much more light is absorbed by the quartz plate covering the slit. As to the real resistance of the quartz no one of these proofs gives a decision. For this purpose there would be required prisms and lenses of a material absolutely impervious to the ultra-violet rays.

I give subsequently only the results of plates of 3, 20, and 50 mm. in thickness. They show in what degree the mass of quartz retards the action of the most refrangible rays.

Quartz plate 3 mm. in thickness. Aluminium sparks. Width of slit 0·080 mm. Exposure, 2½, 5, 10, 20 secs. One proof at each with and without the quartz plate. Both series differ very little from each other, but the proofs with the plate are uniformly less intense than the others. This distinction is most distinct in the line No. 32, and, as it is quite clear at all exposures, it can be observed there better than in the other lines.

Quartz plate 20 mm. in thickness. Aluminium sparks. Width of slit, 0·080 mm. Exposure, 15, 30, 60, 90, 120, 180, 240, 300 seconds; a proof with the plate at each and a proof without the plate at 5, 10, 20, 40 seconds. In all the proofs the quartz plate has completely absorbed all the rays (Nos. 30, 31, 32), whilst without the quartz plate No. 32 appeared entirely, No. 30 only in 20 and 30 secs., and No. 31 with its less deflected component only in 30 seconds.

Quartz plate 50 mm. in thickness. Aluminium sparks. Width of slit, 0·080 mm. Exposure, 30, 60, 90, 120 secs.; one proof each with the plate, and 5, 10, 20, 40 seconds one proof each with the plate. No trace of the lines in question appeared, just as with the 20 mm. plate.

All other proofs gave similar results.

Hence, in thick strata, quartz is to a great degree sparingly permeable for the most refrangible rays of the ultra-violet. My former proofs of the most refrangible ultra-violet had therefore been under the restraining influence of the prisms and lenses employed. Possibly their want of transparence was mainly to blame for the non-success of the proofs of the spectral region lying beyond 182 $\mu\mu$. As long as I continued working with quartz I could scarcely expect better results than heretofore. To obtain prisms and lenses more permeable for the ultra-violet had hence become an absolute necessity. If I was not willing to occupy myself with the search for suitable materials, I was then restricted to fluor spar. In fact all the subsequent proofs, even those which will be at once discussed, the absorption spectra of gelatine, have been executed with prisms and lenses of white fluor spar.

Faultless fluor spar in colourlesss crystals ranks among rarities. The coloured varieties which are less difficult to obtain are not sufficiently transparent to come into consideration for photographing the most refrangible rays. Moderately large specimens of the colourless material are never optically pure. Cracks, flaws, and other defects occur here and there, and interfere more or less with the optical effect of apparatus prepared from such materials, often, as I have myself repeatedly experienced, to such a degree as to render them useless where the production of clear images is required. It is not too much to to say that to procure large faultless apparatus of white fluor spar must now be classed among impossibilities. Quartz, or even calc spar, may be found of faultless quality much more frequently than pure white fluor spar. Under these conditions the procuring of fluor spar for my spectroscopic apparatus would have been impracticable if Herr Carl Zeiss, of Jena, had not taken a profound interest in my work and assisted me in the most disinterested manner. Although he does not profess to supply fluor spar apparatus, he has given me, besides a large prism(70°), the requisite lenses and closing-plates (plane parallel), all wrought of usually pure fluor spar, and, with the refractive surfaces of the utmost perfection, for the extension of my observations on the ultra-violet. My permanent gratitude is due to Herr Zeiss for this active support, which has yielded in the sequel the most beautiful fruits.

That my expectations depending on the greater transparence of fluorite were released only to a limited extent in that part of the spectrum which has been already observed with quartz, and in the region beyond it not at all, may be here mentioned only in a preliminary manner, and because the following proofs might otherwise readily lead to erroneous conclusions.

B. *In Dry Gelatine.*—In principle and in arrangement the experiment resembled the foregoing. Much time was taken up with the production of the gelatine film, the absorption of which was to be determined.

Soret made use of a watery solution of gelatine, which he placed between the slit and the source of light in a closed trough with parallel sides of quartz; a means equally convenient and certain of obtaining gelatine media of every desired thickness, but applicable only when the presence of water does not interefere. Water, even if recently distilled, is not different in its behaviour with the most refrangible rays. When Soret placed in the track of the rays a trough of 10 mm. in width, the line No. 32 disappeared entirely; whilst, after emptying the trough, when there remained merely the absorption of the two quartz sides, it was visible again (*Archives des Sci. Phys. et Nat.*, vol. lxi. p. 336, 1878). For my purpose, therefore, the use of gelatine in solution was not admissible.

* Continued from page 89.

I made use of dry films of gelatine, which I made from a solution of latine in water. The stouter films of 0·1 mm. in thickness and upards were used without support, but the thinner films were placed upon plate of quartz parallel to their plane. My observations were limited thicknesses of gelatine suitable for silver bromide gelatine. But tention was principally given to such thicknesses as probably occur etween the several particles of silver bromide of the coating of the late.

We calculate in practice for a plate of 13 and 18 cm. side-lengths and 0 cm.^{3} of emulsion fit for pouring, which contained in 100 parts by eight of water five parts by weight of gelatine. According to this proortion I covered with a five per cent. solution of gelatine a plate of quartz laced in a level position. This plate was subsequently used for all lms, and also for taking the absorption spectra. I dried it carefully, nd then measured the gelatine film which I had taken off the middle of he plate with a micrometer capable of showing 0·01 mm. From a umber of measurements the thickness was found to be 0·020—0·021 m., which agreed well with measurements made on emulsion plates by thers. On this thickness, which for the sake of simplicity I will ssume as 0·020 mm., is founded the thickness of all the thinner films, vhich will be referred to below. I did not disguise to myself the fact hat the method, according to which I have determined here and subequently the thickness of the films, might be open to various objections, ut I held the degree of accuracy thus obtained completely sufficient for he purpose in view. I then made solutions containing in 100 parts by weight of water 2·5, 1, 0·5, 0·125, 0·100, 0·063, 0·100, 0·063, 0·004, 0·002 parts by weight of gelatine (Heinrich's hard emulsion gelatine). I poured with a pipette containing 1 cm.^{3} up the above-named quartz plate the same quantity as before, and spread the solution uniformly to the edge of the plate by means of a thin glass rod. The coating was dried in heat, and without any current of air, which, as I had ascertained in preliminary experiments, gives in solutions poor in gelatine layers which become thicker towards the middle of the plate.

The moistened plate, which had previously been carefully levelled, lay on a plate of mirror glass, which rested a few mm. above the water-surface of a hot-water bath, and rested on the edge of the vessel. Above, on the plate of glass, there stood a spacious metal pipe open at both ends and several cm. high, closed above with a second glass plate. The coating of the quartz plate dried consequently in an atmosphere of watery vapour. For the escape of the steam, the loose connexion between the pipe and its glass cover was sufficient. The thickness of the films thus obtained was, on the basis of the above-made assumption, 0·010, 0·004, 0·002, 0·001, 0·0005, 0·0004, 0·00025, 0·00008, 0.00004 mm. I laid bare the dried plate in its middle by means of a clean cut for some mm. in length, and placed it in the camera in such a manner that the slit was covered for half its length with the coated plate, and for the other half for the part of the plate which had been laid bare. Each exposure then gave two spectra, and the difference between the two corresponded to the absorption of the gelatine film. As the source of light there were used Leyden jar sparks of cadmium, zinc, aluminium, thallium, and tungsten. The exposure began with a single spark (opening spark), and was never continued longer than three minutes. The plates this time were those of Dr. Schleussner, of Frankfort-on-Main; the development was as before. The proofs (276) were distributed on sixty plates.

VICTOR SCHUMANN.

(To be continued.)

EXPERIMENTAL NOTES ON PLATINO-BROMIDE PAPER.

[Croydon Microscopical Society.]

THE subject which we have to bring before the members of the photographic section of the Croydon Microscopical and Natural History Club is on the development and toning of a new paper, recently introduced by the Eastman Company, which aims at producing a platinum effect on a bromide paper.

We may say at once that we like this paper very much; it is easy to work, and with suitable development gives, as you will see by the specimens before you, very beautiful velvety black tones, or, as the Company describe them, "engraving black tones," with absolutely pure whites, and a very fine completely matt surface, quite free from the peculiar glistening effect so often seen with bromide papers.

We propose to show you experimentally—1. The treatment of this paper with different developers. 2. The effects to be obtained by toning. 3. The suitability of the paper for the purposes of enlargement.

First, with regard to developers, we have tried nearly all those in use at the present time, but we give the preference to ferrous oxalate and metol for producing the richest and purest blacks. Para-amidolphenol and amidol give very pleasing tones; but in our hands hydroquinone has not yielded very satisfactory results, and we have only used it, as will appear later, in connexion with toning.

We have examples, which we place before you, of the paper developed with these several developers, and will now proceed to expose and develop a few pieces, that you may see for yourselves the action of these different substances.

With regard to exposure, no hard-and-fast rules can be laid down; but, taking the negatives we are using to-night, ten to fifteen seconds at one foot from a No. 4 Bray burner, will be about correct; but so much depends on the character of the negatives, and whether they are equally dense all over or not. In this latter case shading may be had recourse to.

Second, the modification of tone obtainable by toning agents is somewhat limited, and personally we prefer the untoned prints. Those who think otherwise may, by using a bath recommended by the company, and which we brought before you some little time ago in connexion with "Nikko" paper, obtain sepia or brown tones, as will be seen in the specimens before you, the great drawback being the time occupied, *i.e.*, three quarters of an hour or longer.

The other toning process is the uranium one of Weir Brown, as described in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1892, p. 739; or, still better, the modification of it as described by him in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1893, p. 709, which gives a pleasing Bartolozzi red colour suitable for some subjects. The final reduction, *i.e.*, removal of all traces of silver, may be effected either by the well-known Farmer's reducer, or the mixture of potassic ferridcyanide and ammonium sulphocyanide, as suggested by Haddon in the ALMANAC for 1893, p. 710.

Third, this paper is very suitable for enlargements, either by diffused daylight or artificial light, and allows a very fair latitude of exposure. The colours obtained are, of course, similar to those got with contact prints, and the surface is eminently suited to the art of the retoucher.

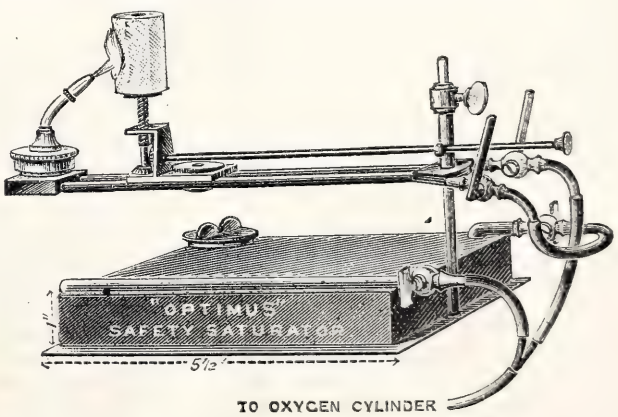
We show you some enlargements on whole-plate paper from quarter-plate negatives, and we have an exposed piece here which we will proceed to develop with any developer you like to name. With the limelight, an 8-inch condenser, a 9-inch rapid rectilinear lens, stop 16, and an enlargement of four superficies, the exposure for this particular negative was 10 seconds.

We will now bring our notes to a conclusion, with the hope that what we have been able to lay before you may prove of some assistance to those who contemplate working this paper. J. H. BALDOCK, F.C.S.

A SAFETY ETHER SATURATOR FOR THE LIMELIGHT LANTERN.

WE are pleased at being enabled to describe this appliance, which we have seen at work on more than one occasion, and which we believe to be as free from all semblance of danger as we know it to be excellent as a means of illumination. It is constructed by Perken, Son, & Rayment, 99, Hatton-garden, E.C., whose first consideration was safety, as an evil reputation for some time hung over some of the earlier saturators.

It will be remembered that these latter had to be made hot in order to vapourise the ether, and in this lay one source of danger; but in the present one the saturator remains quite cold throughout. The cut shows



the construction of this new saturator, in which no accumulation of mixed vapour can exist, there being no chamber for its accommodation, as is found in other saturators; but, on the contrary, the gas passes through a constricted, well-stuffed canal, and is delivered by it direct to the burner. The pure oxygen tube is not run through the body of this saturator, as in other saturators (which in case of leakage might lead to bad results), but goes direct from the Y junction to the burner.

In the "Optimus" saturator, the moment the ether has been poured into the filler and screwed down, the taps may be turned on and a light

applied to the burner, when the lime will at once become incandescent, and yield a superbly brilliant light.

The makers call special notice to the fact that the "Optimus Safety Saturator" is, for the express purpose of avoiding heat, made very flat, and is in shape like the tray ordinarily used with the oxyhydrogen lime-light, and placed at the bottom of the lantern, so that no danger can accrue from overheating. Its tray-like shape, and the fact that it has an upright column or pin for the support of the jet, fits it to fulfil the duty of a tray when both oxygen and hydrogen are in use.

The length of the saturator is five and a half inches, the width three and a half inches, and height barely one inch; it therefore goes without saying that it will readily fit into any of the lanterns now existing with four-inch condensers.

The saturators hitherto known have taps to stop the ingress of oxygen but possess only imperfect or no means whatever for cutting the gas from their capacious mixed-vapour reservoir off from the burner. This serious omission has been remedied in the "Optimus" Safety Saturator, for, as will be seen by the diagram, it possesses one tap to control the inlet of oxygen, and a second to control the outlet of mixed gas, thus forming at any moment the complete isolation of the chamber from the burner, which is further safeguarded by the jet taps.

For use with a biunial the saturator *must* be placed in the bottom lantern, an extra jet and tray being put into the top one. and the dissolving done by the usual dissolving tap.

Instructions for use are supplied with each instrument.

Our Editorial Table.

Traité de Photographie Stéréoscopique, Théorie et Pratique.

By Dr. A. L. Donnadieu.

Paris: Gauthier Villars et Fils, Quai des Grands Augustins, 55.

Possibly the best thing we can say of Dr. Donnadieu's *Treatise on Stereoscopic Photography*, is that we wish its analogue existed in English. The book before us is undoubtedly the completest devoted to the theory and practice of the subject, and in many senses is the handiest, that has been published. In passing, we note that not only in France, but in Italy, Switzerland, Austria, Germany, and other countries, stereoscopic photography is just now engaging much attention, so that the need for a comprehensive work on the topic is manifest.

Prefacing his Treatise by a brief history of the stereoscope, which differs only in a few respects from what is given in Brewster's work, *The Stereoscope* (a volume somewhat generously laid under contribution by Dr. Donnadieu in other parts of his book), the author first of all discusses ordinary vision and some of its phenomena, and then passes to stereoscopic vision, in the theory of which he endorses Brewster. Suitable subjects for stereo-photography, developers for the plates, stereoscopic cameras, stand and hand, both of the latter in great variety, are fully described and illustrated. A special chapter is devoted to the choice of lenses, simple methods of testing them for identity of foci being mentioned, and then the principles of perspective, in so far as stereoscopic photography is concerned, are discussed. The separation of the lenses on the camera front comes in for a lengthy discourse on the principles involved, the author ultimately recommending that the objectives should be separated at a distance equal to the half of the baseline of the entire plate used, thus ensuring that each lens is placed exactly central to each half of the plate. Dr. Donnadieu demurs to the separation being a fixed one, approximating to the distance between the eyes, as unsound in theory and practice. The stereoscopic camera in use, the negative, printing, transposition of the halves of the prints, trimming and mounting, transparencies by contact, and camera printing are successively dealt with very fully, and, in the main, Dr. Donnadieu's recommendations resemble those which we have from time to time published in these columns, and which are adopted by the majority of workers. To this there is, however, one exception, and that, in the trimming of the two pictures, Dr. Donnadieu's system of cutting leaving the dissimilar views apparently alike as regards inclusion of subject, on account of the two sides of the prints which come together not having more of the subject than the sides which do not. The reverse of this is usually done in this country, with advantage to the effect obtained. A final section of the book is occupied with the theory and construction of the stereoscope, of which a number of ancient and modern forms are described and illustrated. Not the least valuable and interesting part of the publication is a separate atlas of twenty collotype stereographs which accompanies the Treatise as a supplement. These twenty stereographs show the reader what binocular negatives and prints from them are like, illustrate the effects of decentering the lenses, using lenses of non-identical foci, exaggerated separation, mounting the lenses at different heights on the camera front, and otherwise show what to avoid in the selection and taking of stereoscopic negatives.

We have perused Dr. Donnadieu's work with great pleasure. The author has mastered his subject and has handled it with ability. The charm of stereoscopic photography will, we hope, be brought home to many by this capital Treatise.

Das Gesammtgebiet des Lichtdrucks die Emailphotographie.

By J. Husnik. Vienna: A. Hartleben, Seilerstätte, 19.

A new edition of Husnik's able and exhaustive work on collotype has been issued, much new matter, the accumulation of nine years, that is since the publication of the last edition, having been added. A section of the work is devoted to "natural colour" collotypy, and some examples of the various colour printings are given. The book is replete with practical details of the highest value.

Le Matériel de l'Amateur Photographe.

Par G. H. Niewenglowski. Paris: Gauthier Villars et Fils, Quai des Grands Augustins, 55.

M. Niewenglowski, in simple terms, treats of the choice of the lens, the camera, the stand, materials for the dark room, accessories, describing their essential points and giving methods for testing them. The brochure, which was written for amateurs, should achieve its object of being useful to them.

Manuale Pratico de Fotografia alla Gelatina-Bromuro d'Argento.

Di G. Santoponte. Leghorn: Raffaele Giusti.

In the space of 164 pages Signor Santoponte gives a mass of information the extent of which is not to be gauged by the comparatively small limits within which it has been condensed. Photographic optics, negative-making, printing, transparency work, enlarging, the hand camera, stereography, photo-mechanical printing, the optical lantern, and many other subjects are concisely but clearly treated of, and the book has several illustrations.

Photographisches Notiz und Nachslage Buch für die Praxis.

By Ludwig David & Charles Scolik. Halle-a.S.: Wilhelm Knapp.

This is a collection of practical notes, formulæ, and recipes relating to negative-making, printing, and other departments of photography, selected with considerable care and judgment. The volume is nicely printed and got up, and is embellished by a number of exquisite little photogravures, among them being a portrait of Dr. J. M. Eder.

News and Notes.

We are informed that Messrs. R. W. Thomas & Co. have disposed of the patent rights of the Sandell plate for Germany to a firm of German plate-makers.

The business of Messrs. Disderi & Co., 4, Brook-street, Hanover-square, W., with the goodwill and negatives, has been transferred to Mr. T. Fall, 9 and 10, Baker-street, Portman-square, and 6, Fitzjohn's-promenade, Finchley-road, N.W.

The *Practical Photographer* is now under new editorship. The April issue will have a permanent increase in the number of pages, and also in the number of illustrations. The price will be increased to twopence monthly. A large number of prizes are being offered for designs, &c.

At the Polytechnic Institution, Regent-street, Mr. Valentine Blanchard is conducting a practical class in studio posing and lighting, and is also giving a course of six lectures on *Art in connexion with Photography*. The class and lectures are given on Mondays. Further particulars may be obtained of the Secretary, Mr. R. Mitchell, 309, Regent-street, W.

To-night, Friday, March 9, Mr. E. Howard Farmer will deliver a lecture on *Exposure Meters and a New One* at the Central Photographic Club, Coleman's Hotel, 13, Henrietta-street, Covent Garden, at eight p.m. Next Friday a smoking concert will be held under the direction of Messrs. Bedding, French, and Teape. Tickets for either can be obtained from the members or the Hon. Secretaries.

WATSON'S CAMERA STRUT.—This strut has been designed to use with long-focus cameras, so as to render them perfectly rigid, even when carrying heavy lenses and extended at their fullest. It consists of a plain lath of ash, hinged at each end; on the top end is attached to the hinge a hook, to engage with the front of the travelling baseboard, and at the bottom end a block, which slides between the parallel legs of a tripod stand. It is so arranged that, as the camera is racked in and out, it slides up and down, and, when the focus is found, it is only necessary to clamp the screw secure in the strutting position, and a perfectly rigid bracket is arranged from the stand to the front of the camera.

MESSRS. ADAMSON & SON, of Rothesay, are erecting additional premises and machinery for working the collotype process. At a Dean of Guild Court on Monday last, before Dean of Guild Miller, Ex-Provost M'Millan, Councillors Aitchinson and M'Bride—plans were submitted by Messrs. Adamson for erecting additional premises adjoining the studio, to contain plant and machinery for reproducing photographs, &c. The plant includes two collotype printing machines, a guillotine cutting machine, hot-water heating apparatus, gas engine, &c. We understand that the two businesses are to be worked separately, the new department being carried on under the name of the Rothesay Collotype Company.

DON'T HURRY DEVELOPMENT.—Few beginners, says *Photographic Scraps*, recognise the great benefit to be derived from a deliberate slowness in developing. There is too much haste to see results—a too eager press to get a negative of any kind. Be the exposure what it may, nothing is lost, but much gained, by so compounding the developer that at least five minutes is spent before the image begins to show signs of being fairly well out. Quick development means a lack of gradation—a forcing up of the higher lights before the less-exposed parts are acted on. The roundness and gradation necessary for a good result is only obtainable by slowly and carefully coaxing out the detail, so that all parts of the image come up fairly together.

A LIVING LANTERN SCREEN.—An attractive and, so far as we know, a novel use for the lantern has been found by an enterprising theatrical manager of a provincial pantomime touring company. The inevitable skirt-dancer, having postured and pirouetted upon a half-dark stage, at a given moment reaches a prearranged spot; the lights are still more lowered, the swirling skirts are suddenly arrested, and, using her extended feet and hands, a five-feet square lantern screen is instantaneously, as it were, improvised. On this, by means of a powerfully lit lantern, a transparency is deftly projected of a local celebrity. A quarter of a minute later this living lantern screen is careering round the stage, to return again and again, at short intervals, and mirror the various magnates of the particular town in which the performance is given. Judging from the applause with which the above performance has been received, there is money in the idea.

BUBBLES. — *Apropos* of this subject, Mr. Cadett, in *Dry Plates*, says: We cannot too strongly call attention to the importance of care, especially when the developer has been only a short time on the plate, in preventing, during rocking, the developer from flowing off a part of the plate. Should this happen only for a few seconds, a crop of bubbles is the immediate result, and they cling with surprising obstinacy. Also, the developer should be poured over the plate in one sweep along the edge. If poured in the middle of the plate towards one side, the developer will form a line of developing bubbles on its return flow. To the initiated these remarks may seem superfluous, but, as manufacturers, we can testify, from our considerable correspondence on these subjects, to the general want of knowledge of these little matters, and, perhaps more than in any other department of the art-science, does successful photography depend on attention to trifles.

A SOCIETY FOR AINTREE.—The inaugural meeting of the Aintree and District Society of Photographers and Lanternists (Liverpool) was held on Thursday evening last at the Club-room, "Sunnyside," 13, Moss-lane, Aintree. Mr. L. E. Bennett occupied the chair. The first portion of the evening's business was the election of officers, the following gentlemen being elected:—*President:* Mr. W. B. Hellon.—*Council:* Messrs. R. M. Owen, W. R. McKerlie, W. Lockier, J. A. Gee, G. H. Jackson, and J. Harris.—*Treasurer:* Mr. D. Neill.—*Hon. Secretary:* Mr. C. H. Adkins, 28, Orrell-lane, Aintree. Afterwards an excellent exhibition of lantern slides made by the members was given, the lantern being well managed by Mr. T. Beer. During the evening songs were skilfully rendered by Messrs. R. M. Owen and A. J. Caufield. Mr. G. H. Jackson accompanied. The Chairman, at the close of the proceedings, congratulated the members on their evening's entertainment, and said that the whole tenor of that meeting had given good omen for the future of the newly formed Society.

WOOLWICH POLYTECHNIC. — Pictorial Photography:—A Course of Four Popular Lectures on Picture-making by Photography, under the respective headings, Motives, Materials, Methods, and Morals, will shortly be given by Mr. A. Horsley Hinton. The following is the syllabus:—I. Motives.—The genesis of a photograph, the inception of a picture, what should our motives be? the objects for which photographs are made, the importance of a definite motive, definition of a "picture," craft and art. II. Materials.—What we make our pictures *with*, what we make our pictures *of*, the proper use of camera and lens for pictorial work, the relationship between the apparatus and the photographer, the function of Nature's models, light and shade, the heavens, the earth, and the figures thereon. III. Methods.—Choosing our subjects, Nature through a lens, and the end in view, selection and composition, some rules for guidance, conventionality, originality, and eccentricity, the camera in the field and at home, development of the image, printing methods, use and abuse, the cultivation of our perceptions. IV. Morals.—A brief retrospect, the limitations of photography, how Nature impresses us, a useful analysis, photography as a means of artistic expression, the kinship of the arts, some refinements in photography, "a thing of beauty" and "a joy for ever."

LEIGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.—The Society held their first Exhibition on Wednesday and Thursday of last week in the Assembly Rooms, Leigh. The rooms were crowded during the whole time the Exhibition was open, and was visited by over 3500 people. The rooms were barely large enough to display the whole of the views, yet the display was hung in an effective and artistic manner. Mr. T. L. Syms was to the fore with a splendid selection of portraits and *genre* studies, Mr. R. Leigh with a show of platinotypes of local street views; Mr. Thomas Haddock had a nice show on Whatman paper, toned with platinum; Mr. W. Hampson had on view a selection on Ilford matt P.O.P.; Mr. W. R. Moore some enlargements on Nikko paper; Mr. and Mrs. Miles F. Burrows a nice show on platino-bromide, as well as some lace mats with Welsh views in the centre, were greatly admired, Mr. W. Crouchley and Mr. J. West showing portraits; Messrs. T. G. Hirst, J. Berry, R. Yates, A. E. Bennett, T. Green, R. B. Mawson, and T. Peters were amongst those who deserve special mention. The Southport Social Photographic Society lent thirty frames of their prize-winners. There were over 400 prints exhibited, and the Committee were astonished at the success of this their first Exhibition, and for a Society in its second year the result is certainly very encouraging.

THE shareholders of the Eastman Photographic Materials Company, says the *Investors' Guardian*, may regard the situation with much complacency. Amateur photography is growing by leaps and bounds, and the camera will soon become as indispensable a piece of furniture in every house as the long-suffering pianoforte. Already the expressive verb "to kodak"—derived from this Company's renowned Kodak camera—has been added to the language, and the mania for taking snap-shots is raging with increasing violence. Such a Company, therefore, as this, with its headquarters in London and Paris, and with a world-wide reputation, cannot fail to gain handsome profits in the future. In 1893 the amount earned was sufficient to pay ten per cent. on the preference shares, and a good dividend on the ordinary, but, with commendable prudence, the Directors decided to write off the sum of 6127*l.*, representing advertising, experimental account, and Paris and Nice establishment expenses, 1892. After this clean sweep, which leaves the Company's finances in a sounder condition, there remains a sum sufficient to pay a five per cent. dividend on the preference shares. The current year should be a great improvement on 1893, as even the manufacture of photographic materials was affected by the prevailing depression, and both preference and ordinary shareholders will, we believe, be on good terms with themselves a twelvemonth hence.

SIR HENRY THOMPSON, the eminent surgeon, has, the *Observatory Magazine* states, offered the sum of 5000*l.* sterling to the nation, through the Astronomer Royal, for the purpose of buying a telescope for Greenwich Observatory. It is not often Astronomy finds such a generous patron, on this side of the Atlantic at least, and, moreover, one who can so well appreciate the exact needs of the science at the moment; for Sir H. Thompson, foreseeing that the astronomy of the future is to be photographic, and feeling that England should be well equipped in this arm, makes it a condition of his gift that the telescope is to be expressly designed for photographic purposes. So far as the plans are made, and subject to the acceptance of the offer by the Government, the instrument is to be of twenty-six inch aperture, just twice that of the telescopes used for the Photographic Chart of the Heavens—in fact, the instrument is to be made from the model of the Astrographic Equatorial, but of exactly double the dimensions in every particular. The guiding telescope for the new instrument will be the twelve and three-quarter inch Merz refractor, with a light tube; and the nine-inch photographic objective, presented by Sir H. Thompson to the Royal Observatory some years ago, will also be carried on the same mounting, for use as a photo-heliograph, as at present. The new instrument, when completed, will be housed under the Lassell Dome, on the top of the central octagon of the new Physical Observatory, now being built in the south grounds of the Royal Observatory.

LORD RAYLEIGH ON ACHROMATISM.—In the course of his fourth lecture on *Light* Lord Rayleigh said that Newton, in his *Optics*, carried original research into the phenomena of light a very long way, so that what has been done since his day by no means overshadows the foundations he laid. But he went wrong over one point, nevertheless, and that was "achromatism." Everybody must have noticed that in a common single lens the image is more or less blurred with a rainbow-tinted outline. This is due to the fact that such a lens not only bends or refracts the rays to a common focus, but goes further, and to some extent acts like a prism, and disperses them. Newton's experiments led him to the erroneous conclusion that the dispersive effect of a prism was in direct proportion to its refractive effect. So he spoke of the chances of ever obtaining an achromatic telescope (refractor) as "desperate," and turned his attention to improving reflecting telescopes. Huyler later on declared that it must be possible because the human eye was achromatic. But he was wrong; the human eye is not achromatic, a fact quite consistent with its manifold other defects as an optical instrument. However, Mr. Dollond and Mr. Chester Moor-Hall ultimately showed how the annoying chromatic effects could be avoided by using two lenses of different materials, one of crown and the other of flint glass. Lord Rayleigh sent a beam through prisms of crown and flint glass respectively, to show that, while the dispersive effect of both is the same, the refractive effect is much less in the case of the flint glass. An additional lens of this latter material is therefore used to restore the aberrant rays proceeding from the crown-glass lens to their correct position.

THE annual meeting of the Photographers' Benevolent Association was held at the rooms of the Photographic Society of Great Britain on February 28. In the absence of the President (Mr. George Mason, of Glasgow), Mr. A. Mackie, Chairman of the Committee, presided. The Secretary read the Report of the Committee; Mr. Freshwater proposed, and Mr. Hume seconded, the adoption of the Report. Mr. Charles Faulkner suggested that in the balance-sheet the names and details of subscriptions under 1*l.*, as well as of the larger ones, should be given. The Hon. Treasurer, Mr. J. Spiller, said this was a question which would arise on the balance-sheet, and the Committee's Report was then adopted. In proposing the adoption of the balance-sheet, Mr. Spiller said he was afraid many would be offended if their names were printed in connexion with small sums. Dealing with the details of the balance-sheet, he pointed out how largely the Society had been indebted to what might be called casual sums from exhibitions held, and collections made by photographic

ocieties, from collections made by different journals, and so on. He wished to pecially mention Mr. Charles Job, who had contributed a large number of prize winnings, amounting in the aggregate to a very helpful subscription, and to Mr. George Mason, the President, for strong personal as well as financial support. He pointed out that the Society must make special efforts to increase its income, as this year the expenditure in grants and loans had considerably exceeded the receipts, although great care had been used in distribution. Mr. Faulkner then again brought forward the question of publishing the smaller sums in detail, which he thought would be likely to increase the interest in, and the income of, the Society. A long discussion followed, at the close of which Mr. Faulkner moved, and Mr. Child Bayley seconded, the resolution: "That in future the names of all subscribers, and the amounts of their subscriptions, be included in the balance-sheet." Carried *nem. con.* The election of officers was then proceeded with, and resulted in the re-election of Mr. George Mason, as President, Mr. J. Spiller, Treasurer, and the following Committee:—Messrs. R. Child Bayley, Robert Becket, F. H. Berry, Charles Faulkner, G. T. Harris, P. G. Hunt, A. Mackie, J. S. Rolfe, R. P. Drage, T. E. Freshwater, H. R. Hume, W. Fenton-Jones, E. W. Parfitt, and W. E. Ward. Auditors: Messrs. Thomas Bedding, Thomas Samuels, J. Guardia, and E. J. Wall. Votes of thanks were passed to the Auditors, Secretary, and Chairman. At the subsequent Committee meeting, the following applications were considered:—First application was from a printer who had been out of work most of the winter, discharged owing to decreasing business by a firm with whom he had worked seventeen and a half years. A grant of 2*l.* for immediate relief, and the Secretary instructed to take what further steps seemed necessary. Second application was from a photographer who asked for legal assistance, as his case, on the evidence he himself gave, seemed absolutely bad. The Committee refused this. Third application: From an assistant out of work; asked for a loan of 5*l.* to pay arrears of rent, and to meet immediate expenses. The case was thoroughly considered, and the Committee decided to grant 1*l.* forthwith, and 10*s.* per week for three weeks. Fourth application: From a manager who had been long out of work, but who had a situation to go to, and asked for 5*l.* to enable him to redeem his clothes, &c. This was granted. Messrs. James Wright, C. Mitchell, and Thomas Samuels were accepted as subscribers.

Swinden's New Hand Camera, the "Monarch."—We have been shown this new hand camera, by Mr. Swinden, the plates in which are carried singly in patent sheaths of ingenious construction. The whole of the sensitive medium of the plate is exposed without any projections over it whatever, and the camera is filled with the sheaths in daylight, thereby doing away with the inconvenience of charging the camera in the dark room, as is necessary with other makes. Film-carriers are made to fit in the sheaths, so that those who have a preference for this class of negative have an instrument enabling them to use either films or glass as they may feel disposed. The method of exposing the sensitive media is exceedingly simple. A small lever on the outside of the camera is turned forward and then backward, which movement opens and closes the sheath, which is afterwards removed and placed in the rear, and the next in rotation for exposure merely requires to be raised about half an inch and pressed down, when it becomes fixed in correct focal position, ready for manipulation in the same manner as the preceding one. A spring follower indicates the number of plates remaining unexposed. The camera measures, outside, $9\frac{3}{4} \times 5\frac{1}{2} \times 4\frac{3}{4}$ inches. As the majority of photographers do not expose more than eight plates on an outing (except occasionally), it is made to carry this number, it being considered an advantage to be able to dispense with bulk and weight. This arrangement does not, however, limit the number of exposures; any number may be made if desired, as the sheaths, being very portable and light-tight, can be replaced by others in the brightest light. The camera is entirely covered in morocco leather, and is highly finished throughout.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4079.—"Improvements in Hand Cameras for Photographic Purposes." H. Aland and F. Beauchamp.—*Dated March*, 1894.

No. 4222.—"An Improved Magazine Camera." W. A. Edwards.—*Dated March*, 1894.

No. 4259.—"Improvements in Masks" (Photographic). N. G. Thompson.—*Dated March*, 1894.

No. 4276.—"Improvements in the Manufacture of Photographic Printing Plates." A. Zimmermann.—*Dated March*, 1894.

No. 4123.—"Improvements in the Construction of Line Screens for the production of Half-tones in Photographic Printing Processes." Complete specification. R. Schorr.—*Dated March*, 1894.

No. 4346.—"A New or Improved Method or Means of Photographing in Colours." F. Slavin and S. Pollastrini.—*Dated March*, 1894.

No. 4324.—"Improved Means for Displaying and Illuminating Semi-transparent or Transparent Photographs and other Semi-transparent or Transparent Pictures." J. C. Shannon.—*Dated March*, 1894.

No. 4401.—"An Improved Frame or Show-case in which to Exhibit Photographs, Pictures, and Objects of Interest, and by Means of which Advertisements are more attractively Displayed." J. Hetherton.—*Dated March*, 1894.

No. 4406.—"An Improved View-finder, with Removable Mirror." W. Tylar.—*Dated March*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
12	Camera Club	
12	Lantern Society	
12	Norfolk and Norwich	
12	North Middlesex	*Print-out Processes.* S. Herbert Fry.
12	Putney	
12	Richmond	
13	Birmingham Photo. Society	
13	Great Britain	*A Note upon the Intensification of Platinum Prints.* E. J. Wall.—Col. Gale will show a selection of lantern slides.
13	Hackney	Smoking Concert in Club Room.
13	Manchester Amateur	
13	Newcastle-on-Tyne & N. Counties	
13	Paisley	
13	Rochester	
13	Stockton	
13	West London	*Applied Photography.* G. C. Haité.
14	Ipswich and Suffolk	
14	Leytonstone	*What can be Done with the Hand Camera.* Walter D. Welford.
14	Munster	
14	Photographic Club	Members' Open Night.
14	Southport	
14	Stockport	
15	Ashton-under-Lyne	Annual Meeting.
15	Birmingham Photo. Society	
15	Camera Club	
15	Ealing	*Flashlight.*
15	Glossop Dale	
15	Greenock	
15	Hull	
15	Leeds Camera Club	Demonstration: *Enlarging.* Messrs. Swinden, Vevers, Grayson.
15	Liverpool Amateur	*Bromide Paper Enlargements.* J. L. Mackrell.
15	London and Provincial	
15	Oldham	
15	Oxford Photo. Society	
15	Woodford	*Cloud Negatives.* H. W. Bennett.
16	Cardiff	
16	Central Photographic Club	Smoking Concert.
16	Croydon Microscopical	
16	Holborn	
16	Kilmarnock	*Application of Photography to Wood Engraving.* J. Munn.—*Making of Lantern Slides.* F. Ferguson.
16	Leamington	
16	Lewisham	Lantern Evening.
16	Liverpool Amateur	*Enlarged Negatives.* J. L. Mackrell.
16	Maidstone	
16	North Kent	
17	Hull	
17	Leytonstone	Open Social Evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

February 22,—Mr. H. M. Smith in the chair.

The death of Mr. A. M. Levy having been announced, a vote of condolence with his mother was passed.

Mr. Haddon passed round a print from a negative, the latter having been obtained by moonlight with an exposure of three hours, at full aperture of a rapid symmetrical lens, a quick plate having been used. The print showed remarkably good definition, and in general it was indistinguishable from a print from a good daylight negative. The subject photographed was a portion of the Royal Naval College.

After Messrs. Taylor and Green had shown their electric lamp, a discussion on the Affiliation Committee of the Photographic Society of Great Britain took place, members undertaking to contribute slides, and the Association voting a continuance of its support to the scheme.

March 1,—Mr. R. Child Bayley in the chair.

The evening was devoted to an exhibition of members' work, examples being shown by Messrs. W. D. Welford, C. H. Cooke, P. Everitt, T. E. Freshwater, E. H. Bayston, J. S. Teape, Foucard, W. J. Rawlings, G. T. Harris, S. J. Beckett, and others.

PHOTOGRAPHIC CLUB.

February 28,—Mr. J. R. Gotz in the chair.

Mr. J. Bulbeck, of Havant, was unanimously elected a member.

Mr. F. A. Bridge gave particulars of the proceedings at the recent meeting of lanternists at the London Chamber of Commerce, stating it as his opinion that what transpired was calculated to reassure the users of gas cylinders.

Mr. H. W. Sanford showed a negative which had become blistered since development.

Being a Lantern Night, slides by Messrs. Medland, Bridge, Bridgman, Malby (a visitor), Tottem, and others were shown.

Central Photographic Club.—March 2. Mr. E. J. Wall in the chair.—Mr. C. F. Robinson of the Carlotype Company gave a demonstration of *Mezzotype*. The paper he said was a plain silver one, and after printing was washed in water to remove the free silver. Soaking in the washing water

tended to produce yellowness in the prints. Any toning-bath could be used, but would have to be weakened down. Prints should be removed while still warm in tone on the surface; if left till cold in tone on the surface, they would be too cold when dry. Failure was more likely to occur with gelatine papers than with this. After toning, prints should be washed thoroughly five or six minutes under a tap. Fixing should be done in two baths; in the first for half an hour. Prints should not be left to soak in the first washing water, otherwise fixing would still go on. As the paper is very thick and absorbent, therefore thorough washing was most necessary. To produce sepia tones he had experimented in all sorts of ways. Hyposulphite and a little gold gave something of the kind, but the nearest approach to sepia he had obtained by using the following bath:—Chloride of palladium solution, 20 drops; citric acid, 60 grains; water, 10 ounces. Toning was completed in about five minutes, but the prints did not tone much more when left for a quarter of an hour. More palladium was added from time to time in the same manner as gold. Vigorous prints were required to start with. Tone to a purple colour, wash and treat with a carbonate of soda bath and fix. Colder tones were obtained by dipping the prints for thirty seconds in an ordinary platinum bath, which lowered the tone. Before toning with either palladium or platinum it was advisable to place the prints for thirty seconds in a salt-and-water bath and then wash for about five minutes. The paper had been on the market for two years and but very slight change had occurred in the prints first made, and he believed them to be permanent. For mounting he used white dextrine, mixed as it was required. Rev. A. H. Blake used the bitartrate of soda bath recommended by Mr. E. J. Wall some time back. In toning with platinum he omitted the nitric acid and got better tones. Mr. J. W. Slater found the paper toned very quickly. For mounting he used thin glue. In answer to Mr. Avery, in some of the earlier paper small white spots occurred, which arose from metallic particles in the paper, but this difficulty had been removed. Mr. E. J. Wall used salt-and-water bath first for both gold and platinum toning, strength 2 ounces to the print. The first washing water afterwards should be changed quickly. He found it an improvement to compound the fixing-bath of hypo one to eight and then adding an equal quantity of sulphite—not bisulphite of soda. The best sepia tones he got by using a weak acetate and gold bath. In platinum it was necessary to get rid of all the free nitrate of silver, otherwise they combined and caused yellowness. Nitric acid in platinum toning caused slightly yellow whites. In palladium toning it was best to neutralise the chloride solution with carbonate of soda, and then to acidify it again, in order to prevent any hydrochloric acid being set free. The paper could be developed like gelatino-chloride papers with acid hydroquinone, but owing to the thickness of the paper it was difficult to avoid stains. In answer to inquiries, Mr. Robinson said the Company were preparing a rough-surface (Art) bromide paper coated on Whatman paper. It was suggested that, when the paper printed red, sepia tones were obtained by simple fixing in hypo. The remainder of the evening was devoted to the exhibition of members' slides by Messrs. Bull, Medland, Oakden, Wall, and others.

Ealing Photographic Society.—March 1, Monthly Lantern Evening, Mr. H. W. Peal in the chair.—The lantern was manipulated by Mr. C. N. Peal and Dr. Clifford Sibbons. The feature of the evening was a set of slides of Teneriffe, shown by Mr. T. Simpson, who gave an able and most interesting description of them and of his recent visit to that island. Views of Egypt, by the President, followed, then slides by a youth of thirteen, showing much promise; slides by Mr. Crisp (various), his flower studies being much admired; Mr. Richards' *Thames Scenery*, and Mr. Charles Whiting's *Buckingham Palace interiors* and various parts of England, all showing his well-known skill.

Hackney Photographic Society.—February 27, Mr. Puttock in the chair.—Mr. Grant presented the Society with an electric signal for use in lantern lectures. Mr. Dean showed his method of taking photomicrographs. Work on Kloro paper was shown by Mr. Selfe, and a print on Eastman's platino-bromide paper by Mr. W. Smith. Mr. F. W. Hindley then gave his lantern lecture on *Ireland*. The slides exhibited were very good, and their value much enhanced by the lucid explanation given by Mr. Hindley.

Leytonstone Camera Club.—February 28.—A lecture on *Colour* was given by Mr. A. P. Wire. There was a very good attendance, and the lecture was listened to with marked attention. The chair was taken by the President (Dr. Turner). Mr. Wire, in a few prefatory remarks, said that he had no intention of touching upon colour photography, but would endeavour to explain, as far as lay in his power, the various principles underlying colour. Colour existed all around us, and every person perceived it in a more or less degree. The colour sense required educating. This power of perceiving and appreciating colour was possessed in various degrees even by nations, and, in illustration of the love of colour, the Celts and inhabitants of Eastern countries were mentioned, whilst the Teuton was said to be deficient in this respect. The lecturer then gave a description of the wave theory of light, and clearly demonstrated his remarks on the blackboard. By means of the oxyhydrogen lantern, a sectional picture of the eye was thrown upon the screen, and the lecturer described the faculty of sight. Diagrams, illustrating the refraction of light and other physical phenomena connected with this subject, were also projected on the screen, and explanations given. A most successful experiment was that of breaking up a ray of light by means of a prism, and thus Newton's experiment of the spectrum was beheld by those present. The intermixture of colours was then demonstrated by means of coloured designs placed upon a whirling disc, and many curious effects were the results. The projection of one colour upon another was shown by means of some specially prepared lantern slides and the aid of a mirror, these experiments being much appreciated by the audience. Perhaps the most taking experiments of the evening were those in which the lecturer placed coloured stars on the screen, and, after gazing at them for a time, on their removal the complementary colours were distinctly visible. The lecture was concluded by a display of the monochromatic light, which gave every person in the room the appearance of unearthly creatures, and great amusement was caused by noticing the disappearance of colours in some brilliantly coloured pictures, which had been fixed up in the room for this purpose. By means of a piece of magnesium ribbon, these colours were instantly recalled, and this heightened the effect. The lecturer sat down amidst applause. An interesting discussion followed. Mr. Tom Symmons said he had enjoyed the lecture much, and fully corroborated the lecturer's statement as regarding the education of the colour sense. This was very noticeable, he remarked, when comparing the earlier and later works of many painters. Remarks were also made respecting colour blindness. Mr. Tabor, giving Mr. Wire great credit for his experiments, made some very pertinent remarks, which fully bore out his statement that he had studied physics for many long years. After several other members had taken part in the discussion, Dr. Turner gave the members a brief outline of modern advancement in respect to the knowledge of the structure of the eye.

North Middlesex Photographic Society.—February 26.—Mr. R. Child Bayley gave a demonstration of *Amateur Plate-making*. While performing the various operations he kept up a most lucid explanation, which was particularly plain and complete. He demonstrated the mixing of the various ingredients, the boiling of the mixed emulsion, explaining the method of testing the colour shown by transmitted light, the washing of the emulsion, and the coating of the plates. He proved that the apparatus required was by no means costly, his outfit consisting of a couple of penny mugs, two glass flasks, a glass funnel with a piece of indiarubber tube, and a lamp glass, the latter being used as a filter by tying a piece of chamois leather over the end. An eruption of plate-making is confidently looked forward to.

Woodford Photographic Society.—March 1, the President (Mr. H. Wilmer) in the chair.—Mr. Noble showed some negatives taken on Cadett's lightning plates, which were much admired. Mr. Caird showed an adjustable frame, by means of which lantern slides could be printed from any part of a negative of any size. The subject of masking and binding lantern slides was then introduced by Mr. Malby, who showed the method in which he is in the habit of doing the work. His masks consisted of strips of a thin opaque paper, of a dark brown colour. The strips were fastened on the side by means of a touch of gum at the corners. By the use of strips instead of cut-out masks, he was able to adjust the size and the opening so as to suit the subject and the slide. After the gum had set, the projecting portions of the strips were trimmed off with a pair of sharp scissors. The strips used for binding were prepared by Mr. Malby himself. He used a thin and strong sample of bank-post paper, gummed in sheets with gum arabic. The sheets, after being gummed, are laid down a number together on a piece of glass, and the strips, marked off by a pair of dividers, are cut through by means of a straight edge and shoemaker's knife. They are cut a little longer than the side of the slide, and are moistened on the back first and then on the front, and laid down on a piece of tinted paper. The dots are put on the masks with a touch of gum, the cover glass adjusted, and the slide, held between two fingers, is lowered down on to one of the strips, the end trimmed to length, and then rubbed down with a piece of soft calico, known as null, made into a pad. The opposite side of the slide is then similarly treated, and it is laid down to dry while other slides are being brought to the same stage. The results were very admirable, and elicited a good deal of praise.

Ashton-under-Lyne Photographic Society.—February 28.—Mr. S. Herbert Fry, of the Paget Prize Plate Company, delivered a lecture before the above Society on the working of the Paget Prize Printing-out Paper by development.

Birmingham Photographic Society.—February 27.—Mr. G. H. Dugard, of the Sutton Coldfield Camera Club, gave a paper and demonstration to this Society upon the working of dry-collodion plates. After referring to the drawbacks and disadvantages of the earlier experiments in the use of the process, and the recent improvements and developments made in the invention, he described the various stages of working, from exposure to completion, and practically illustrated his paper by making a number of slides and transparencies, which were exposed to magnesium ribbon light. He also exhibited an interesting collection of pictures made on collodion plates at various periods during the past fifty years—from the early stages of the wet process to the latest improvements of dry plates—after which a number of slides, made upon dry-collodion plates, were shown through the lantern.

Leith Amateur Photographic Association.—February 27, Annual Popular or Open Meeting, Mr. William Dougall in the chair.—In the course of his introductory observations, the Chairman stated that the Association continued to justify its claim to exist. While they could not boast of many high scientists or men of great learning on their roll of membership, yet they managed to keep abreast of the photographic record of time. No new process was introduced but it at once engaged the attention of the members; no novelty in the way of apparatus found a place in the market but it was exhibited at their meetings. This was, no doubt, due to the unflagging skill and zeal of their able Secretary, Mr. Pitkeathly. During 1893 they had the pleasure of witnessing demonstrations in the manipulations of newly introduced plates and papers by their more advanced members, and of listening to discussions on the merits and demerits of the many products known by fearful and wonderful names which had recently been introduced for the purpose of developing the photographic impression, and they also had a number of able papers on subjects photographic and closely allied to the art. Their membership, notwithstanding deaths, removals, resignations, &c., still remained at forty. For this evening's exhibition of the members' work, taken during the last year, they had been enabled, by alterations in the projection lantern, to have it at the furthest end of the hall, and so were enabled to have the platform free, and more pleasant for the lecturer, vocalists, or pianist. During the coming year, it had been decided to organize a series of competitions for the best work of the season, the details of which would be made widely known. The Association would award gold, silver, and bronze medals struck from a die designed by one of the Vice-Presidents, Mr. Smith, and which carried upon its face the good old motto of the town of Leith, "Persevere." This evening they would be able to show them somewhere about one hundred and eighty slides, and the monotony of pleasing the eye would be varied by trying to please the ear also, with songs from Miss Ford, Mr. H. Turnbull, and Mr. Ross. The instrumentalists were Mrs. and Miss Dougall. Mr. Hunter described, in a

very clear and excellent manner, the views and subjects as projected by Mr. Hendrie, and the whole enjoyable evening passed without a hitch. Among the large number of excellent slides may be mentioned those of Mr. Hendrie, landscape subjects; A. D. Guthries, collection of snap-shots of figures and landscape, attempts at moonlight effects, &c. R. C. Ewart had carefully grouped flower studies well rendered on the colour scheme. The Secretary's series was even better than his usually fine quality of work. Messrs. Davies, Smith, Dougall, and others completed the large and rather long series of pictures of all kinds of subjects. One thing must be said, that in the whole collection there was shown more artistic feeling and less really poor or bad work than are usually to be seen in so extensive a lot of exhibits.

Midland Camera Club.—March 2, Mr. R. J. Bailey in the chair.—Mr. T. H. Cox delivered a lecture on *Developers Old and New*, giving a short account of each developer, with the reasons for and against. It was claimed that the advantage of pyro lay in its power of giving density, and the readiness with which it can be controlled, the one great disadvantage being that with under-exposed plates the time taken to give detail is enormous. With hydroquinone it was urged that hard black and white negatives were obtained lacking half-tones. It was contended that softness could be produced by using potassium ferrocyanide with it in developing. Eikonogen gives detail readily, but lacks density-giving properties. For snap-shots a combined eikonogen and hydro-quinone developer was recommended. Great advantages were claimed for amidol as a universal developer, its only disadvantage being liability to fog with over-exposed plates. Arguments *pro* and *con.* with regard to metol and glycin were advanced.

FORTHCOMING EXHIBITIONS.

1894.

March ..... *Walker Art Gallery, Liverpool. Curator, C. Dyall.

,, 26–28 ..... *Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.

April 5–7 ..... *Aston Natural History and Photographic Society. Hon. Secretary, F. W. Pilditch, 133, Wills-street, Aston.

,, 13–28 ..... *Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

,, 16–28 ..... *New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

FOCUSSING SCREENS.

To the EDITOR.

SIR,—The focussing screens on most cameras, not to say all, are minus the four corners. This is simply to let the air out and in when drawing or pressing the bellows. It has occurred to me, and probably to you, and certainly to a great many amateurs, that when using lenses which are intended to cover just the plate in use, or even a larger one, and raising the front, the plate upon development shows a white spot on the upper corners of the picture. It puzzles some, and some will understand it readily, but no one has been able to see it before exposing the plate, just on account of the missing corners of the ground glass, which, had they been there, the defect would have been apparent at once.

I propose a little revolution in this matter, which will be, I think, a great improvement. If the manufacturers of cameras would leave the corners of the ground glass whole, and just leave a slit open in the centre of the glass of, say, a quarter of an inch, it would prove quite sufficient to let out any air, and have a very great advantage in the focussing, as when one focusses in that open space the very sharpest focussing is obtained, no matter how little light is admitted through the lens while photographing very dark interiors, where the centre of the picture is often a far corner dimly lighted. I do not suppose it will be something new to you if I say that films have some superiority over glass plates during development of the image. In case of an interior, and, in fact, any kind of picture where often one part needs more pushing than others, it is easy, after a rinse under the tap, to immerse into the developer just that part that needs it most, and push it until correct density to match the rest is obtained. The stiffness of a glass plate prevents this way of working up a part of a negative.—I am, yours, &c., A. LÉVY.

Asnières (Seine), February 28, 1894.

THE ACTION OF FORMIC ALDEHYDE ON GELATINE.

To the EDITOR.

SIR,—In your issue of February 2 you note the use of formalin, by foreign microscopists, for the purpose of rendering gelatine insoluble.

As the remarkable property of this substance is likely to be of great use in photography, I think it will be acceptable to your readers to have more definite information on the subject.

Formalin is simply the trade name of a 40 per cent. solution of formic aldehyde in water. Formic aldehyde is a gas at ordinary temperatures, but it is freely soluble in water; the chemical constitution is CH_2O, and is also known as methylic aldehyde, being obtainable from methylic alcohol, wood spirit, by oxidation.

To test the action of the solution of formic aldehyde on gelatine, I cut a small piece out of a sheet of Coignet's transparent gelatine and placed it in the solution for five minutes. Some solution was absorbed, and the gelatine became faintly opalescent and pliable, but it did not expand nor contract appreciably. However, it was no longer soluble in boiling water, also insoluble in solutions of caustic soda, caustic potash, cyanide of potassium, nitric acid, and hydrochloric acid.

When the formated gelatine is boiled with water, considerable lateral contraction takes place, that is, with a film unattached to a support; and I find, in this way, it is practicable to reduce an ordinary quarter-plate stripped film to lantern-plate size. The amount of contraction depends on the thickness of the film originally.

If the formated gelatine is not heated whilst moist, this contraction does not take place, and, although it is perfectly insoluble, yet it is capable of absorbing water.

It is not even necessary that the film to be treated should be immersed in the solution, for the moist vapour given off by the solution is capable of rendering insoluble a thin gelatine film, like that on P.O.P., in the space of half an hour.—I am, yours, &c., F. H. GLEW, *Chemist.*

156, *Clapham-road, S.W., February* 27, 1894.

LANTERN POLARISCOPES AND JETS.

To the EDITOR.

SIR,—Mr. G. R. Baker, in his "Lantern Mems.," published in THE LANTERN RECORD (supplement) of last week, mentions that "a scientific gentleman from the north suggests a modified arrangement of polariser for use in the lantern polariscope, by means of which the rays are twice reflected from the original horizontal plane, first, by means of a glass bundle, set at an angle of twenty-eight degrees facing downwards, and another parallel, to it facing upwards."

Now, if Mr. Baker is referring to me, or my new lantern polariscope and vertical attachment combined, which I described in his presence at the Central Club a few weeks ago, I must ask permission to correct a little error.

First of all, the novelty in the apparatus consists in combining a lantern polariscope with a vertical attachment in a very simple and inexpensive form, so arranged that from the same lantern we may have the ordinary direct projection, vertical projection, or the projection of polarised light, with almost instantaneous changes, and the credit for the arrangement is due to Dr. G. W. Sidebotham, of Hyde, who made one for himself, and then passed the whole idea on to me.

The top mirror is a plain mirror, not a glass bundle, as Mr. Baker states. When this is in position, face downwards, the polariscope is in use; if we remove the top mirror, everything is right for direct projection; by inserting the mirror in another socket, *face side up*, the vertical attachment is complete, and so all the changes can be performed by simply turning the top mirror or removing it altogether.

JETS.

I don't quite understand the intention of Mr. Baker in his last paragraph about mixed jets. Not long ago he was advocating mixed chambers of large size and of "peculiar" form, as supplied by the firm he represents; but, of course, as he was present at the Central Club when I gave the theory of mixed gas jets, and showed the utter uselessness of a mixing chamber of any kind, and that a mixing chamber never had anything to do with the good or bad working of a jet, there is no wonder he has changed his ideas. All that is wanted is a nozzle, smooth and taper inside, the length of which is three times its diameter. It is improved by counter-sinking the nozzle from the outside, and, as shown by my illustrations, we had better follow the construction of a fireman's hose-pipe nozzle.—I am, yours, &c., W. I. CHADWICK.

PHOTOGRAPHERS AND DEALERS.

To the EDITOR.

SIR,—At the Council meeting of the National Association of Professional Photographers, held at Birmingham on Thursday, February 8, Mr. Fall (the President) read a paper as to the photographer trading in photographic stores, and thus catering for the amateur, thereby doing himself some good by increasing his income, and also giving his friend the amateur a greater security in getting chemicals from quite as reliable a source as a local chemist or bookseller, whose knowledge of photographic requirements, to say the least, is not very deep.

I am aware the trade dealer would not look upon the project with any degree of favour; the harm done to him would be very small, and quite

counteracted by the photographer still remaining among the best customers, as there are very few who are not manufacturers of special articles, and these would find an increased sale by the multiplicity of agents, who could bring to the notice of the novices articles now scarcely coming under their observations.

I was immensely struck with the good and business-like ideas emanating from the paper of Mr. Fall, and would recommend all professionals to study this subject, and, by amalgamation, place themselves in competition with the said chemist, &c. They will never be able to do it otherwise, as I can testify to my cost, and, with all due deference to the manufacturers, consider their treatment to the professional unique, and know perfectly well they would rather make trade terms and give agencies with any other tradesmen, as in many towns they have done, after refusing the same to a photographer, giving to a chemist or stationer and printer.

I have every desire to see the amateur flourish, and during many years have formed a lasting friendship with gentlemen who do not practise the art for "sordid gain;" and have for a very long time given the use of a dark room to all comers, with occasional little help, and in every case must say have always found the amateur, whether friend or stranger, most ready to acknowledge any kindness (without payment), as one man should to another. Yet, when a few plates are required, it is impossible to supply him only at a loss, or selling to him at actual cost, else hand him over to the man who really knows nothing of the article he is selling, and he to make twenty per cent. profit.

I think there is scarcely in any branch of the British trading public this anomaly of the ordinary general public being traded with on the same terms as exists between the manufacturer and the photographer.

In looking over the numerous lists of plate-makers, by giving an order out of all proportion to one's requirements, as one does not believe that there is only one gocd plate-maker in the world, and would like at least two or three brands to choose from, one finds five per cent. offered on orders of 5*l.*; and this same generous soul will pack up and send by parcel post one dozen of his quarter-plates for fifteen penny stamps.

The days of good old monopoly are gone, the prices are—at least, on most photographers' lists—only too moderate, and we are brought face to face with the fact that, if we are compelled to sell in the cheapest market, we must also study economy in our purchasing, and, instead of being pushed out of the way, keep to our own by combination, and let the chemist and the bookseller sell their decoctions and books by all means; but manufacturers may find when too late that the professional has not been their worst enemy.—I am, yours, &c.,

March 3, 1894. THIRTY YEARS' PPOFESSIONAL.

"THE BENEVOLENT."—WHAT *IS* WANTED.

To the EDITOR.

SIR,—In reply to your paragraph *re* "The Photographers' Benevolent Association," I beg to set forth a few reasons why I think it is not better supported by the rank and file of the profession. In the first place, its very name is against it. For instance, take the word "benevolent." Now, "benevolent" is a very nice word with a very nice meaning in its right place, but, when applied to an association which should be a mutual benefit society, it seems and sounds out of place, and smacks too much of charity, alms-giving, and doles. Photographers, like the rest of mankind, do not care for charity if they can possibly do without it; but, on the other hand, if a really good mutual benefit society, with sick, death, and superannuation funds, to also include grants and loans at a small interest, to *bonâ fide* members in need, was organized and started, I feel sure that the photographers of the United Kingdom have sufficiently elementary notions of "self-help" and "thrift" to give it a hearty support. I suggest that a weekly or monthly subscription be paid by its members, after the manner of the many existing and flourishing trade and benefit societies. Such an organization as mentioned above could be started, with the present "Benevolent" as a base. This, I think, has already been suggested by Mr. Snowden Ward. That some such society is wanted amongst photographers is certain. But I am afraid that until the existing Association changes its name and present lines entirely, and until it is reorganized on a very much wider basis, it will fail to obtain the support of those who should support and whom it seeks to benefit.—I am, yours, &c., F. J. A.

March 3, 1894.

THE BEGINNING OF ART.

To the EDITOR.

SIR,—Will you kindly permit me to correct a statement which is attributed to me in the report of the "Central" in your last issue. It appears to me rather ridiculous to associate the beginning of photography with the beginning of art. My words on this point were as follows: "I am pleased to find that Mr. Wall associated the beginning of art in photography with the beginning of photography."—I am, yours, &c.,

London, March 5, 1894. J. S. TEAPE.

POSTPONEMENT OF MR. LAKE PRICE'S LECTURES.

To the EDITOR.

SIR,—I regret to say that Mr. Lake Price is seriously ill, and that therefore his lectures on *Art and Photography* must be postponed.

There will consequently be no extra Meeting on March 20, as has been announced, but the Ordinary and Technical Meetings will be held as usual.—I am, yours, &c., CHAPMAN JONES, *Hon. Sec.*

Photographic Society of Great Britain, 50, Great Russell-street, Bloomsbury, London, S.W., March 5, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange first-class background, by Seavey, Marion, &c., for others.—Address, W. P. MARSH, Royal Marina Studio, Bognor.

Will exchange embossing press, with four dies, by Marion, cost 5*l.* 5*s.*, for half-plate, wide-angle lens, by good maker.—Address, W. WALKER, Scotholme, Nottingham.

Will exchange Slingsby's *Practical Flashlight Photography* (Marion) for the *Art of Projection*, by an Expert (Hughes).—Address, PHILIP J. LEHMANN, Art Photographer, 22, New-street, Mold.

Quarter or half-plate camera or lens wanted, in exchange for double foolscap copying apparatus, cost 1*l.* 10*s.*, unused, and part cash, if necessary.—Address, F. HAMPSHIRE, 2, Upper Bainbrigge-street, Derby.

Wanted, to loan, about four negatives (half-plate size) of groups of school children; will lend, in exchange, a few quarter-plate and half-plate negatives of Yorkshire scenery, suitable for lantern slides, &c. Prints exchanged.—Address, H. KEELER, 158, Rochdale-road, Oldham.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. M. SKINNER.—Thanks.

PLATINUM.—See reply to "F. E. G."

PHOTO-MECHANIC.—You will find the instructions in our 1893 ALMANAC.

J. E. GUBBINS.—By all means employ a yellow screen, particularly with those frescoes with the blue ground.

HORACE S. PLIMSOLL.—The address of the Society for the Promotion of Photography is, we believe, Theobalds-road, W.C.

LIVERPUDLIAN.—So far as we are aware, nobody in this country undertakes the burning in of photographs on watch cases, &c.

LENS.—In all the lenses of that maker that we have seen, when any difference in diameter existed, the back combination was the larger.

SHARP AND HITCHMOUGH.—Our correspondents inform us that they have reduced the price of their plumb indicators from 1*s.* to 6*d.*

PROFESSIONAL.—Any watch-dial enameller will supply the small plaques to order. We do not know of any photographic dealer who stocks them.

RENWILL.—If you have tried all the remedies referred to, and the stain has resisted them all, we fear the negative is worthless. We can suggest nothing else.

A. H. PITCHER.—We have referred to our ALMANAC for 1888, the page indicated, and find no reference to any such apparatus as that about which you inquire.

CAERNEWAL.—We are not acquainted with the Bowman machine, and are sorry to be unable to give the desired information. Thanks for the print of Muckross Abbey.

WILTS.—If the local photographer only offered 1*s.* 6*d.* an ounce for your old stock of nitrate of silver, he certainly offered all it was worth, at the present price of the metal.

R. T. B.—Permission will have to be obtained to photograph within the Tower of London. We are not quite sure who is the proper person to apply to for permission to photograph the Crown Jewels, but probably the Lord Chamberlain.

LONDONENSIS.—There are two faults in the picture: one is that the camera was not held perfectly still when the exposure was made; the other, that the plate was out of focus. Supposing it had been free from these defects, it would have been a little over-exposed.

PHOTOPEN.—The information desired for converting an ordinary photographic print into a pen-and-ink line drawing, from which the photograph is afterwards dissolved away, was given in a series of two articles by Mr. A. J. Gough respectively in our issues of December 23, 1892, and January 6, 1893.

T. BEDWELL.—If the leather of the lithographic ink roller is hacked by the knife used for scraping off the ink, it will be useless for a beginner to attempt to use it for collotype work. However, the roller can be recovered, that is, new leather put upon it. Send it to any house that supplies lithographic material.

A. BOWLES.—In dealing with such a soft and over-exposed negative as the carbon print forwarded shows it to be, the tissue should be sensitised in a very weak solution, and the printing conducted in a very subdued light. Those who advised you to proceed in an opposite direction could have had no practical acquaintance with carbon printing.

C. WILSON.—You are quite right in your mathematics, for, strictly speaking, there is no such thing as depth of focus; but you are wrong in your deductions, for depth of definition is a fact, and one that is well recognised. We cannot now enter into the question, but merely inform you that this depth is dependent upon the diminution of the diaphragm.

B. says: "I should like to know, through your inquiry column, if there are any special oil colours for colouring photographs on opals to obtain transparency and avoid the brush effect?"—No special oil colours are sold for colouring opals. Much may, however, be gained by avoiding opaque colours as much as possible and using transparent ones.

NOVICE.—We should not advise you to make your own roller composition. It is a troublesome operation with small quantities, and the composition rarely turns out so good as that which can be purchased, while, if time be of value, it will cost more. The inking rollers, in all photo-mechanical work, are very important factors, particularly with a novice.

S. J. W.—Considering that the engraving is a very valuable one, and is already torn in several places, we should strongly advise you not to undertake its cleaning—that is, if you intend to do the work yourself. The formula you quote is as good as any, and with it an experienced workman will succeed, but an inexperienced hand might utterly ruin the picture.

SENEFELDER.—There is a process named "enameline," recently imported from America, which is claimed to be a simple, certain, and beautiful one for making half-tone process blocks on zinc or copper. We are not acquainted with the composition of the sensitive liquid, nor do we think it has ever been published, but information concerning it can be had by calling on, or writing to, Penrose & Co., 8A, Upper Baker-street, Clerkenwell, E.C.

EIKON writes: "I would feel obliged if you could give me your advice on the following query:—During the past two or three months my toning baths have almost refused to tone, though I have not changed the formula, which is as follows:—Acetate soda, ¾ ounce; water (boiling), 32 ounces. When cold, I add the gold, 10 grains. The gold I use is the ordinary 15-grain tube. I may mention, the last time I used the above bath it took me over two hours to tone about two dozen 10×8 and four dozen cabinets. Any information on the above will be esteemed a favour."—The trouble is, no doubt, due to the paper. Some papers, especially some of the highly albumenised ones, are very refractory in the toning bath. Try another sample of paper, obtained from a fresh source. The toning-solution formula is all right.

RUSSIA.—1. We are not aware of any scientific opinion on the matter. Hyposulphite of soda is so very cheap that people can be sufficiently lavish with it to ensure perfect fixation. We cannot say the smallest quantity that will suffice to fix any given number of prints without knowing the proportion of silver salts the prints contain. 2. The dark vignettes are produced by vignetting the negative in the camera, so that the margin prints black.

T. BORROWS.—The trouble has probably arisen from the gelatine film containing alum. Instead of using a dry plate coat plates for yourself, following the directions given in the ALMANAC. We fear you will have to spoil far more than ten plates before you become proficient in producing half-tone process blocks, unless you are much more fortunate than most people have been. However, you must not be disheartened by a few scores of failures.

F. E. G.—For working up carbon and bromide enlargements nothing more is used than the ordinary water colours as supplied by all artists' colourmen. Wake's book will give the necessary information, but it is out of print. However, you might succeed in obtaining a copy through an advertisement in the columns devoted to such purposes. There is no means now of equalising the density of the negative, but much may be accomplished by shading the thinner portion in the printing.

A. M. Z.—1. We have known of a solution of pyro similarly preserved keeping for a couple of years. 2. It would be impossible to get so much carbonate and sulphite of soda into that quantity of water. Refer to the tables of solubilities in the ALMANAC for 1894, pages 964–6. Kindly write your figures a little plainer on the next occasion. We can give no explanation concerning the relative covering powers of the Goerz and Zeiss objectives, our acquaintance with them being, like your own, a catalogue one.

R. RADCLIFFE WHITEHEAD.—1. You have misread the passage in the book; read it again carefully, and you will see that it does not refer to such a reducer as you name. 2. We have not known of harm occurring to negatives after treatment with methylated spirit. 3. There are, we believe, several such, but for obvious reasons we cannot particularise. The point is regarded by makers as a "secret." 4. Practically there is no advantage. Mercurial intensification may be conducted in ordinary daylight, the double chloride not being sensitive to light.

PHILIP KING says: "I have a galvanised tank, made by a local ironmonger, as a storage supply of water for washing my sensitive plates. I observe a thin white film to adhere to its sides and bottom, and, notwithstanding continual scrubbing and washing, am unable to get rid of it. It has occurred to me that a coat or two of paint would prevent this. Would you kindly inform me whether the paint would act in any way deleterious to the sensitive plate?"—We should say, let the white film, which is doubtless oxide of zinc, remain; it will do no harm. Paint, especially when fresh, might give rise to trouble.

KISTRE writes: "I am a draper's assistant by trade, and have for the last five years taken up photography as a hobby—in fact, the last two years, having got on so well and successful, I have been making it a remunerative employment for spare time. Having got to a fair pitch, and liking it much better than I do the drapery, I should very much like to take it up professionally. Would you advise me to do so; and, if so, how to make a start, having no capital to speak of? Could I borrow the money to start me in a small business, at a small percentage, and who would be the best people to borrow same of?"—If you are in the exceptionally lucky position of finding photography more remunerative than your usual occupation, we should say, By all means take to it professionally. As to the financial part of your question, we cannot undertake to advise. Consult some capitalist in your neighbourhood.

S. NICHOLL (Valais, Switzerland) writes as follows: "I fail to get good tones with ready-sensitised paper, using the borax bath, never mind what the negatives are, strong or weak. They look well enough before putting into the fixing bath, but after they come out they are a nasty muddy brown, and the loss of colour in the fixing bath is greater than I ever remember, though I have used the same formulæ for more than twenty-five years. Do you think it can be caused by the water, which is *very* strongly impregnated with lime? Would any other toning formulæ be more suitable to such water, or is it likely to be caused by bad hyposulphite of soda, which I get from a large photographic dealer at Geneva? I always preferred the borax toning bath, on account of the rich purple tones I always got."—We have no doubt that the prints are over-toned. Some samples of ready-sensitised paper will not bear toning beyond the red-brown stage without behaving as our correspondent describes. We do not think the water is at fault, and also doubt if the hyposulphite is.

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REPRODUCED NEGATIVES AND THEIR CHARACTERISTICS.

At the present time very extensive use has to be made of reproduced negatives, particularly in connexion with some of the photo-mechanical processes, and the question frequently arises as to whether a reproduction can be made equal to the original. By this time every one, of course, knows pretty well that, when the original is of inferior quality, a reproduction of it may frequently be made that is infinitely its superior in every respect, except, perhaps, in the matter of actual sharpness. Supposing, however, that the original is the very acme of perfection for any particular purpose, will a negative made from it possess the same qualities, or, rather, will it possess the same characteristics? That is the point for consideration.

We may here say at once that we have never yet seen a reproduced negative that an expert would fail to recognise as such, although, if a print from it only had been shown, the case would often be different. There is a peculiar something about a reproduced negative which it is impossible to describe, and which stamps it as being a copy in the eyes of an experienced worker, and this brings us to the point. Have negatives which have been made from others the same characteristics as those from which they have been duplicated? We here ignore the term quality—that is, excellence, or otherwise, of the work—as that is quite distinct from what may be termed the character of the image.

It is now well known that the ultimate result by any printing process—mechanical or otherwise—is largely dependent on the character of the negative, apart from its quality; and just now there is a plurality of processes in vogue, all of which require special types of negatives in order to work them to the best advantage. As an example, the rich, deep, velvety black prints that used to be obtained on albumen paper with the vigorous collodion negatives of old are an impossibility from the thin and delicate gelatine ones now taken. On the other hand, if those old negatives, once considered the height of perfection, were used with the new gelatine papers now in the market, the prints would be little short of hideous. Again, in most of the mechanical processes, negatives of the wet-collodion type are imperative. Indeed, with some of them it is absolutely impossible to get the best results unless wet-collodion negatives are employed.

Seeing the important part that the character of the negative plays in the various printing methods, and the undoubted fact that the negative which may be the best for one process is the very reverse for another, it becomes a point for consideration whether the original character of a negative is retained in a reproduction from it. If the negative be a dry-plate one, and it be reproduced by contact printing on dry plates, the reproduction will be of the same general character as the original, although its quality may be better or worse, as the case may be. But if the original be a wet-plate one, and it be duplicated in the same way with dry plates, the new negative will be of an altogether different type from the original. It will partake of the dry-plate character, and be next to worthless for processes in which the primary negative would have been perfection.

In the majority of cases where a new negative has to be made it becomes a question of camera work. Usually a reversal of the picture, as regards right and left, is necessary, or it has to be made of a different size. With camera exposures there is a greater scope for getting a variety of results than, perhaps, with contact printing, but still they are very limited. In working in this way from a gelatine negative and using dry plates, it will be found that the result will be very similar to that obtained by the contact method. Such will also be the case when the original is a collodion negative, if it be duplicated on a dry plate. If a carbon transparency were employed instead of a dry-plate one, the result would not be materially different—it would still have the dry-plate character. Supposing, however, the original negative were on a dry plate and the reproduction were made on a wet-collodion one, would it be of the true wet-plate character, and serve its purpose in those processes where the quality is imperative as well as if it had been taken in the first instance on a wet plate? Some might surmise that it would, but in actual practice it is found not to be so. Although the new negative may be better for its purpose than the original, it still possesses much of the dry-plate character, however skilfully it may have been produced. If, however, when the primary negative is a wet-collodion one, the reproduction is also made by the same process, the latter will possess all the well-known characteristics of the former, and will be quite as well adapted for its purpose as is the original—that is, so far as the general type of image is concerned.

From the above it will be seen that, to retain the characteristics of a dry-plate negative in a reproduction of it, the new negative must be made on a dry plate, as collodion will not answer so well; while, on the other hand, to preserve in a reproduction of a wet-plate negative its particular character, the wet-collodion process must be employed, as gelatine is quite incapable of rendering it. In a word, when it is essential to secure in a reproduced negative the same actual character of image as that of the original, the same process must be employed as that by which it was taken, as no other is capable of rendering it.

THE COLLODION PROCESS.

XIV.—Dry-collodion Plates.

The convenience of employing a perfectly dry collodionised surface instead of a wet, or even a moist one, was, nearly from Archer's discovery, well recognised; but the conditions under which to ensure sensitiveness with a dried film were not at first known. It was well understood that, if the plate were dried without removing the silver nitrate, this latter would crystallise and disintegrate the film, while, if washed previous to drying, a greatly prolonged exposure would be requisite. We, however, are well aware of very beautiful ivory-like positives having been obtained on plates which had been washed and dried, and exposed only a little longer than if still wet, but with which the precaution had been taken of reimmersion in the silver bath previous to development with iron.

It is to Dr. Hill Norris, of Birmingham, we are indebted for first laying down the conditions under which plates could be made to keep for a protracted period, and his discovery has influenced the preparation of dry-collodion plates ever afterwards. Compressed in a few words, the conditions are, that, after removing the free nitrate by washing the plate while the film is yet in an open, pappy condition, and before it is allowed to dry and become horny, it should be immersed in a hot solution of gelatine, or that of a substance possessing like properties, *e.g.*, gum. This fills up the pores of the collodion, and ensures it setting in such a manner as to be subsequently penetrable by the developer after the film has been softened by immersion in water. An application of this nature causes not only permeability of the film by the developer, but organifies it, and deposits a protecting varnish on the surface, which prevents it from so readily getting damaged by abrasion as would otherwise be the case.

The principles of preservatives having been enunciated, numerous other substances, capable of acting in a similar manner, were from time to time suggested. It would be impracticable, in an article of this nature, to name them all, or describe their peculiarities of action, hence we will confine ourselves to a few which, from the certainty and excellence of the results obtained, caused them to become universal favourites.

A solution of tannin poured over and allowed to soak into a well-washed collodion film, and afterwards dried, gives a plate which keeps well before exposure, and yields a vigorous printing negative; but, if the development be delayed many days after exposure, the latent image will be found to have materially faded away. Hence, to ensure the best results being obtained, it is necessary to effect the development within one or two days after exposure. Infusions of tea and coffee were preferred by some to tannin, and strong advocates could readily be found for either. Dry plates, possessing a degree of sensitiveness equalling some of the gelatine plates now on the market, may be made by means of a collodion salted with eight grains of bromide of cadmium, and excited in a silver bath not less than sixty grains to the ounce. It takes from five to eight minutes to sensitise. The free nitrate is then removed by washing, after which the tannin, or similar preservative, is applied, it also being removed by washing. The image must be developed by alkaline pyro.

It is found that, if the organifier be composed of a mixture of gum with tannin, and this rendered slightly alkaline with ammonia, a still greater degree of sensitiveness is obtained. We warn any one who thinks of trying a strong purely bromised collodion not to make the attempt with an ordinary thirty-grain silver bath; for, upon immersing a plate in the silver solution, the silver bromide will be formed on the surface, and it will fall from off the plate in flakes, whereas it will not do so if the silver bath is richer in silver.

We are aware that many readers and experimentalists have a hankering after dry-collodion plates for certain purposes, and we here take occasion to inform them that, when employing gum as a preservative, this being known to give an exalted degree of sensitiveness, their efforts will not be crowned with that success they desire unless they make sure that the gum solution is not acid, but slightly alkaline. A preservative of this nature, which may be in excellent condition to-day, will, if tested two or three days hence, be found not to be alkaline, but acid, for it develops acidity with considerable rapidity, and this impairs the sensitiveness of the plates prepared by its means.

Albumen, when rightly employed, makes a good preservative for collodion plates for which a high degree of sensitiveness is not required. It behaves in a somewhat anomalous manner. If applied to a plate that has been washed on removal from the bath, and allowed to dry after the application, the plate will be lamentably lacking in sensitiveness; but, if the washing be so imperfectly performed as to allow some silver to be present in the film, and the albumen (the white of one egg beaten up with ten to fifteen ounces of water, with a few drops of ammonia to make it keep) be then applied, and, after a minute or so, well washed off with dashes of water, then will the plate be sensitive, keep well, and yield negatives of surpassing beauty.

But by far the best way of employing albumen as a preservative of collodionised plates is one that was discovered by a North London medical practitioner, Dr. Ryley, who, when experimenting with a view of ascertaining the effect of coagulation of the albumen employed as a preservative, found that hot water answered better than any chemical coagulator. After this discovery we rarely used any other means for preparing plates, except when engaged in experimental work. We will describe the routine of preparing, say, a dozen plates.

A plate is coated with ordinary negative collodion, sensitised in a thirty-five grain silver bath, and laid face up in a dish of water. A second plate is then collodionised, and placed in the silver bath. The first one is now removed from the water bath, and subjected to a spray of water from the tap; it has then a small quantity of the diluted albumen described above poured over it, and made to flow to each corner; this is important. The albumen is then dripped off at one corner, and a little fresh solution applied. Meantime a flat tin dish containing water has been quietly kept boiling on a stand over a Bunsen gas burner, and into this the collodionised plate, with its liquid albumen coating, is thrown, face up. The plate will not break; at any rate, we have thus treated numerous 10 × 8 plates, and never broken one; but the albumen is coagulated almost by the first contact with the water. After remaining for about four or five seconds, the plate is deftly hooked up out of the hot water, and placed on a rack to dry, which, being hot, it does in less than a quarter of a minute. The plate, now in the silver bath, is transferred to the water, and a third one coated and made to take its place. In this way the operations are dovetailed into each other, and the operator will be surprised at finding how quickly he has got to the last one. It only now remains to pack the plates into a grooved plate box, or transfer them at once to the dark slides.

We have in the previous paragraph hinted the importance

of causing the albumen to flow all over the surface. The importance of doing so will be apparent from the following experiment:—When applying the albumen avoid allowing it to flow over any definitely selected portion—a corner or a margin—of the plate, and then proceed as usual with the coagulation by the hot water. Upon subsequently developing the image a black stain will mark the portion to which the albumen was prevented having access.

There is an inexpressible charm in negatives obtained on these plates. There is transparency in the blacks, purity in the lights, and fine gradation throughout. When used for stereoscopic transparencies, they quite rival albumen ones, and, owing to the collodion film being protected by a layer of coagulated albumen, they do not readily scratch.

WASHING NEGATIVES AND PRINTS WITHOUT A CONSTANT WATER SUPPLY.

We presume that a very large number of our readers are not so fortunately placed as to be able to command the most perfect arrangements for washing either negatives or prints, but on the contrary are compelled to manage as best they can on the principle of "frequent changes" rather than a "constant stream" of water. Three week ago, in an article on "Irregularities in Intensification," the inefficiency of the former system, unless very thoroughly carried out, was alluded to, and since that time we have received several communications on the subject from correspondents who are perforce compelled to work on that principle. A few words on the subject may, therefore, not be out of place.

The question affects two distinct classes of operators: namely, those who having a supply of water direct from the main are unable to utilise it to advantage through their inability to devote a room specially to photographic purposes, and those dwellers in the smaller provincial towns or villages where no mains exist, and where the whole supply is from the pump, each class being, we have reason to know, a pretty numerous one.

Each class may be subdivided intc subsections, varying in the degrees of inconvenience experienced, but the town dweller is, undoubtedly, better placed than his country congener, inasmuch as he can at any rate invade the domestic portion of the house after the work of the day is done, and utilise the night hours for washing purposes, where either a "constant supply" exists or a storage cistern of moderate dimensions. Not so where the supply of the then really "precious fluid" comes from the pump, and has to be raised as required, for unless a force-pump is on the premises no store of water can be kept, and, even in the latter case, it is seldom that the cistern it supplies is of sufficient capacity to allow of its being drawn upon for several hours without refilling.

If a storage cistern is available, however, its dimensions need not be great if the arrangements are carefully devised, for a very gradual flow of water will suffice for all purposes if properly applied. What is necessary is the avoidance of stagnation in the lower strata of the washing tank or vessel, and this condition is easily fulfilled by means of an exit pipe, however small, drawing its supply from the bottom of the vessel, the inflow of fresh water being adjusted so as to be a very little slower than the outflow. If this be properly arranged, a supply of from thirty to fifty gallons of water may be made to serve almost any purpose, because the soluble hyposulphites to be removed are constantly being drained away as they sink to the bottom, and the supernatant fluid, being thus in a state of regular replacement, remains always in an equally efficient state to dissolve out the salts. When the system of periodical changes is followed, unless the changes are made at rapid intervals, a point is reached at which the salts remaining in the film and those in solution are at a practical equilibrium, and all useful action ceases; hence it is obvious that much of the time expended in washing is absolutely wasted.

There are, of course, a great number of devices, more or less "automatic" in their nature, for washing both negatives and prints, but these, almost without exception, require a "head" of water for their successful working—in other words, a supply from the main or from a store cistern. Where neither of these exists, the first thing is to supply some sort of store vessel, and fortunately this is neither a difficult nor an expensive matter. The only other care is to find an outlet for the waste water, and, where the circumstances are such that this cannot be arranged indoors, it is generally easy to find a corner outside where it can be managed.

Galvanised iron tanks of the capacity mentioned can be obtained nowadays for a few shillings, and, while they form the most perfect vessels for the purpose, will last for many years. A cheaper substitute will be found in an old paraffin cask, which may be obtained for from half-a-crown to three shillings and sixpence; but this will of course require to be cleaned and purified to fit it for its new purpose. If only recently emptied, the head should be carefully removed, and the interior freely exposed to the atmosphere, and, if possible, to sunshine, until it appears tolerably dry. It should then be charred inside by burning quantities of dry straw or paper in it till the surface of the wood seems free from the objectionable oil; but in carrying out this operation it will be advisable to have one or two wet sacks at hand to cover over the opening, in case the paraffin it still contains should inflame. After this treatment it should be very carefully brushed out with a stiff brush, and two or three coats of Brunswick black applied to the interior, and allowed to harden for a few days. It is then ready for use, a pipe or tap of some sort being first inserted two or three inches from the bottom.

In order to render it an efficient storage cistern, it must, of course, be so placed that its lower portion is elevated above the level upon which the washing apparatus is to be used—for working purposes the higher the better, but a foot or eighteen inches will suffice if a greater height cannot be conveniently allowed. In most instances, the lower the elevation the easier will it be to fill, and, if the height be only a few feet from the ground, the filling can be performed with an ordinary bucket or can. Where, however, the height or inaccessibility of position prevents this, some simple form of force-pump will be necessary, and nothing better presents itself for this purpose than one of the numerous garden engines or syringes constructed to deliver a continuous stream of water. These can be obtained at all prices, a perfectly efficient one for this purpose, constructed of zinc, being obtainable from most dealers in garden requisites for the modest sum of half-a-crown, and capable of discharging a jet of water to a distance of from twenty-five to forty feet. This, of course, is temporarily connected with the store tank by means of a length of garden hose; or, better still, a length of thin "compo" pipe can be permanently attached to the cistern, and the force-pump connected with that when required, the latter being worked from a vessel of water on the ground level.

We are, of course, writing for the benefit of those who are

compelled to resort to somewhat makeshift measures, and it must not be presumed that the method we are describing is free from a certain amount of labour. Still, those of our readers who amuse themselves in horticultural pursuits will be well aware how comparatively rapidly a thirty-gallon tank can be emptied (and, therefore, equally filled) by means of such an appliance as described. That small amount of labour being performed, the means are supplied of washing negatives or prints for several hours by the continuous-change system, instead of by simply soaking.

The form of the washing machine proper is immaterial, provided it conforms to the conditions already laid down, namely, that the water charged with dissolved salts is drawn off at the bottom, and that the outflow runs at the same rate or a little faster than the inflow. Of course, in time, if any great difference between the two rates existed, the vessel would be emptied; but, unless the adjustment is very carelessly performed, that is not likely to occur. On the other hand, under reverse conditions, the vessel would overflow, which is the more likely contingency, unless its capacity is much greater than the quantity of water used to commence with.

To avoid either fault, and to greatly facilitate the adjustment of the inflow and exit, the latter tube may be bent up the side of the vessel, and then again at a right angle, at a distance of, say, an inch from its top, so as to deliver the waste at that height, in which case its diameter or capacity is quite immaterial, provided it is larger than the inflow—the larger, indeed, the better, as it then simply acts as an overflow at that point, being thrown out of work at once if, by any accident, the supply from the store cistern should cease. If it be necessary to carry the waste to a distance from the washing machine, the overflow pipe should discharge itself into one of wider capacity, into which it fits loosely, and not with an air-tight connexion; otherwise it will act as a syphon, which is inadvisable, unless it be desired to empty and refill the tank at stated intervals.

If such be the object, the outlet tube, instead of being bent at a right angle, should take the form of a syphon, the longer leg reaching below the level of the bottom of the tank; or an indiarubber tube may be connected with the rectangular bend of the tube first mentioned, and one end allowed to dip below the bottom level, when the same apparatus will serve the dual purpose of continuous washing or intermittent changing.

A plain zinc or wooden tank may be used to serve the purpose of either negatives or prints, but, when required for prints, it will be advisable, in order to prevent their sticking together, settling to the bottom, and probably choking the exit pipe, to provide a number of frames of zinc or iron wire, enamelled or coated with Brunswick black, and fitting loosely into the tank, with a small space of, say, half an inch between them. These are converted into trays by stretching strings across them at right angles, and about an inch apart, upon which the prints lie in single layers, and, while getting the benefit of all the water that passes through the apparatus, they are unable to adhere together.

Celestial Photography made Popular.—It is worthy of note, as indicating the hold which photography in connexion with astronomical pursuits has taken of the public mind, that the entirely unscientific periodical *Good Words* contains an illustrated article on "Celestial Photography" in the current issue.

Pinhole Photography.—One of the difficulties of pinhole photography is the obtaining an even circular aperture in the foil or other material employed. This difficulty should, however, no longer be felt when a method of obtaining a "pinhole" perfectly circular and the $\frac{1}{5000}$ of an inch in diameter is described. Professor Boys has done this at a meeting of the Physical Society, his plan being to solder round a quartz fibre passing through a hole in a metal plate, and then drawing out the fibre.

Iodine as a Base-forming Element.—It is probable that the views held by chemists regarding the position and action of iodine may shortly undergo a profound modification. Professor Victor Meyer and Dr. Hartmann have contributed an important memoir to the *Bericht* of the German Chemical Society, describing the preparation of a new substance containing iodine as the central, predominating, or group-forming element, which is a powerful *base*, combining with acids to form well-defined salts with elimination of water precisely as when a caustic alkali is neutralised by an acid. A description is given of the chloride, bromide, iodide, nitrate, and sulphate of this new base.

A Weather Prophecy for 1894.—In a very interesting paper by Mr. G. J. Symons on "Rainfall Records in the British Isles," there occurs a description of a singular coincidence or rule. Ever since the year 1812, every year ending in the figure 4 had less than the average rainfall, with the exception that every twelfth year, reckoning from 1860, has had more than the average rain. According to this, the year 1894 should be a dry one. It is to be hoped, however, that whatever the weather, London may not experience such a torrential downpour as happened on July 23, 1878. It is very unusual for an inch of rain to fall in twenty-four hours, but on the date in question no less than three and a quarter inches fell in one hour and a half!

Dark Structures in the Heavens.—One of the most ingenious explanations of eclipses by the well-known paradoxical lecturer, "Parallax," was that in the heavens were invisible dark bodies which intervened and prevented the sun's or planets' light reaching the earth. It is easy to see where the fallacy comes in, but, besides that, many doubt altogether the existence of any dark body in any part of the heavens; but Mr. Ranyard, in an article on the "Structure of the Milky Way" in this month's *Knowledge*, says that if there are readers still sceptical as to the actual existence of dark structures in the Milky Way, they will find ample evidence to convince them of the existence of narrow streams and branching tree-like structures of semi-opaque material by examining an enlargement of the central portion of the remarkable photograph of the region of the Milky Way near Alpha Cephei, this enlargement being given as a plate in the periodical in question.

Proffer of Matrimony to Secure a Sitting.—We have read of many awkward and embarrassing predicaments the would-be portrait-taker has been led into; but an experience of Mr. Henry Lansdell, as narrated in his recent work, *Chinese Central Asia*, is, perhaps, the drollest ever seriously recounted. Turning his steps towards Khotan, one of the oldest cities of Central Asia, but very rarely visited on account of its remoteness from the main track between Yarkand and Kashmir, he was very anxious to add to his ethnological series a specimen of Khotan female loveliness. But it was contrary to Khotan law and custom for women to have their portraits taken. The native agent, however, suggested an easy way out of the difficulty. Let Mr. Lansdell inform the landlord of the *serai* that he wanted a pretty wife, and wished him to send up four or five on approbation—"and then," said the agent, "as soon as they come you can take their portraits." A differently worded invitation was sent, without bringing a wife or sitter. We are told that when at Bokhara, where he had previously stayed, the natives had become

ccustomed to the Kodak that an objection to his using it was ly made. The authorities, however, did protest against his ing a view of the wretched overcrowded prison.

The 1896 Solar Eclipse.—The Eclipse Committee of the tish Astronomical Association are taking steps to ascertain the bable atmospheric and climatic conditions of the north coast of rway in August; but meanwhile Mr. A. C. D. Crommelin and s C. Crommelin have written a paper on the eclipse, and it was d at the meeting held the last day of February. The paper con- ied a provisional programme for travelling to and working at the posed station near Vadso, on the Varanger Fjord in Finmark, and m this, and from the discussion that followed, it would seem by means unlikely that the trip will become a popular one. All vellers in Norway speak of the hospitality of the Norwegians l the low charges made for accommodation, at any rate, in the frequented parts—and Vadso lies out of the usual track of the rist; and one of the added attractions of this neighbourhood, ording to a lieutenant quoted by Mr. Maunder, is the fact that one fortunate enough to travel round the coast to Nova Zembla l find it a very paradise for sportsmen. Reindeer were numerous, d fowl of every description plentiful, and the streams were full of d fish—the festive and playful mosquito being the only drawback. en, again, the writers suggest that, by starting on the trip a day two earlier, the voyagers would be able to get a glimpse of the dnight sun, August 2 being the latest day it would be visible en from the top of North Cape.

PHOTO-MECHANICAL NOTES.

E tyro in process work is afflicted with something of a craze just w for "copper etching." It appears to be thought that copper is a t of philospher's stone to conjure with in process work, but old rkers know well enough that there is nothing novel in the use of pper for photo-etching. They merely use it because, for some pro- sses, it is more adaptable than zinc. Results only very slightly, if all, inferior can be obtained on the latter metal, and the cost of it is s than a quarter. It is, therefore, with some amount of reluctance at commercial houses take to copper, because in these times stomers will pay nothing extra for their blocks, and prices are too w already to admit of any increase in cost of production. A square ot of copper of average gauge will cost about 7*s.* 6*d.*, whilst a uare foot of zinc of the same thickness and finish only costs 1*s.* 8*d.* e price, therefore, if nothing else, will be a preventive to the tended use of the metal. Moreover, perchloride of iron, which is nerally used for copper etching, is a much more costly mordant an nitric acid, and, for the production of the very best results, quires more skilful treatment.

Like most things presumed to be new, copper etching is in reality ry old. Both Niépce and Fox Talbot made copper etchings by ethods little different to the processes in use to-day. The former oduced his prints in bitumen; the latter in bichromated gelatine. practice it is considered, however, that a bitumen print cannot be itably etched with perchloride of iron, which is liable to attack the cture if the etching is at all energetic. The albumen bichromate ocess is also unsuitable for copper, for, by itself, the albumen will ot adhere, and it is little better if inked up previous to development. he tendency of the albumen image to dissolve away may, to a rtain extent, be arrested by using an alcoholic solution of per- loride, but even then the results are not perfect nor easily attained; or can any rolling up by the lithographic method be accomplished, or copper has not those absorbent qualities which zinc possesses. Ve are therefore reduced to Fox Talbot's idea of utilising gelatine, hich resists the action of perchloride of iron, especially when nsitised with a bichromate and acted on by light. Fox Talbot pread a thin coating of bichromated gelatine on a highly polished opper plate, and exposed it under a positive, afterwards immersing in perchloride of iron solution, which was rocked over the surface f the plate. The iron solution gradually dissolved away the gela- ine in the less exposed parts, and then attacked the copper, oughening the latter, and so forming a grain. The action of the on solution was proportionate to the solubility of the various parts of the picture, the highest lights being attacked last, and therefore least of all. There were practical difficulties in the printing of such plates after the etching had been completed, and a great deal of hand tooling was necessary to make them render a decent proof.

Talbot's idea was, however, the parent of Klic's process of photogravure. Klic was a very clever artist, and an ardent experimenter, but an indifferent business man. Whilst his process remained a secret he had splendid opportunities. Almost unlimited capital was placed at his disposal, and he had fitted up a magnificent studio and works in Barnsbury Park for working the process. The money flowed out, but not the work, and the end soon came. The secret leaked out, and now any one may dabble in photogravure, and the majority have forgotten, or perhaps have never heard, the name of the man who first made it practicable.

Klic deposited a grain of asphalt on the plate first, and, instead of spreading bichromated gelatine on top of that, he took advantage of carbon tissue, transferring a negative image to the copper. The perchloride etched through the carbon image exactly as it did through Fox Talbot's plain gelatine, but the asphalt underneath gave the grain or tooth necessary to hold the ink, and so secured perfect printing qualities. Dujardin, of Paris, still prefers, however, to use Fox Talbot's method of flowing on a gelatine-bichromate solution. He uses his grain indifferently, either under or over the gelatine film. In the latter case, he, of course, deposits it when the film is dry, either before or after exposure.

The utilisation of the asphalt grain for relief, as well as intaglio, etching has often been tried; but, as I explained in some of my previous notes, the letterpress printer bars the way by either declining to print such blocks, or making a mess of them if he does. Besides, the public have not been educated up to admiration for a natural grain. As in silver printing, they like gloss and smoothness of effect. For relief blocks, therefore, the screen must be interposed in taking the negative. The polished copper plate is coated with gelatine bichromate, as in Fox Talbot's process, or a carbon transfer is put down, as in Klic's process, minus the asphalt grain. A difference, however, is that, whereas Fox Talbot and Klic relied on the perchloride solution slowly dissolving the gelatine, the relief etcher develops away the unaltered gelatine first, and then etches the copper laid bare. The perchloride will not attack the gelatine before a considerable depth is attained.

A peculiar feature of perchloride of iron etching is that the more dilute the solution is within limits, the more vigorous is its action in etching. Thus a saturated solution will hardly etch the plate at all, but, if two parts of saturated solution are taken, and one part of water added, the etching will proceed, and will go more vigorously if more water is added. In practice it is best to make a saturated solution and then dilute to various strengths, tested by Beaumé's hydrometer. Five solutions are generally made up, ranging from 48° to 30°, and the etching is generally timed with a watch, which, by the way, had better be placed under a glass cover, or the splashes of perchloride will ruin its case. The solutions work best at a temperature of 60° to 70° Fahr. The action can be stopped sufficiently by rinsing under the tap. No brushing is admissible, the film being somewhat tender. The perchloride solutions are kept for future use, and it is found that old solutions work better than when newly made up. If sufficient depth has not been attained, when the gelatine resist has been cleaned off, the plate may be rolled with a glazed leather roller and hard etching ink, and the etching again proceeded with.

I may conclude my notes on copper etching by mentioning that attempts have been made to provide a substitute for copper, by depositing a copper facing on zinc; but, plausible as it seems in theory, there is no advantage in practice, and the slight saving of expense is not compensated for. If a thick deposit is made on the zinc, it is liable to peel off when heat is applied to the plate. A thick deposit is necessary, or the perchloride soon goes through the copper facing, and will then not attack the zinc. Despite the fact that old workers have tried copper-faced zinc long ago, an enterprising German has recently taken out a patent in this country for such plates, and confidingly believes in the ægis of our Patent Office.

WM. GAMBLE.

JOTTINGS.

IN the name of the Prophet—Poetry! Hidden away among the "Answers to Correspondents" on March 2nd, is an acrostic on the word "Photographs." It is in blank verse. Now, I am not a poet. I was once—that is, before I was married—but since my wife, when-

ever we have one of those argumentative interviews punctuated by an appeal to the convincing force of the flat-iron, began to fling the amorous effusions I bestowed upon her before our marriage in my teeth (or the few that are left of them), I have conceived the deepest dislike to the divine afflatus and those poor noodles possessed of it. Mr. Grinfield, the author of the acrostic in question, calls a photograph "Heav'n's pure reflection of man's face and mien." Humph! Heaven is held responsible for a great many curious things, but this is the first time I have seen it charged with "reflecting"—and "purely," too—the human face. If Mr. Grinfield is right, all I can say is, that Heaven is generally a very indifferent portrait photographer, and would be all the better for a few lessons in posing, lighting, exposure, development, printing, and restrained retouching. The author also attributes to "perfect photograms" the interesting property of "solacing the heart with beams of light and love." Fancy, a dozen *cartes-de-visite* for five shillings, with "beams of light and love thrown in!" But—oh!—ah! I forgot. It's only poetry!

"An Ex-countryman" (on p. 143) writes to say that for six years he has exhibited outside his premises in suburban London enlargements of various kinds, but during the whole of that time has not had a single inquiry for them from the public, and has had solely to depend on small work. He is in doubt about the reason for this state of things. Not knowing what his enlargements are like, it would be impertinent of me to attempt to tell him the reason; but I have less scruple in giving a general answer. The secret of the matter is, I think, laid bare in your "American Note" of last week headed "Show-case Iniquities." Photographers, as a rule, are culpably careless as to the condition of their specimens, both photographically and economically. As to the matter of enlargement specimens, it appears to me that the profession, as a whole, takes no note of the constant improvement going on in public taste, and also ignores the fact that nowadays most educated people know pretty well what a good or artistic picture is or should be; hence what would have passed muster ten or twenty years ago is now looked at with contempt or aversion. Speaking from a knowledge of middle-class photographers' specimens of enlargements exhibited in most large towns, I do not hesitate to say that, as a rule, they are hideous compounds of soot and whitewash or abortions of colour, the negation throughout of artistic taste, and such as the crudest amateur would be ashamed of. Can it be wondered, therefore, that the public passes them by? Where good work is shown, I fear it is frequently not appreciated by reason of the prejudice created by the bad; for we all know that unfavourable impressions are easily made and difficult to displace.

"A thirty years professional" ventilates, in your last issue, a grievance which is by no means new, and, furthermore, is far from being confined to photography. The sum and substance of his complaint is, that the ranks of photographic dealers are entered by chemists, booksellers, and the like, and that the professional photographer, being a consumer, is unable to compete with the dealers in supplying amateurs and others. His remedy for this state of affairs is combination and co-operation amongst professionals. It is a pretty theory on paper, but it will never work out in practice. Your average photographer is unfortunately the incarnation of apathy and helplessness. Why, I know not, but the fact remains. Only the other day an appeal was sent to all the photographers of the Kingdom to the number of about 4000, asking them to join, free of expense, the Photographers' Copyright Union, a matter in which each one of them is vitally interested. How many have responded? Considerably under a thousand, I believe. Cohesion, unless actuated by atomic attraction, is an impossibility. Regarding the antagonism between photographers and the trade as to discounts, how are the manufacturers to know, if they gave a photographer trade discounts, that the goods would be sold and not used in the ordinary way of professional work? To my mind, this apiration of the photographer to be both dealer and photographer could not be generally realised. It would be a case of attempting to hunt with the hounds and run with the hare. The cobbler should stick to his las fancy the manufacturers could give more cogent reasons than for not placing photographers on the same terms as dealers.

"Kistre" (see page 160) is a draper's assistant who is tired o yard measure, and contemplates taking up photography, whic has been making a remunerative hobby in his spare time, as a fession. He asks the Editor, among other "staggerers," to tell of whom he can borrow the capital to start him in a small busi "Kistre," you dear, sweet, innocent, unsophisticated counter-jun there is a bond of sympathy between us. Shake hands. For not I—nay, have not many of us—long followed photography hobby, and should we not be delighted if some nice, benevolent gentleman would come along and show us the way to the na haunt of that auriferous but evasive fowl popularly known as 'oof bird, in order that we might start in business ("on our ow Yea, verily! "Kistre," dear boy, I am afraid you'll have to stic the "Step-this-way-madam" profession, if you build your hope becoming a photographer on some philanthropic capitalist advan you money simply on the security of a hobby. The drapery t may be profitless enough, but in photography just now it would case of "You dun'no where you are."

Mr. Alfred Watkins is to be complimented upon the novelty not the utility, of the principle which he subjects to exposition the paper on *A Method and Instrument for Timing Developme* read before the Central Photographic Club. The discovery that w correct exposure, and, if I may employ the term to express a comm meaning commonly understood, normal alkaline-pyro developme the time of appearance of, say, the half-tones of the negative ha definite proportion to the time necessary for the development of negative up to printing opacity, is useful and interesting informat so far as it goes, but I cannot help thinking that its chances of e becoming of any real practical value are rather remote. The pr ple casts too much responsibility upon that somewhat inaccur instrument of precision, the human eye—a state of things fr which it is, of course, impossible to escape. Thus the appearanc the image in its earliest, as, indeed, in all its stages of developme must vary with the optical peculiarities of the individual; wh when we reflect that the colourific and other physical properties different brands of sensitive preparations, and the illumination of developing room (two points not touched on by Mr. Watkins), a tend to influence the perceptive judgment of the operator, we easily see that the term, "the time of *appearance* of the image not without the elements of complexity, and is only with diffic reducible to the condition of a factor in calculation. I am s that Mr. Watkins could not tell us how the principle worked with rodinal, metol, amidol, and glycin. My experience with first three, which, however, has not been great, is that in many ca development amounts to a total inversion of the usual order, that with pyro-soda, pyro-ammonia, and ferrous oxalate. But, as I h already hinted, it strikes me that the fatal "personal equation the most formidable obstacle which the principle will have to s mount.

I am not an appreciator of what are known as out-of-focus effe but for the benefit of those who like their photographs with th characteristics, I will put my finger on a little bit of advice given Mr. C. F. Robinson, in the course of his paper on *Rough Papers*, prin on page 84. This gentleman, whose mission it is to cater for those, w aim at breadth of effect, says in substance: Don't take your negative of focus, but impart the required diffused treatment by means of rough printing surface. Some day when fuzzymania has shared fate of other epidemics and been stamped out, many of those w "shake the camera" when making their exposures may be sorry th did so. A sharp negative may possibly have some commercial val an unsharp one none.

COSMO

BOUND FOR JAPAN.

II.

ER a pleasant run from Penang, we arrived duly at Singapore, which find, in the early morning, delightfully cool and pleasant. We take first ride in a Jinrickshas, or "rickshaws," as they are properly called e, through the native town to the European settlement, passing ough crowds of representatives of every Asiatic nation.

The statuesque Sikh policemen contrast strongly with the active little lays, who, it appears, are kept well in order by their stalwart guardians turbans and uniforms of Rharkee. I naturally was able to secure ne very picturesque groups there.

I notice great quantities of mangosteins, a tropical fruit apparently uliar to Singapore and the neighbourhood. I also notice some very e platinotypes at the principal photographers, in the European quarter, l a large chemist's store near by exhibits a good stock of photographic uisites.

Taking a neat little carriage called a "gharry," we then drive to the tanical Gardens, where the display of tropical vegetation is said to unequalled in any part of the world, for here we are only sixty miles m the Equator. At one o'clock in the day the heat is intense, and t I long for a 12×10 camera, for the number of obtainable pictures pears endless, whichever way one turns.

On our way back from the gardens we look in at the Stamford Raffles useum, and notice, amongst many interesting exhibits, a wonderful collecn of butterflies, some of enormous size, and all most brilliantly coloured. ien we turn into Emerson's, and have a luxurious tiffin; after that to e Fruit Market, where we buy green oranges, parmeloes, grapes, and angosteins, after a great deal of very amusing bargaining. The camera , of course, brought into requisition many times, the twenty-four films rried in it being far too few for a day ashore in Singapore.

Going back to the ship, we pass a cluster of houses built on piles sunk the water, which, we are told, are the only ones to be seen out of Siam nd Burmah.

Boatloads of gorgeous shells are brought alongside the ship, and ffered for sale; they are brought up from the bottom of the sea by ivers, who ply their vocation around the neigbouring islands. After ie usual diving for coppers and nickels by the Malay boys, we sail from ingapore with regret, bound north, for Hong Kong.

Several Chinese ladies are now on board, who do not leave their cabins roughout the voyage; there is also a most attractive little Chinese baby, hom I propitiate by offering gifts of fruit, which it receives with a markable stoicism; it is travelling in charge of its father (in this part f the globe the fathers seem to take most responsibility with the babies), ho is excessively delighted when I proceed to photograph the baby.

On our approach to Hong Kong, we notice signs of what turns out fterwards to have been a severe typhoon. The lighthouse, forty miles utside of Hong Kong, has had its share, for the lantern has been mashed, and all the oil and fresh water lost, and they signal to our essel to convey to Hong Kong tidings of their miserable plight. We lso pass dismantled steamers and sailing vessels, making the best of heir way into the harbour, all evidently having had a very bad time; n the harbour itself, communication between the ships and the quays ad been stopped for two entire days.

The harbour of Hong Kong is a magnificent picture, either by day or ight; steam launches and sampans are rushing about in all directions; he studies of life afloat are numerous, many of the sampans plying etween the shore and the ships are managed by women, and in several ases one can observe that the sampan is the only home for sometimes a large family, the covered part in which passengers sit being used for cooking the family repasts by day, and as a place of rest at night, and also for religious functions. On engaging a sampan the night before I leave Hong Kong to go on board my steamer, I sit down in the covered-in part, and find myself surrounded by the expiring remnants of joss sticks. A comely-looking Chinawoman, with large silver bangles on her wrist, steers the boat, besides keeping her eye on the baby, who lies in the bottom of the boat fast asleep, the other members of the crew, consisting of a very old woman, a girl of twelve, and a boy of about sixteen, who manages the sails. I must own that I breathe a little more freely when I find myself safely on the deck of my steamer. On shore the studies of humanity are endless; the camera has a subject for its action every two or three yards, and, judging by the way its operations are watched, hand cameras are not plentiful in Hong Kong.

There are some fine displays of photographs and photographic material in the handsome stores along the Queen's-road, but I am told that in this trying climate there is great trouble in the keeping of all kinds of photographic printing paper.

The view from shipboard at night is very charming, tier upon tier of gas and electric lights from the houses surrounding the harbour, and on the heights above, and the countless number of boats carrying lights darting about in all directions, combine to make a most fairylike scene, and one not to be forgotten speedily.

Through the rapidity with which we have carried the mails from Europe, we find that we are eight days too early for our proper steamer for Japan, and therefore arrange to proceed thither by the American mail steamer, the *City of Pekin*, a handsome and commodious vessel, in which we are made extremely comfortable; but, unfortunately, before we have left Hong Kong many hours, we enter into the influence of a typhoon, which causes us to cast anchor for twenty hours outside the island of Formosa—a very anxious time for our fine old skipper, who cannot be persuaded to leave the bows of the ship for his needful rest, but anxiously watches the heavy strain on the two gigantic chain cables, steam being always kept up ready in case of either of the cables dragging, for the big waves are rushing past the ship at a fearful pace. A poor dismasted junk seems to fly past our vessel; we can see no signs of life on board her. All this time, owing to the strength of the cables and the good hold of our anchors, our ship is as steady as if moored to a quay in harbour.

I find some of the officers of this American steamer are greatly interested in photography, and out here on the China Sea we discuss many questions, ranging from Traill Taylor on *Optics* down to the powder process, and back again to Zeiss lenses and the tele-photo of Dallmeyer. Of course my "daisy" of a camera (as they call it) is overhauled, and all its points discussed.

The weather moderating, we start afresh, and in due time anchor in the harbour of Nagasaki in a drenching storm of rain, thus getting our first ideas of Japan under rather depressing circumstances. Here we take in a supply of coal, and it is wonderfully interesting to watch these funny little people—men, women, and children—and the way they have of putting the coal on board. They pack themselves up a sloping gangway from the coal lighter to the ship, and the little baskets of coal, containing, perhaps, ten or twelve pounds' weight, are passed onwards, or, rather, jerked, from hand to hand till the bunkers are reached, any quantity of laughter and fun going on amongst themselves all the time. It is said to be the quickest method of coaling in the world. We land here for a few hours, and find that photography is hardly such a lucrative profession in Japan as it is at home, for we have a large choice of 12×10 photographs offered to us for what is equal to sixpence each, some of them very artistically coloured.

We are shown the small island of Deshima, where the Dutch (the first people to settle in Japan for trading purposes) were located; they were only allowed on the mainland very rarely, and then only with a strong guard.

Nagasaki looks very pretty from the water, the houses overlooking the harbour peeping out from amongst the foliage here and there, all up the sides of the hills which encircle the harbour. High up amongst the trees is pointed out to us the scene of Pierre Loti's amusing romance of Japanese life, *Madame Chrysanthemame*. After leaving Nagasaki, we pass through the Straits of Simonoseki, and enter the world-famed inland sea of Japan; but, alas! very soon the rain commences again, and we are able to see nothing of its vaunted beauties. We see grim shadows through the mist, which we are told are beautiful islands; the weather becomes worse and worse, till at last it blows such a hurricane of wind and rain that for safety we have to anchor again. After thirty-six hours' stoppage the weather clears up, and we start again, passing through a number of islands covered with trees growing down to the water's edge, and we arrive at Kobé.

It is Sunday, and when we land we find that, with the exception of the European places of business, all the people are plying their usual vocations, and buying and selling just as on any other day in the week. We stroll up through the town to the railway station, noticing that the waiting-room there was well supplied with files of newspapers printed both in English and in the native character. We also visit a Shinto temple, in the enclosed grounds of which large numbers of booths, for the sale of all conceivable articles, are pitched. Kobé is fast becoming a place of great importance as a shipping port; one of the residents tells me that it will soon outstrip Yokohama in that respect.

In Kobé Harbour the fishermen have a curious custom of striking wooden clappers, or sounding a gong, while their nets are out. We are told they do so with the object of attracting the fish from the depths.

After about twenty-four hours' pleasant steaming, we find ourselves safely landed at Yokohama; but here a difficulty comes in, my camera and films are pounced upon by the customs authorities, and, it being after office hours, I am compelled to leave them in their charge till next morning, when, on presenting myself to redeem them, an officer proceeds to value the apparatus. The camera he pronounces to be a Kodak, and asks for one dollar duty, and my packages of films have to bear a charge of half a dollar. I need scarcely say that I pay the charges with great alacrity, having expected to have been mulcted in at least twenty times that amount. But is it not time that such a stupid duty was abolished in present-day, go-ahead Japan?

R. P. Drage.

BRIXTON AND CLAPHAM CAMERA CLUB EXHIBITION.

The fourth Exhibition of this excellent and progressive Society was held during last week at the Clarence Rooms, 376, Coldharbour-lane, a capital suite for exhibition purposes. The display, which, as usual, was confind to members, was tastefully arranged, and comprised about 170 photographs, rather more than 100 lantern slides, and a small section in which the pictures that were medalled at previous Exhibitions were shown. We were pleased to observe that not only did the Exhibition, as a whole,

indicate a distinct improvement upon its predecessor, but that the efforts of several individual members evinced a degree of technical and artistic merit unreservedly entitling them to places in the very front rank of modern workers. Of Messrs. W. Thomas, F. Goldby, F. W. Levett, Dockree, Harmer, and Grant the Brixton and Clapham Club may be honestly proud. The Judges on this occasion were Mr. Gale and Mr. Warnerke, and the following were their awards:—

Class A (Prints and Enlargements).—Silver medal for best collective exhibit, W. Thomas. Siver medal for best individual exhibit, W. E. Harman. Bronze medal, 1st, F. Goldby; 2nd, W. Thomas. Honourable mention, 1st, E. Dockree; 2nd, R. G. F. Kidson; 3rd, F. F. Buckle; 4th, F. W. Levett.

Class B (Lantern Slides).—Silver medal, E. Dockree. Bronze medal, W. E. Harman. Honourable mention, T. Buck, F. W. Grant. Microscopic, E. Dockree.

Mr. F. W. Kent's *Back from the Fishing Ground*, a large and careful study of fishing craft, was the first to attract attention, and Mr. W. E. Harman's view, *On the Bure*, was a pleasing wherry piece. Mr. Fenn Kidson showed several good efforts, and deserved honourable mention for an effective winter scene, in bromide, of *Friar's-lane, Bury St. Edmunds*. Mr. H. F. Hoole's *Child Blowing Bubbles*, Mr. Pinder's *Albert Memorial* bits, and Mrs. Walker's views and figure studies merited notice. Mr. Dockree had several capital architectural subjects, of Canterbury and elsewhere, and also showed some artistic winter landscape studies. In addition to numerous examples of his skill in small work, river and pastoral, Mr. W. Thomas had entered several larger frames, chiefly of landscape subjects, in which it struck us this clever worker was striking out a new line, some of them being landscapes, admirable in composition and very softly rendered. Mr. Thomas well deserved his award. Mr. Levett's views, printed in carbon, were very charming, and the same gentleman also had some river scenes admirably rendered in bromide. Notable sky and sea studies, together with other meritorious examples, came from Mr. F. W. Grant, and, though Mr. Harman was well represented, we could not help thinking the Judges took a lenient view of his *Haymaking* (silver medal for best individual exhibit), a mezzotype rendering of a familiar subject, in which, however, the deeper shadows were altogether too heavy and uniform. Other contributors of striking work were Messrs. Bartrop (a large view of *Skiddaw from Keswick*), C. F. Archer (a refined example of classic portraiture, *Galatea*), Whillard (old people having a *Gossip*), the President (Dr. Reynolds), F. T. Buckle, &c. Perhaps the most strikingly successful exhibitor was Mr. F. Goldby, who sent numerous exquisite small platinum and other studies in and about Cambridge, Switzerland, Iceland, and some larger ones, all very fine. In artistic feeling and sound technique Mr. Golding may be congratulated upon having achieved very high honours. Mr. Buck, Mr. Pinder, Mr. Grant, Mr. Dockree, and other gentlemen contributed to the class for slides, and the last-named gentleman's photo-micrographic slides of popular objects were exceedingly good. It is worthy of note that only one albumen silver print was hung. The Club has our best congratulations on the success of its Exhibition, as a result of which eleven new members joined last week. We also heard that the ladies' section had a membership of ten.

In a room adjoining the main hall the apparatus section was placed, large and varied collections being shown by Mr. Montague Atkinson, of 88, Brixton-hill, S.W.; the Prosser Roberts' Company, of Church-street, Camberwell, S.E.; and Mr. Parke, of the Electric-avenue, Brixton. The European Blair Camera Company also had an exhibit of their well-known hand cameras, and in particular those of their 1894 make.

LORD RAYLEIGH ON IRIDESCENCE.

Lord Rayleigh's lecture at the Royal Institution on Saturday afternoon was devoted to an explanation of the beautiful iridescent effects observable in thin transparent films of matter, the best instance of which is obtained in the soap bubble. Newton worked very hard on this problem, as will be admitted by those acquainted with his second book of the *Optics*, but no satisfactory explanation of the phenomena was forthcoming until Dr. Young took the matter in hand in the early part of this century, and used it as a final and triumphant proof of the correctness of the wave theory of light. It was shown conclusively that in the case of light reflected from thin transparent films the phenomena of "wave interference" take place, and that to these phenomena are due the varying coloured rays which proceed from such surfaces. To produce the natural effect of white light upon the eye, the various mixed waves of which it consists—red, blue, green, or yellow, according as the wave length is longer or shorter—must reach the eye in a particular order. This is the order in which they do reach our eye when nothing intervenes to retard the motion of either one, or some, or all of them. If, however, something intervenes which throws them "out of step," one with the other, then all manner of trouble ensues. It is obvious that under such circumstances the crest of one wave might get mixed up in the trough of another, and so produce levelness, which in the case of light waves means, of course, no effect or blackness. In most instances only some of the waves are thus neutralised, leaving the rest to reach the winning post alone. Thus, if the interference neutralised the red, the green, and yellow waves, only the blue would remain, and so present themselves to the eye.

Lord Rayleigh, by means of diagrams, explained how it happens that thin films have this property of throwing the waves of white light into confusion, and causing them to interfere with each other. The well-known experiment of "Newton's rings" was repeated. Here is practically a film of air of varying thickness imprisoned between two glass surfaces, one plane and the other curved. The result is the production of a series of rainbow-tinted concentric rings, which, when measured and tested on mathematical principles, are found to perfectly confirm the theory of wave interference. The most striking proof, however, is afforded by using monochromatic light, that is, light consisting of only one length of wave only, say the yellow wave. Here any interference must produce absolute blackness, since there are no waves of other colours to proceed to the eye. Lord Rayleigh produced a beautiful photograph of Newton's rings obtained from a sodium flame, showing an indefinite succession of black and yellow rings, very sharply defined. Photographers, by the way, will be interested to learn that Lord Rayleigh made his ordinary dry plate sensitive to yellow light by immersion in cyanine. From this point Lord Rayleigh proceeded to show how the principle of "Newton's rings" is used by opticians for testing the truth of the surfaces of their lenses. When such a surface is placed in contact with a true standard surface, the most minute variations in the thickness of the film of air between are detected by the irregular appearance of the "rings"—in fact, the rings may be regarded as analogous to the "contour lines," which are used on maps to indicate the heights of mountains or elevated surfaces. It is, however, very difficult to get anything like a perfectly true standard surface to test with. Lord Rayleigh a year or so back pointed out how Nature's own "surface plate"—perfectly still water—can be applied to meet the difficulty. The surface to be tested is immersed face upwards in the water, leaving only a film of about the sixteenth of an inch overlying it. If thinner films than this are used, strange to say, the water takes a long time to settle down level, showing a tendency at first to remain "humped up" in patches. "How about the curvature of the earth?" will probably be asked by those who understand what is really implied in the statement that water maintains its level. Lord Rayleigh answers this question by pointing out that earth curvature is not optically perceptible in a pan of water of less than four feet diameter.

As a reward for following him through the knotty theories of wave interference, the lecturer treated his audience to an example or two of what may be called the spectacular effects as observed best in the case of a soap bubble. Here we get, of course, a beautiful play of colour, changing every moment as the fluid film varies its thickness in patches and streams with every breath of air. A soap film was put in the lantern, and a powerful electric beam projected through it to display the gorgeous colouring, which it is difficult to believe is not the result of real pigments. Brewster's favourite experiment of causing the colours to career about in endless vortex motion by the application of a stream of air was introduced. It was pointed out that in a soap film the tendency is for the film to be thinnest at the top and thickest at the bottom, and the richest colouring—blues and plum colours—correspond to the thicker parts of the film. The average thickness of such films is found by calculation not to exceed one-millionth of a centimetre. Some permanent films of varnish obtained by flotation on the surface of water were also shown as exceedingly beautiful masses of colour.

THE LATE MR. JOHN MOFFAT, EDINBURGH.

We have the sorrowful task of having to chronicle the passing away, in his seventy-fifth year, of Mr. John Moffat, photographer, of Edinburgh, who but lately vacated the office of President of the Edinburgh Photographic Society. He felt its duties, more especially those of the evening meetings, too much for his failing strength. He was one of that body's early members, and before its inauguration he was member of the earlier Photographic Society of Scotland.

An engraver by profession, he was also a competent crayon and chalk portraitist, and at the advent of the Daguerreotype process naturally set himself to the reading up and studying the new art that was then taking the world by storm. It was not, however, till the publication of the collodion process in 1850 that he resolutely set himself to master the practice of it. The first essay resulted in the discovery, after going through the various forms of posing the sitter, focussing, exposing the plate the necessary number of seconds, as per book of instructions, and development, that he had neglected to iodise the collodion, there being neither image nor trace of it upon the plate!

At the time he began to study the subject there were few, if any,

annals to be had, and to get his knowledge he had to potter through a French one (most probably Le Gray's) with a very dim remembrance of his very boyish acquirements in that language. Born in Aberdeen, he had therefore a double gift of determination to succeed, and he mastered the practice of the art as an amateur so thoroughly that he felt justified in forsaking his profession and leaving the seaside town (which was then but a village) of Portobello, and he opened a portrait studio in Nicolson-square, Edinburgh, in 1853. A few years after he moved to the east end of Princes-street, and moving as business did further west and more westward, till the firm—for it is now the firm of Moffat & Son—occupies the most commanding, if not also the largest, studios in the city.

Consequent upon artistic taste, knowledge, and acquirements, his work has all along kept at a high level of quality, indeed his plain-paper portraits of thirty years ago are not easily surpassed now, and it may also be noted that a faded print of that era and kind is a rarity. The late Edinburgh International Exhibition showed that the work was still up to the highest modern standards, and as a consequence the large number of *employés* has rather augmented than diminished, in face of the continued cry of dull and failing business, and prices keep still at the highest level.

As showing that he was always about the first with the use of any new thing, although not pretending to be an inventor himself, it may be mentioned that he, assisted by the editor of this JOURNAL and our Edinburgh correspondent, took, at one of the meetings of the Society, a portrait of Sir David Brewster, which was certainly the first publicly taken in Edinburgh by the use of the light of burning magnesium wire. In the earlier part of Mr. Moffat's career, all who practised with the portrait lenses then in use were much troubled by the want of coincidence of the visual and the actinic foci of their lenses, and he believed that he discovered the method of correcting this by putting the focussing glass and sensitive plate on different planes, or at different distances from the lens, and thus making both foci equally sharp; but, of course, this idea was also hit upon by many of the active brains of the busy experimenters of the period, *e.g.*, Claudet and others.

He was ever kind and considerate to his *employés* and generous in his treatment of them, while, in ordinary business matters, all knew him to be honourable and upright in the highest degree.

THE LATE MR. THOMAS PRINGLE.

In addition to and within a few days of Mr. Moffat's death, another of the older professional photographers of Edinburgh, Mr. Thomas Pringle, has also passed away. He was bred an engraver, and, like several others, drifted into photography soon after completing his apprenticeship. For some time assistant in the firm of Ross & Thomson, the well-known photographers to the Queen, on the retirement of Mr. Thomson he became partner with Mr. Ross, and they carried on business for many years as Ross & Pringle, till that firm was dissolved by Mr. Ross retiring. Mr. Pringle carried on the business for a considerable time thereafter, but it did not seem to prosper as formerly, and after a retirement for some years he commenced business recently in a newly-built studio, in which he has not had the chance of again trying for success, as he unfortunately succumbed to a sudden attack of heart disease at the age of sixty-two.

PHOTOGRAPHIC CHEMICALS: HOW TO PREPARE THEM, AND HOW TO TEST THEIR PURITY.

[South London Photographic Society.]

To the photographer who may be far away from home, or even to the resident in out-of-the-way places, to know how to make what they cannot possibly procure, must be of deep interest, and all must find it instructive to be able to test their purchased chemicals for impurities, and perhaps obtain a clue to the cause of some unexpected failure. In the examination or testing of substances, it is found that each material may be recognised by certain chemical properties, which are as distinct as the signs or appearances commonly used for recognising bodies; thus, ordinary water is generally known to us as being clear, transparent liquid, without odour or colour, and having little or no taste, and the chemist can recognise water by compelling it to dissolve certain salts, and by separating from it the two gases, oxygen and hydrogen. Again, common salt is popularly known as a white substance in larger or smaller crystals, and which has a salt taste; whilst the chemist can more certainly recognise it by the addition of testing solutions, which give indications with common salt, and which they yield with no other material. The apparatus necessary for such operations need not be expensive. A dozen test tubes, a test-tube stand, a few flasks, and a few reagents will suffice for our purpose. A few solutions of barium nitrate, calcium chloride, hydrochloric acid, nitrate of silver, ferric chloride, sulphuric acid, sulphuretted hydrogen, and one or two others, will be abundant for the purpose.

The chemicals we commonly use are sodium sulphite, sodium carbonate, acetate of sodium, silver nitrate, ammonium and potassium bromide, ammonium hydrate, ammonium sulphocyanide, gold chloride, potassium oxalate, iron sulphate, &c. We will take for our first salt sodium carbonate, otherwise called washing soda, soda salts. It is prepared commercially by four or five processes, but we will explain two here. Common salt, chloride of sodium, is strongly heated in a special furnace with sulphuric acid, when hydrochloric acid gas is liberated, and sulphate of sodium is left as a residue; this is decomposed by being intensely heated, mixed with small coal and limestone; this forms a black substance known as black ash. Various chemical changes take place, the carbonate of lime is converted into an oxide; the sodium sulphate is converted into sodium sulphide; this is finally converted into sodium carbonate by the action of the limestone. The mass is treated with hot water and allowed to settle, and the clear liquid is evaporated down, the crude carbonate of sodium crystallises out; to purify this, it is mixed with sawdust, and the whole again strongly heated, when on further treatment with water, soda crystals, commonly called washing soda, are obtained. Soda crystals prepared by the above process may contain sulphates, chlorides, and other impurities. Tests: sodium salts moistened with HCl and heated on a platinum wire in a Bunsen flame give an intense yellow colour, which is not seen through blue glass. Solutions containing sodium give with potassium antimoniate a white precipitate. To test for sulphates, make a solution in water, add a few drops of HNO_3, then add some solution of barium nitrate; if sulphates are present a white precipitate will be thrown down.

For chlorides, which are obtained from the limestone, add to a fresh portion of the solution acidified with HNO_3 a solution of silver nitrate, when a curdy white precipitate will be given if chlorides are present.

A solution of pure carbonate of sodium should give a white precipitate with lead nitrate; if a brown or black precipitate is formed, it proves the presence of sodium sulphite. Sometimes bicarbonate of sodium is substituted by mistake for carbonate; this can be easily detected by the fact that a cold solution of bicarbonate does not give a precipitate with a solution of Epsom salts, whereas a cold solution of carbonate would give an immediate white precipitate.

The other process for making Na_2CO_3, which can be easily carried out by any amateur, is as follows:—A saturated solution of bicarbonate of ammonium is mixed with a saturated solution of chloride of sodium, common salt. Bicarbonate of soda is precipitated, and this on ignition leaves carbonate of soda of the purest quality.

R. H. RICHARDS.

(To be continued.)

News and Notes.

THE business of Messrs. Thévoz & Co., of Geneva, will in future be conducted under the style and title of the Société Anonyme des Arts Graphiques. Messrs. F. Thévoz and Chauffat, of the old firm, remain directors.

CHARLES LETTS'S PHOTOGRAPHER'S DIARY FOR 1894.—This useful diary, edited by Hector Maclean, F.G.S., contains Notes on Novelties in Photography, formulæ, reference tables, lists of Societies, postal, and other information. The diary portion contains four days on the page, and it is interleaved with blotting-paper.

PHOTOGRAPHY AND DIVORCE.—Here is a passage from the evidence of a lady who recently brought a petition for divorce against her husband:—"I went to his house, got into the bedroom, and there I broke open his despatch box. I found fifteen letters which Miss Jackson had sent to him. *The same evening I had photographs taken of them.* I returned the originals by registered letter the same evening."

WE recently had to express our disappointment at the failure to hold an Exhibition at the usual triennial period this year at Liverpool, but a whisper has reached us that if we were to prophesy such a joining of hands next year, between the Liverpool Amateur Society and the Corporation officials of that city, as would result in the projecting of an Exhibition on a hitherto unequalled scale, our anticipation might not be inaccurate.

THE NORTHERN PHOTOGRAPHIC AND SCIENTIFIC ASSOCIATION.—This Society had a Ladies' Evening on Thursday last week, their hall, Canning-crescent, Wood Green, N., being crowded. The entertainment consisted of a concert, conducted by Mr. Plant Coldrey, and an exhibition of lantern slides, including one made from a negative taken by artificial light of the whole company present by Mr. W. T. Goodhew, the whole of the operations being conducted in a very brief space of time.

THE Annual Musical and Lantern Entertainment (Ladies' Night) of the London and Provincial Photographic Association was held at St. George's Hall, Aldersgate-street, on Thursday, March 8. There was a good attendance, in which the fair sex predominated, and Mr. Traill Taylor presided. To the musical part of the programme Miss Teape, Mrs. Atkins, Miss Taylor, Mr. T. H. Smith, Mr. Fenton-Jones, Mr. Lorimer, Mr. Welford, Mr. Dicker, and others contributed. Mr. Bedding recited, and a selection of slides by Messrs. E. H. Bayston, L. Medland, T. E. Freshwater, Cembrano, Teape, and Welford was shown.

"EDISON'S" (?) "LATEST."—Mr. Edison has, says Reuter's correspondent at New York, perfected his kinetoscope for the continuous photography of objects in motion, and has exhibited it at a small party. The main principle of the invention consists in taking a great number of impressions by means of a camera in a very limited space of time, thus obtaining a continuous photograph of the entire motion of the object or the person selected. The photographs follow each other in such rapid succession that no lapse of time can be detected between the impressions recorded, and the series of pictures becomes in effect but one picture. The subject chosen for the first photograph by the new (*sic*) process was the well-known strong man, Sandow.

THE POLYTECHNIC NORWAY TRIPS.—Mr. S. J. Beckett writes: "It will, I feel sure, interest a number of your readers to know of the yachting tours the Polytechnic are arranging for the coming season. I enclose you prospectus, and I think you will agree with me that the itinerary embraces all the best and most characteristic of the scenery in Norway, which possesses a fame it is needless for me to expatiate upon. As a field for picture-making and for health's sake no more profitable jaunt could be taken. The Polytechnic have arranged to fit up a dark room for the use of photographers on board, and plates, developers, &c., can be obtained from me on board. As I shall accompany the cruises as official photographer, I shall be glad to give intending travellers any hints or advice relative to photography in that delightful country. Another point of importance is that the whole tour works out less than three farthings per mile, and the *inclusive* cost of the whole cruise (including drives, extra excursions, and any possible extras, &c.) need not exceed 12*l.* 12*s.*" Full particulars of the Norway Cruises may be obtained of Mr. R. Mitchell, secretary of the Polytechnic, 309, Regent-street, W.

DRY PLATES FOR PROCESS WORK.—"We venture to prophecy" (says *Process Work*)—"though it is never safe, we are told, to prophecy unless you know—that before long gelatine dry plates will almost, if not entirely, supersede wet collodion for half-tone work. We have good reason for saying this from our own experience and through knowing what some practical workers are doing in this way. The fact is, it has been so persistently dinned into our ears by old collodion workers that 'dry plates are no good for process work,' that few people have cared to make the experiment of using them, and those who have most probably did so in a half-hearted way, and failed to get good results. Now, the remarkable thing is that no one, comparatively speaking, troubles to try dry plates for half-tone work. As a rule the experiments were made on line subjects, on the assumption, we suppose, that if they were good enough for line they would likewise be good for half-tone. Thus the experiments never reached the half-tone stage. Yet, singularly enough, it has been found that even a common landscape plate will give a very fair half-tone result with careful development, whilst a lantern or a photo-mechanical plate will give all that can be desired. We warn our readers, however, that they cannot expect to rush off, buy a packet of dry plates, and get right away the results they hoped for. It will need patient trial, especially on the part of those who are mostly accustomed to wet-plate work. The latter will have to forget all they know of collodion work before they can succeed with dry plates, the conditions are so different. The average amateur will succeed far better with dry plates, because he has become accustomed to all the little dodges of manipulation, and will take infinitely more care than the average process operator. We have, in fact, been surprised to note the excellence of half-tone negatives made on dry plates by tyros in process work, as evidenced by results brought in for our inspection. This being so, it is high time that process firms should go into the merits of dry-plate work; but, if they do so, it will be utterly useless to attempt to do it in the midst of wet-plate work. They must set apart a dark room, a camera, and all the appliances for the purpose, and charge an intelligent young operator with the duty of making the trial with an incentive to success. We may add this much, that the use of dry plates for half-tone work is not in the nature of an experiment. They are being practically used daily by at least two important firms, and by many smaller workers."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No 4602.—"An Improvement in Photographic Cameras." E. C. HAWKINS.—*Dated March*, 1894.

No. 4606.—"Improvements in the Manufacture of Sensitive Plates and Films for Photographic Purposes." C. E. PETTITT.—*Dated March*, 1894.

No. 4627.—"Improvements in or relating to Appliances for the Manufacture of Photographic Films." T. H. BLAIR and THE EUROPEAN BLAIR CAMERA COMPANY, LIMITED.—*Dated March*, 1894.

No. 4777.—"Improvements in Iris Diaphragms, for Photographic or other purposes." Complete specification. T. MORTON and J. A. SPRASON.—*Dated March*, 1894.

No. 4781.—"A New or Improved Photographic Camera Bag and Changing Bag combined." C. THOMPSON.—*Dated March*, 1894.

No. 4689.—"Improvements in the Preparation, Packing, and Storing of Photographic Chemical Compounds." J. R. C. GALE and J. W. T. CADETT.—*Dated March*, 1894.

No. 4866.—"Improvements in Changing Boxes or Backs for Photographic Cameras." A. RIDDELL and J. SINCLAIR.—*Dated March*, 1894.

No. 4887.—"Improvements in Iris Diaphragms." A. S. NEWMAN and J. GUARDIA.—*Dated March*, 1894.

No. 5013.—"An Improved Portable Tilting Head or Table for Photographic Camera Stands and other similar purposes." T. TARLETON.—*Dated March*, 1893.

No. 5061.—"Improvements in or appertaining to Photographs." S. H. A. OAKES and R. R. GIBBS.—*Dated March*, 1894.

PATENTS COMPLETED.

IMPROVED SILVER HALOID EMULSION FOR PHOTOGRAPHIC PURPOSES.

No. 5517. WILLIAM HENRY PRESTWICH, 744, High-road, Tottenham. *February* 10, 1894.

MY invention relates to sensitive silver emulsions for coating glass, films, or paper for photographic purposes, my improved emulsion in the case of negatives preventing what is known as solarisation and halation, which characterise negatives taken on plates coated with emulsion made in the ordinary way from gelatine only of subjects photographed in strong contrast; in the case of transparencies imparting a ground-glass effect, and, in the case of prints on paper or opal glass, producing a matt surface.

These results I obtain by using, in conjunction with gelatine, a proportion of an amylaceous substance, such as starch, arrowroot, corn, or rice flower.

In carrying out my invention, I prepare a solution in water of gelatine and starch, or its analogues, this mixture or solution being used in the emulsification of the silver haloid in the usual manner. In practice I find that the desired matt surface is obtained by using three parts of gelatine to one part of the particular starch selected, but these proportions may be varied. To prevent precipitation of the starch, it is advisable, after softening the gelatine and starch in water, to raise the temperature to from 130° to 160° Fahr., this boiling or cooking causing a certain amount of swelling of the starch granules, and thus rendering them less liable to be precipitated than before cooking in the gelatine solution, but care must be taken not to heat the mixture sufficiently to burst the starch granules.

As an example of a chloride emulsion for printing out, or for development, I give the following, which I have found to give good results:—

Water	20 ounces.
Starch	200 grains.
Gelatine	600 ,,
Citric acid	50 ,,
Recrystallised carbonate of soda	50 ,,
Chloride of barium	53 ,,
Nitrate of silver	150 ,,
Alcohol	1 ounce.

The mixture of water, gelatine, and starch to be raised to a temperature of 130° to 150° Fahr., and the chloride of barium and nitrate of silver to be added at a temperature of not more than 110° Fahr. After filtering, the emulsion is ready for use.

The following formula for a bromide of silver emulsion for development I have found give very satisfactory results:—

Water	20 ounces.
Nelson's gelatine (No. 1 photographic)	300 grains.
Hard gelatine	300 ,,
Starch	200 ,,

The temperature of this mixture is raised to, say, 140° Fahr., and then

Bromide of ammonium	200 grains
Ammonia nitrate of silver	200 ,,
Nitrate of silver (dry)	100 ,,
Alcohol	1 ounce

are added, the bromide and silver at a temperature of 100° to 110° Fahrenheit.

After filtering, the emulsion is ready for coating.

Surfaces coated with the emulsion last described may be developed with any suitable developer, but I prefer to develop with a ferrous-oxalate developer as follows:—

No. 1.

Oxalate of potass	20 ounces.
Water	80 ,,
Bromide of ammonium	400 grains.

No. 2.

Water	80 ounces.
Protosulphate of iron	4 ,,
Citric acid	½ ounce,

Equal proportions of No. 2 being added to No. 1 for use.

After washing, the film is hardened in a solution of alum having the proportions of one ounce of alum to sixteen ounces of water, and fixed in fresh hyposulphite of soda solution, containing three ounces of hyposulphite to a pint of water. If the prints are not required to be mounted at once, they are best blotted off by blotting-paper, otherwise water drying marks are likely to form.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. In the preparation of silver haloid emulsions for photographic purposes, the use of a vehicle composed of gelatine and starch, or its analogues, substantially as, and for the purposes, described. 2. The manufacture and use of silver haloid emulsions for photographic surfaces in which starch, or its analogues, is embodied, substantially in the manner and in the proportions stated.

AN IMPROVEMENT IN THE MANUFACTURE OF PHOTOGRAPHIC PLATES.

No. 5932. OTTO MAGERSTEDT, 183, Reichenbergerstrasse, Berlin, in the German Empire.—*January* 20, 1894.

THIS invention relates to an improvement in the preparation of photographic plates, and its purpose is to avoid the effects of halation and solarisation.

It is well known that photographic images of subjects presenting strong contrasts of light and shade, prepared with the plates hitherto generally in use, are liable to halation and solarisation. Many attempts have been made to avoid this defect, but none of them have entirely removed it. These attempts, moreover, were mostly attended with inconvenience in the preparation or the mode of employing those plates, and the preparation of such plates, as, for instance, the so-called Sandell plates, was complex and very expensive.

I have discovered that, in a very simple way, which is capable of general

application, photographic plates can be prepared, by the use of which the defects above mentioned can be entirely avoided.

For this purpose, between a layer of haloid silver emulsion and the material carrying it (glass, film, or the like), I place a coloured layer prepared from colouring matters, which before, during, by, or after developing or fixing, can be removed or rendered colourless.

I thoroughly clean the plate and coat it with this layer, which consists of a solution of the colouring matter, such, for example, as magenta, in gelatine. I dry the coating, and over it I put the sensitive layer of haloid silver emulsion in a weak red light, then dry the plate in a dark room. The plate thus prepared is ready for use.

As colouring matters preferably employed for this preparation of plates, the red colours of the rosaniline series and their sulpho-acids are used, also those of the rosolic-acid series, and the products ranging in constitution between the two series mentioned above, the red and yellow dyes obtained by the so-called Aurine process, also the safranines, phosphines, uranines, and the like.

By treating a plate prepared as above described with an acid fixing bath, and afterwards well washing, it is rendered colourless.

When certain developers are employed, as, for instance, "Rodinal" (aqueous solution of para-amido-phenol-sodium), the discolouration takes place in the developing bath.

The claim is:—1. The manufacture of photographic plates by placing between the sensitising haloid silver emulsion and the plate itself a layer coloured with dyes of the kind specified, substantially as and for the purpose set forth. 2. Photographic plates prepared substantially as herein described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
19.....	Camera Club	Testing Slides in the Studio.
19.....	Croydon Camera Club	Lantern Night. Members' Slides.
19.....	Glasgow and West of Scotland .	
19.....	Leeds Photo. Society	*Bromide Printing: Variations by the Use of Different Developers.* J. H. Walker.
19.....	North Middlesex	*Gleanings from Picture Galleries.* F. L. Pither.
19.....	Richmond	
19.....	South London	
20.....	Birmingham Photo. Society ...	
20.....	Brixton and Clapham	
20.....	Derby	
20.....	Exeter	Prize Slides.
20.....	Hackney	
20.....	Hastings and St. Leonards	
20.....	Keighley and District	
20.....	North London	
20.....	Paisley	
20.....	West London.....	*Development.* J. J. Adam.
21.....	Brechin	
21.....	Bury	
21.....	Croydon Camera Club	Last Public Lantern Show of the Season.
21.....	Leytonstone	*Stereoscopic Photography.* Thos. Bedding.
21.....	Manchester Camera Club	
21.....	Photographic Club	*The Daguerreotype Process.* W. England.
21.....	Southport	
21.....	Southsea..	
22.....	Bristol Camera Society	*Photo-micrography.* M. E. Dunscombe.
22.....	Ealing	Lantern Evening for Trying Slides.
22.....	Glossop Dale	
22.....	Hull	
22.....	Ireland	
22.....	London and Provincial	Lantern Slides of Chicago. H. M. Smith.
22.....	Oldham	
22.....	Tooting	Annual General Meeting.
23.....	Croydon Camera Club	Excursion to Dorking. Train from West Croydon, 9.50. Leader, Mr. Isaac.
24.....	Hull	
24.....	Leytonstone	Open Social Evening.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

MARCH 13,—Ordinary Meeting, the President (Sir H. Trueman Wood) in the chair.

The PRESIDENT said that, as this was the first occasion of his presiding over a meeting of the Society, he would like to express his thanks to the members for electing him to the presidency. He could assure them that he would do his best during his year of office to fulfil the duties of the chair.

It was announced that the following Societies had been admitted to affiliation of the Society by the Council:—The Central Photographic Club, the Ipswich Photographic Society, the Staffordshire Potteries Photographic Society, and the Photographic Section of the Oxford Natural History Society.

Several presents of books to the library by Mr. Cembrano and Mr. Dollond were announced, and the donors thanked.

TONING PLATINUM PRINTS.

Mr. E. J. WALL, referring to some remarks he had made at the previous meeting of the Society, said that he had tried Vogel's method of intensifying platinum prints by means of potassium chloroplatinite and ferrous oxalate, but had not been able to get satisfactory results. Liesegang had recently published a process of intensifying by means of aristogen and nitrate of silver. Aristogen was a preparation of hydroquinone, acetic and citric acids. He (Mr. Wall) had tried the process, and had brought results with him. His method of working was, after the platinum print had been cleared with hydrochloric acid and thoroughly washed, to treat it with the acid developer containing silver. When the silver was mixed with the acid developer, the solution turned thick and clotty, and quite white. After some time, however, metallic silver separated out, but before that the prints were considerably intensified. They are then fixed and washed. The toned image could be treated with various reagents, and a variety of other colours obtained; among others he mentioned sulphocyanide and gold. Since conducting his experiments he had discovered that Mr. Rowland Bryant gave exactly the same process at the Camera Club on May 23, 1892. Mr. Wall concluded by saying that there was no staining of the whites by this process, and, as regards the permanency of the silver-toned platinum image, said he thought it would have as fair a chance of being as permanent as an ordinary silver print.

Mr. A. W. DOLLOND confirmed Mr. Wall's experience in being unable to intensify platinum prints with platinum. He had had no experience with silver, but thought it far better to use some more permanent metal. As regards invisible detail being brought out by the intensifier, as mentioned by Mr. Wall, possibly there was a faint deposit of platinum which might not be visible, but which would become visible when intensified. He did not think any intensification would take place where no platinum was present. Possibly some other metal besides platinum was there.

Mr. WALL said he had tried the deposition of palladium, iridium, and gold with the acid developers. There was a faint deposit with palladium and iridium. The silver image could be replaced with iridium accompanied by a distinct change of colour.

Mr. THOMAS BOLAS stated that Liesegang had recently found that organic colouring matters had a tendency to adhere to metal in the case of platinum and silver prints; possibly they converted them into pigment prints. As to the bringing out of invisible details, he had fixed a collodion-emulsion plate directly after exposure, washed, and, by means of physical intensification, a full, bright image was obtained. Possibly a small amount of metal was liberated by the action of light.

Mr. CHAPMAN JONES deprecated the deposit of silver on platinum prints. They could not depend on silver prints, and he thought the toning process would make an uncertainty of a certainty. He was of opinion that the difficulty of depositing anything on the platinum image was evidence of its stability. He had found silver in platinum paper, but never in the print, and did not think it possible that it was present in the image. Referring to Mr. Bolas' experiment, he doubted whether light decomposed the silver salt.

Mr. WALL, in reply to Mr. Chapman Jones, said he had tried toning platinum prints with uranium and other agents, but only got a messy result. Immersed in a palladium solution for thirty-six hours, it went brown all over.

Mr. L. WARNERKE would use gallic acid instead of pyrogallic for the toning process.

Mr. J. SPILLER said it was a matter of considerable interest to know that we could build up on the platinum base. No doubt the result, chemically, would not be so permanent as a true platinum image; but silver in the reduced form must be more permanent than the silver of an albumen print, which would augur a considerable degree of permanence for the silver-toned platinum print. He thought it was a pity Mr. Rowland Bryant's paper had appeared in a paper like the *Camera Club Journal*, which was not generally accessible.

After other remarks, a vote of thanks was passed to Mr. Wall for his communication.

PHOTOGRAPHIC CLUB.

MARCH 7,—Mr. M. L. Troup in the chair.

The HON. SECRETARY read a letter from Mrs. Levy, thanking the members for their expression of sympathy in the loss of her son, Mr. A. M. Levy.

Mr. CROFTON showed a collodion stereoscopic slide which had been in his possession thirty years. This was much admired. He also showed two quarter-plate negatives, one taken with a Goerz lens at *f*-8, the other with an opera-glass lens at *f*-64, the definition in both being extremely good.

Mr. E. W. FOXLEE thought the transparency was on an albumen plate, not collodion.

Mr. NESBIT said it was not correctly mounted, there being an excess of picture on the left hand of the left picture, instead of being on the left of the right-hand picture.

Several other members concurred.

Mr. Bulbeck showed a stereoscopic print of the moon by Professor H. Draper.

COLLODION DRY PLATES.

Mr. J. NESBIT introduced the subject by saying that the collodion process was a very charming one. There were two collodion processes, washed and unwashed; the unwashed contained salts which had to be washed out, resulting in bad marks. The water in emulsion caused reticulation. There were no deleterious salts in a washed emulsion. Remarking that it was difficult to get a suitable pyroxyline, he said that the best he had used was got from Rouch & Co. In emulsion-making, he was careful to have an excess of bromide; he did not approve of an excess of silver, as it would be likely to cause comets. He generally used bromide of ammonium, as he thought it gave a better colour of image. The bromide must be fresh. Having made the emulsion, it was only necessary to coat the plates as with collodion, and dry.

Mr. CHILD BAYLEY advised that the emulsion should be put in a box out of doors, to allow the ether fumes to evaporate.

Mr. NESBIT found unwashed emulsion plates very slightly more rapid than washed emulsion. There was no difference in sensitiveness between an emulsion containing excess of silver and one containing excess of bromide.

Mr. CHILD BAYLEY asked if it were known that over-exposure of a collodion plate ever caused reversal.

Mr. NESBIT had never experienced it.

Mr. A. MACKIE thought a washed emulsion was better than an unwashed, as it was easier to wash an emulsion than each plate. An excess of silver gave

greater rapidity than an excess of bromide, but was more liable to cause spots.

Mr. E. CLIFTON found that the Hill Norris lantern plates required a very vigorous negative. They were easy to intensify if it was difficult to get density in development. He had obtained warm tones on them.

Mr. MACKIE preferred using bromide of ammonium to bromide of cadmium.

Mr. NESBIT developed with liquor ammoniæ, carbonate of ammonia, and pyro.

Mr. MACKIE said that celloidin was now sent out in dry form, which gave an opalescent film. The pyroxyline should not be weighed, but sufficient added to get a proper thickness of collodion.

Mr. CHILD BAYLEY had made an emulsion plate which rushed up in development. He inquired the cause. It gave a plum-coloured image.

Mr. NESBIT thought it was due to the use of liquor ammoniæ in development. He advised the use of carbonate of ammonia.

Mr. MACKIE advised pyro, 4 grains, with sulphite; bromide, 3 grains; ammonia, 2 minims; water, 1 ounce. He found no difference in result from keeping emulsion.

Mr. CHILD BAYLEY asked if it was advisable to dry the plates by heat or spontaneously.

Mr. MACKIE thought it did not matter.

Mr. L. MEDLAND always dried by heat; an almost unlimited degree of heat could be used.

Mr. E. W. PARFITT had used water at 150° for development, without any signs of frilling appearing.

It was decided that the Easter Monday excursion should be to Guildford, Mr. Troup acting as leader.

MANCHESTER PHOTOGRAPHIC SOCIETY.

MARCH 8,—Mr. J. Wood (President) in the chair.

Mr. J. WARBURTON introduced as the topic of the evening the working of gelatino-chloride printing-out papers, submitting specimens toned and fixed in a bath of the following composition :—

Hypo	6 ounces.
Alum	½ ounce.
Nitrate of lead	10 grains.
Water	20 ounces.
Gold	2 grains.

Mix the alum and water, and let stand eight or ten hours, then add all the other ingredients except gold, which is to be added fifteen minutes before using. Use the bath only once; tone prints without preliminary washing. He had found the nitrate to work better than acetate of lead.

Considerable discussion on the working of the paper followed. It was recommended to first dry the prints, then re-wet them for obtaining the best and most certain results when glazing them on talced glass plates.

The PRESIDENT found that a tendency to staining could be prevented by frequent washing in fresh water before toning.

Mr. SCHOFIELD and the HON. SECRETARY (Mr. Farrow) gave particulars of copying prints by artificial light, recommending that the source of illumination should be placed directly over the lens on the top of camera, using either a gas jet or magnesium wire, the light to be stationary in both instances.

Mr. WHITTAKER showed how two legs of an ordinary tripod stand, with the addition of a cross bar, could be readily adopted to suspend a transparent screen for lantern purposes.

Several suggestions were made for photographic excursions during the coming summer.

The Exhibition of members' work takes place next month.

Central Photographic Club.—March 9, Mr. R. Beckett in the chair.—Mr. HOWARD FARMER read his paper on *Exposure Meters and a New One*, and described all the leading types, including Watkin's Regular and Junior, Wynne's, Hurter & Driffield's actinograph, the Ilford and Wormald's, Dibdins and Barnet tables. The new one he introduced to the members he called the Polytechnic exposure indicator, which consists of a slide rule with tables, &c. He assumed a typical case of enlarging a miniature to 24×18, with *f*-120, in an ordinary room, with instantaneous isochromatic plate, with yellow screen, and asked the opinion of members as to length of exposure. Several guesses were made, but Mr. Farmer stated it would be 100 years. He proceeded to show how this result was arrived at. In studios, as compared with outside, the ratio of exposure was generally about 1 : 6 or 8, in ordinary room 1 : 16 to 30 more. The colour of the objects alone might affect the exposure from 1 to 30. He suggested a committee to consider the action of the different exposure meters, with typical subjects.

Croydon Camera Club.—March 7.—*The Development of Gelatino-chloride Paper* was explained and illustrated by Mr. A. E. ISAAC. The demonstrator was of opinion that there was little benefit accruing to the practice of under-printing and developing up; none the less, several of the prints so obtained (including a view on the Eden, manipulated with a number of others during the evening) exhibited some unusually fine gradation and colour. Hydroquinone was used on paper which had been "bromised," and was subsequently toned in the combined bath, which had an intensifying effect upon the developed image. Other prints were treated with gallic acid, as advised by Mr. Leon Warnerke (in which case no bromising is called for). Upon these the toning bath has a slightly reducing effect. Mr. J. PAICE considered that the process of developing print-out paper often yielded results otherwise not easily, or at all, attainable. Mr. G. R. WHITE was of opinion that disappointments often met with were due to the fact that weak—if not strong—actinic light is allowed to act upon the ordinary gelatino-chloride paper during the processes of cutting, packing, &c., and spoilt it for developmental purposes. He then exposed some gelatino-bromide paper, which he had previously "chlorised" in ruby light, to five feet of magnesium ribbon; placed in the gallic acid bath two prints, developed up in a satisfactory manner, except that they were somewhat over-exposed. A warm vote of thanks was accorded Mr. Isaac. In reply to several miscellaneous questions, Mr. J. PIERCE stated that covering a negative with retouching medium did not, in his opinion, preserve it from moisture, whether of atmosphere or from damp printing paper; negatives so covered could be intensified in the mercury bath in spite of the supposed imperviousness of the retouching medium. The President exhibited a number of photo-mechanical prints by A. Diston, and by Sutton & Co. (powdered glass prints). Mr. Cordon showed some prints illustrating the benefits of his methods of sky-shading during exposure. Two views on Mitcham Common had full but delicate skies with clouds together, with fully exposed foreground. Mr. Smith showed negatives of some clever snap-shots of footballers taken at half past four on the Saturday previous. The public lantern show at the Braithwaite Hall, originally fixed for the 21st, has been postponed to April 4. On the 21st Mr. J. Smith will demonstrate the comparative rapidity of nine different makes of dry plates, following which will be shown members' slides on the screen, the best of which will be selected for the forthcoming public show. Mr. Jenkinson was elected a member.

Hackney Photographic Society.—March 6, Mr. E. Puttock in the chair.—Mr. HENSLER inquired as to what could be done with old platinotype paper kept in calcium tube for eighteen months. Mr. DEAN said that it might be used by printing the image right out, and then fixing in the ordinary way. Mr. S. J. BECKETT had done this, but could not recommend the results. Mr. GOSLING asked whether one sheet of ground glass placed before the negative would be sufficient to diffuse sunlight when used in daylight enlarging or reducing. To this was answered, Yes; but it was recommended that care be taken not to place the ground glass too close to the negative, or a grain would show. About six inches' distance would be about right. In reply to a request for hints for photographing interior of St. Albans Church, Wood-street, E.C., Mr. MOORE advised the use of the most rapid plates procurable, backed with caramel. As the church in question is rather dimly lighted, a long exposure was necessary—certainly not less that two hours. In lantern slides, the work of the following members was shown on the screen :—Messrs. Hensler, Roofe, Farmer, Gosling, A. Barker, Champneys, Fort, Sodeau, Barton, Guest, Selfe, S. J. Beckett, Wheeler, and Hull.

North London Photographic Society.—March 6, Mr. A. E. Smith in the chair.—Mr. W. BISHOP demonstrated the making of reversed negatives by taking advantage of the action of prolonged exposure to light, causing reversal of the image. The plate is exposed in a printing frame in contact with the original as in making transparencies, but sufficient exposure is given to produce a negative instead of a positive. Using Ilford ordinary plates, the exposure through a negative of ordinary density would be about five seconds to morning light. Recently he had experimented with magnesium ribbon, about five inches of ribbon being generally sufficient, burnt at a distance of six or eight inches from the frame. Mr. Bishop then made three exposures, and, on developing, the resulting negatives were perfectly satisfactory. He pointed out that, in developing reversals, the usual conditions of over and under-exposure are different, for, if the image flashes up at once, the plate has been under-exposed, and if it comes up hard and chalky, it is over-exposed. He used a mixed developer of metol and hydroquinone, but any developer could be used. Mr. W. WALKER then demonstrated the use of cresco-fylma, explaining how a stripped transparency film, whether enlarged or not, could be used for decorative purposes on vases, &c., or mounted on rough or smooth paper, opal, &c. The process could be used for reversed negatives by stripping the film and then mounting reversed on glass, methylated spirit (pure) being poured over the film when stripped if no enlargement of it was required. For this purpose, however, the process just demonstrated by Mr. Bishop seemed preferable. Messrs. Taylor, Taylor, & Hobson's improved lens fittings were shown, and Mr. A. E. Smith presented the Society with a useful little fitting to place on a gas bracket for joining the lantern hydrogen tube to it. It is supplied for fixing the "Perdu" reading jet to a chandelier.

West London Photographic Society.—March 6.—Mr. THOMAS FALL delivered a discourse on portraiture, entitled *Photographic Experiences*. Mr. Fall spoke as one who had worked Daguerreotype, the glass positive, the coffee, beer, and malt processes, and Russell's tannin process. He had made paper negatives, the prints from which are not to be surpassed for softness and beauty. The wet-collodion process has had a long innings, and for certain work was still the best. Mr. Fall ran over the points of these more or less obsolete photographic methods as one would recall the recollections of old friends, and, with many an amusing anecdote, he recounted his doings in the days when photography was young. Incidents of the studio were told with happy gusto—how the lady objected to be photographed from religious scruples, quoting the passage, "Thou shalt not make the likeness of anything," &c. Reverting to the collodion process, in which Mr. Fall said there was much of interest, he mentioned the scope it allowed for local development, reduction, &c. He would admit, also, that the dry plate was a great power, and the beautiful portraits of children we admire so much would have been impossible without them. Dealing with the studio, Mr. Fall strongly deprecated the new type of lighting, with unequal sides to the roof. He would have the light side of roof one-third longer than dark side. The glass should be frosted, and carried from end to end. A six-feet square window should be let into the centre of the dark side. The walls to eaves should be, say, eight feet high on light side, and rather more on dark side. With such a studio, reflections need not be employed to so large an extent, and a more natural lighting was obtained. The backgrounds should be eight feet square, and *movable*. A north light was desirable, but noth-east was equally good, except in early morning. In posing sitters, attention must be given to the character of the face. A stout, broad face required a side lighting. A venerable face would be spoilt by a high top lighting. Transition from high light to shadow should be gradual. Elevation of the camera was a point little considered, but marvellous results might be obtained by raising and lowering the camera. The Rembrandt style of lighting was one that gave a flattering portrait. The light was chiefly behind the sitter, and it required readjusting for each sitter. A newspaper was a good medium for reflecting light upwards. Portraits in the

n might be satisfactorily taken with a single-fold screen, one side being
, and an umbrella to intercept the top light. Early morning was the best
e. Mr. Fall advocated full exposures as ensuring proper gradation and
ness. In posing a sitter, endeavour to induce ease, and to preserve his or
characteristics. A profile was not always a likeness, but sometimes it
ht be the best likeness. Ignore the conventional. Retouching should be
lerately, intelligently, and artistically done. Mr. Fall showed many
utiful examples of his own work during the progress of his address in
stration of his remarks.

Woolwich Photographic Society.—March 8, Mr. W. H. Dawson in the
ir.—A lively discussion arose on the motion for the re-election of delegates
the Affiliation of Photographic Societies. It was a friendly, yet vigorous,
ack upon the work accomplished during the last two years covered by the
ort recently published. The CHAIRMAN, in opening, considered the word-
of the report a rehash of the flowery promises contained in the original
spectus, but very little real progress was shown to have been effected for
whole body, or for any Society contained within it. So far as he could
, the Societies were not more in touch with each other than they were two
rs ago. The Committee had certainly displayed no great energy. Take,
example, the question of reduced railway fares to members. This had been
hand, in a half-hearted fashion, for many months, with no satisfactory re-
its. Are the delegates contented with the reply made by the railway com-
nies? It is hardly likely that anything will be done unless more pressure
brought to bear upon them by the delegates, who, representing a vast
mber of photographers, possess greater power than they have hitherto
ercised. Mr. E. G. KEMBER and other speakers followed in the same strain.
r. H. BARKER hoped the Society would continue its connexion with the
otographic Society of Great Britain, and that a more optimist feeling
uld prevail with the meeting with regard to the Affiliation Committee.
ltimately Colonel C. D. Davies and Mr. J. Borthwick Panting were declared,
mid cheers, unanimously re-elected delegates. Mr. PANTING, in accepting
e position for himself and colleague, expressed pleasure that the members
ere interested in the movement. He believed that the delegates, as a body,
ere desirous of doing the best they could with matters which came under
eir notice, and to assist Societies enrolled with each other as far as the
heme would permit. Doubtless the machinery moved too slowly, the meet-
gs should be held more frequently. At present it was difficult to keep in
uch with the business before them. He felt stronger for this discussion,
nce it enabled him to gauge the wishes of the members, and it would be his
uty to embody the suggestions offered in proposals to be laid before the
elegates as suitable opportunities occurred. No doubt, much good could be
one if Societies would instruct their representatives to carry out certain lines
f action, and he hoped to find, through the reports of meetings of the Societies,
hat this would be done; general interest in affiliation matters would be created,
nd the position of the delegates would be stronger. The greater part of the
vening was devoted to an address and demonstration, given by Mr. C. J.
LLIS, on *Enlargements*, which greatly interested the meeting. The lecturer
escribed the various methods, giving preference to the oxyhydrogen light as
he best illuminant for amateurs to use, and explained with great care all
hings necessary for the process; taking nothing for granted, he all the more
elighted his audience. Several exposures were afterwards made, and, on de-
elopment, were found successful. Messrs. H. J. Dalby and Barker afterwards
ddressed the meeting, each offering useful tips.

Bath Photographic Society.—February 28, Fifth Annual General Meeting,
Ir. Austin King (President) in the chair.—The Chairman having resigned the
hair to the Vice-President (Mr. PERREN), Mr. PERREN then took the chair as
President, and delivered an opening address, in which he said: By the ex-
erience and efficiency of former Presidents, I am saved the necessity of having
o trace the early history of photography, its rise, progress, and rapid develop-
nents, notably lately the keeping up to date of our Society by the able dis-
ourse so lucidly given by our retiring President on what is called "Colour
hotography." Our Bath Society has experienced some vicissitudes, but it
as been safely piloted by the Presidents and Secretary through all the shoals,
c., which we have had to pass, and a little pride of the position we occupy
mong the institutions of the old city is pardonable. Our Society, though
omewhat young, is fairly paternal as compared with most others. I see that
t is tabulated that there are 391 photographic societies (or those which include
hotography in their syllabus) in the world, made up as follows:—239 British,
21 Colonial, 109 American, and 22 Continental, the parent society being the
Photographic Society of Great Britain, established in the year 1853.
Between that and our own come fifteen others, including that of our neigh-
bouring city, Bristol, founded 1866, so that in point of seniority we stand
seventeenth, having been established in 1888 (the year of the last visit of the
British Association), when Mr. James Glashier presided at the initiatory
meeting on the premises of a late member, and suitably urged the formation of
such a society. His address, founded on ripe scientific experience, did not
foreshadow an unchequered career, but emphasised the almost necessity for
such a combination as ours, and set forth the probabilities of usefulness which
its members have partly seen, and shall, doubtless, more fully do in the future.
The public audiences, technical education, photographic surveys, visitors, and
others expect much of us, and, without egotism, the Society may say that it
has, to some extent, well met, if not anticipated, the demands made, or to be
made, upon its resources, and the willingness and attainments of its members.
In conclusion, I would remark that photography has been, for twenty-four
years, my most pleasant occupation; in conjunction with another member, I
took it up about the year 1870 as an amateur. I need hardly remind you that
those were the days of the "wet-plate," a process which required unlimited
enthusiasm to carry one through the failures and disappointments inseparable
from the mastering of its technicalities. This attribute we, fortunately, both
possessed, and our carefully preserved negatives of that period carry many a
pleasant reminiscence of moving adventure by flood and field with them. Sub-
sequently I adopted photography as my profession, and I can say from ex-
perience that, if followed in its integrity, striving to attain a fairly high
standard it gives its own reward. It is needless to say that much art, so
called, can be brought into photography—also much of "humbug," and bad
work, and it is vexing, at least, to see what third and fourth-rate work is paid
for by the confiding or indiscriminating public. Photography *per se* must be
truthful, but distorting lenses, retouching, vignetting, double printing, &c.,
have now made it something more than its original self. I will not enlarge, or
say what or what not, but real art and real truth in photography must be
looked for by the public only from those who have artistic feeling, combined
wich the proverbial and, I hope, enduring honesty and integrity of a true
Briton. The SECRETARY having submitted the report and audited statement
of accounts, which were adopted, Mr. G. F. Powell and Mr. E. Lambert were
elected Vice-Presidents. The following gentlemen were elected as Committee:—
Mr. Austin J. King, Mr. E. J. Appleby, Dr. Norman, Rev. E. A. Purvis,
Colonel H. Sealy, the Very Rev. Monsignor Williams, Mr. D. S. Williams;
Mr. W. Pumphrey, permanent member of Committee. Mr. Middleton
Ashman was again re-elected (for the fifth time) Hon. Secretary and Treasurer,
with thanks for past services. Mr. PUMPHREY then gave a lantern exhibition
of members' work, mostly illustrating scenes visited by the Society during the
past summer, the contributors of slides being the Chairman, Mr. Pumphrey,
Colonel Sealy, Rev. Purvis, Mr. Powell, Mr. Mundy, Mr. Willcox, Mr. Swain,
and the Secretary.

Derby Photographic Society.—March 6.—A social evening in connexion
with this Society took place, when about forty members and friends met.
After partaking of an excellent repast, served by Mr. Smith in his well-known
style, the company spent the rest of the evening in a convivial manner, under
the chairmanship of their indefatigable secretary, Mr. T. A. Scotton. Songs
were ably rendered by members and friends, and special mention should be
made of the recitations of Mr. Eastwood, which were greatly appreciated. Mr.
T. H. Bennett, F.C.O., L.R.A.M., presided at the piano. In the course of the
evening reference was made to the position of the Society, which now numbers
eighty members, and the hope expressed that opportunity would be taken by
members to more frequently patronise the Saturday-afternoon outings arranged
during the summer, from which pleasure as well as instruction is derived.

Eastbourne Photographic Society.—March 7.—Dr. Habgood, who oc-
cupied the chair, proposed as Vice-Presidents Mr. G. A. Willis and Mr.
Alderman Morrison. These gentlemen were accordingly unanimously elected.
The Secretary (Mr. Hollway), announced a new competition, open to all mem-
bers of the Society, and congratulated them on the good fortune which had
given to its funds the sum of 40*l.*, granted from the balance in hand of the late
Eastbourne Arts and Science Association. After stating that it was the inten-
tion of the Society to hold an Exhibition during the ensuing autumn, he said
that one of its members, Mr. J. T. Rodda, had rendered such important ser-
vices to the Society that he moved that that gentleman be forthwith elected as
a member of the Committee of Management. This was also agreed to without
discussion. Mr. A. CATFORD then gave an interesting practical demonstration
on *Platinum Printing*, by the hot process. Several previously exposed prints
were developed with success, and favourable opinions as to the simplicity and
beauty of the process were expressed by many members.

Fairfield Camera Club.—March 9, the President (Mr. T. E. C. Wilson) in
the chair.—Mr. F. W. Anyon was elected a member. A demonstration was
given by Mr. H. J. Mallabar on *Brown's Zenotype Developing and Toning
Process for Gelatino-chloride Paper*, by means of which the lecturer got some
very beautiful tones, some of which were not obtainable by the ordinary gold
toning. The great feature of the process was the rapidity of the printing, as
many as 150 prints having been made in a day from the same negative. A
hearty vote of thanks was accorded to Mr. Mallabar.

Leicester and Leicestershire Photographic Society.—March 7.—An in-
vitation evening was a feature of the management of this Society at the
Co-operative Hall, when about four hundred of the members and their friends
assembled to hear a lecture by that veteran photographer, Mr. RICHARD KEENE,
of Derby, who kindly offered to read his lecture on *Derbyshire: Past and
Present*. The lecture, which was most lavishly illustrated with lantern slides,
was primarily intended to show the results of a week's tour in Derbyshire
some thirty years since, and the quaint manner in which the interesting and,
in some cases, amusing incidents of the journey were referred to, lent an
additional zest to the otherwise most interesting lecture, which was further
strengthened by several excellent slides of a more recent character.

Liverpool Amateur Photographic Association.—March 8.—Mr. E. J.
BROWN gave a practical demonstration of his process, *Zenotype*, and proved
to the large meeting of members present that any shade of sepia, purple,
green, &c., could be produced at will by this method.

Rotherham Photographic Society.—March 6, Mr. E. Isle Hubbard, M.S.A.
(Vice-President), in the chair.—One honorary member and one ordinary member
elected. Hon. Secretary showed prints on Eastman's platino-bromide paper.
The President (Dr. Baldwin) and Hon. Sec. were elected delegates to the
Photographic Society of Great Britain (Affiliation of Societies). Mr. HUBBARD
gave a paper on *Films*. He had been exceedingly successful in the use of films
for hand-camera exposures, and his experience had enabled him to form a very
favourable opinion of this class of support for the sensitive medium.

Dundee and East of Scotland Photographic Association.—March 1.—
Owing to the large number of lantern slides sent for exhibition, the adjudica-
tion of prizes on the sets of slides sent in for competition was remitted to the
Council, their decision to be intimated to the Special General Meeting of
March 6. Awards:—1st, T. L. Wynd; 2nd, V. C. Baird; 3rd, J. Thow.
MARCH 6, Special Meeting.—A demonstration of the Paget Prize Plate Com-
pany's print-out papers was given by Mr. S. HERBERT FRY.

Edinburgh Photographic Society.—March 7, Mr. J. C. Oliphant in the
chair, the attendance of members being a large one.—The principal business
was a demonstration and lecture by Mr. HERBERT FRY on *The Qualities and
Advantages of the Paget Company's Printing-out Paper*. This was gone
through with deftness, and full explanations were afforded by Mr. Fry to the
questions on points of detail. At the finish he was cordially thanked in the
name of the Society. The remainder of the business was merely formal.

Glasgow Photographic Society. — March 1, the President (Mr. John Stuart) in the chair.—Thirteen new members were admitted. The question-box contained four questions: 1st, "Is the cold-bath platinotype process a patent process; if so, what is the number of the patent?" Some of the members thought that it was only a modification of the hot-bath process; others, that it was wrought as secret process, *i.e.*, the manufacture of the paper. One of the members stated it was a patent process, and promised at the next meeting to give the number of the patent. Second question: "What is the best height for the camera when taking portraits?" Most of the members thought that the best height was about the centre of the picture to be photographed. Mr. ANNAN thought that the camera should be somewhat looking up, as, by so doing, more dignity was given to the figure, and instanced the "throne," as used by painters, for this purpose. The PRESIDENT thought that, for full-length figures, the camera should be rather low, otherwise the foreground would show in too rapid perspective; but, for busts, the height of the camera should be as near the centre of the figure as possible. Other questions were of so much importance that it was resolved to print them in the notice calling the next meeting, so that members would have time to consider them. The PRESIDENT intimated that, owing to the illness of Mr. Burchett, that gentleman had been unable to send the promised examples of the isochromatic photographs shown last month to the Camera Club, but hoped to be able to send them in time for the next meeting of the Society. Mr. Fry, of the Paget Prize Plate Company, then demonstrated the Company's lantern plates for development and printing out. The PRESIDENT intimated that the next meeting of the Society would take the form of a Salon Night, at which they would be joined by their lady friends, on March 29, which would close the session.

Photographic Society of Ireland.—March 9, Mr. Hedley (Vice-President) in the chair.—After the ordinary business was got through and two new members elected, Mr. FREDERICK EASON gave a paper, entitled *Spots at Stops, not Stops at Spots*, as announced on the Society's programme. The paper was an account of a varied and extensive tour through the south and west of England. A great number of very excellent slides were shown by Mr. Eason of places at which he stopped, and a large amount of interest was added to the pictures by the excellent description of each slide. All Mr. Eason's exposures were made on Eastman's films, and were uniformly successful. The meeting was brought to a close by a number of very-much-admired slides shown by Mr. Gane.

FORTHCOMING EXHIBITIONS.

1894.		
March	.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
,,	26–28	*Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.
April	3, 4	Rotherham Photographic Society (non-competitive).
,,	5–7	*Aston Natural History and Photographic Society. Hon. Secretary, F. W. Pilditch, 133, Wills-street, Aston.
,,	13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,,	16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

FORMALIN.

To the EDITOR.

SIR,—*Apropos* of Mr. Glew's note on formalin in last week's issue, I can confirm most of his experiments. Of course, the action of aldehydes on gelatine has been known for some time; but I fancy Gegner was the first to utilise the tanning property of formic aldehyde. His method was extended by Hauser (*Maeuch. Med. Wochenschr.*, No. 35, 1893), and, after reading his note, *I* was induced to try its action in photography.

I found it to possess great tanning properties, both in solution and in vapour; but I likewise found it had two serious defects. Gelatine subjected to its action became more or less opalescent, so much so as to interfere with the purity of a lantern plate. Then, again, formic aldehyde possesses in the highest degree the property of reducing silver to the metallic state. The slightest trace of silver thiosulphate or any silver salt seems to be reduced without the aid of heat, producing a fine veil over parts where we neither expected nor wanted it. Hence the moral—be sure your negative or print is thoroughly washed before tanning it with formalin.—I am, yours, &c.,

J. B. FINDLAY.

March 13, 1894.

PORTRAIT BACKGROUNDS.

To the EDITOR.

SIR.—Much as I appreciate Mr. Dunmore's article in your last iss on "Portrait Backgrounds," there is one statement to which I must ta exception. At page 150, second paragraph, Mr. Dunmore says, "M Edge's plan was to lay over the print a piece of plain thin glass, and pai over all those parts on this cover glass that required shading with bla varnish," &c. This was *my* plan and not Mr. Edge's, and was fully d scribed in your pages by me about 1872 or '73. Mr. Edge's plan, before adopted mine, was the one in general use, I believe, in chromo-lith printing, an oblong mask at the opposite corners of the plates, bo portrait and background, each carefully registering the other; but th method, owing to the expansion or contraction of the paper whi printing, was very liable to cause a white line round the figure which ha to be worked out on the face of the print in Indian ink. By using m method a background can easily be added to a figure subject without an perceptible line. I hope Mr. Dunmore will pardon me for making thi correction.—I am, yours, &c.

J. M. YOUNG.

LANTERN POLARISCOPES AND JETS.

To the EDITOR.

SIR,—Mr. Chadwick, in his letter last week, assumes that I am referrin to him as the "scientific gentleman of the north;" but as he is a residen of the midlands, and the gentleman I alluded to lives north of the Twee the two cannot be one and the same person. The suggestion of a divide polarising bundle is quite distinct from the plan advocated by Mr. Chad wick, and which is a modification of the polariser used in most of th large lantern polariscopes now made, in fact is the same identically a shown in Mr. Lewis Wright's book on *Optical Projection* at page 346, fig 193, and given as the arrangement adopted by the Rev. P. R. Sleeman.

I was not aware until this week, when I had the pleasure of a visit from the designer, that Dr. Sidebotham, of Hyde, was responsible for the ingenious arrangement of using the polariscope with vertical attachment described by Mr. Chadwick at the Central Photographic Club and which he was not then able to show in operation (for want of gas). These various modifications show the possibilities of a conveniently constructed vertical attachment with a lantern, and Dr. Sidebotham is to be complimented on the simple method of obtaining a polariser with the ordinary mirror of vertical attachment and a glass bundle.

The divided-bundle suggestion was made as something worth trying, and it may or may not be practical, for I regret (one way) I have not yet had time to try it, my hands being very full just now with practical work (business) has not given me opportunities for experimenting or attending to some of the interesting claims on my time.

JETS.

That I should have been thought to alter my views regarding jets by the following statement I cannot realise:—

In my last paragraph of "Lantern Mems." for March 2, I say "but with mixed jets unless a complete revolution takes place, it seems as if finality has been reached with the conical and internally polished nozzle and nipples, the orifice in the latter being proportionate to the pressure used."

Of course, there are jets and jets, but it is nothing new in really A 1 jets to internally polish the nozzles so as to be free from roaring, and to make them on the plan Mr. Chadwick mentioned and showed by section drawing (smooth and taper inside); but, as to his statement that no better results can be obtained with the special or peculiar form of mixing chambers than an ordinary one, or without a mixing box at all, I cannot admit until I see two such representative jets of each kind tried side by side under similar circumstances. He says he showed the utter uselessness of a mixing chamber of any kind, but if he did so practically it must have been when I was not there.

All I can say in proof of my belief in conical nozzles as well as improved mixing chambers (as suggested by Mr. Lewis Wright) is that in the series of exhibitions given by Mr. J. H. Steward at the Imperial Institute, illustrating lectures and papers on Colonial subjects, a twenty-four foot screen is used and the light from these jets in a triple lantern with large-diameter long-focus lenses is far in advance of what it was with a best jet of ordinary construction with a free way to the mixing box, somewhat on the lines Mr. Chadwick advocated, the lantern in this case having ordinary-size lenses.

As soon as I get a little time I will try a jet of each kind in similar optical lanterns (side by side, one-half of each disc being used), and will let your readers know the result.—I am, yours, &c.,

G. R. BAKER.

London, March 10, 1894.

PHOTOGRAPHERS AND DEALERS.

To the EDITOR.

SIR,—"Thirty Years' Professional" has hit the mark. I have been some years Secretary of the South of England Traders' Association, and therefore can claim to know something about trading. I can safely say

never knew any trade so heavily handicaped as that of the professional photographer. When I read Mr. Fall's paper, I thought we were about to move in the right direction, coming with the combination against the piracy of our labours; now this letter of "Professional" backs it up. My experience is much the same as his.

I have a large business here, and a branch in a borough town nine miles away. I consider I have premises equal to any other tradesman in the town, quite central, and in the best business street; can buy largely, certainly as much for our profession as the whole of the chemists in the two towns put together; can pay cash; yet one of the principal wholesale houses write me as follows, "We find from further inquiries that the goods you buy are rather for your own use," and decline to supply me as a dealer, although they had previously sent me their *private* dealers' list. I had sent them my printed card, wherein I mentioned I supplied amateurs. Now, where could they have inquired? I presume of the two chemists at Farnham, where I have a branch. As these chemists sell their goods, we can guess their reply. No amateur would have said other than that we always supply all who call at maker's list prices, and I have before now done so at a loss, but shall not do so again. Here (Alton) the only two chemists do not pretend to dabble in our business; they are neighbours, and prefer sticking to their own profession, and have even sent people to me.

I must now drop the supply of this firm's goods, and push that of others that supply me upon dealers' terms. I think if a professional photographer puts his dark room at the disposal of amateurs at almost all hours free, and is the only one in the town to do so, can buy five or ten pounds' worth of goods at a time for cash, supply any maker's goods at list prices, he surely should be treated as a dealer before some small chemist. Some wholesale houses send you facts, scraps &c., and ask you to distribute them to advertise their goods, and then decline to treat you in a business manner.

One point more: one firm intimates their determination to put down cutting in prices below their lists, by refusing to supply those who do so. If they keep their word we shall not much longer see some of the London stores quoting one dozen of plates at elevenpence halfpenny. We must make up our minds to unite and break down monopoly.—I am, yours, &c.,

GEO. FROST.

Alton, Hants.

THE BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—Your correspondent F. I. A., in your issue of the 9th inst., in writing about the above association, objects to the word "benevolent," and seems to think that the word is misapplied and tends to deter professional photographers from becoming subscribers. I hope he is wrong in assuming that they are not benevolent; and, as to the misapplication of the word, I do not think a better or more proper name could be found for it, as the avowed object of the Association is to give substantial help from its funds to unfortunate and needy but deserving persons of the photographic profession although such persons may not have subscribed a penny towards its funds. If this is not "benevolence" pure and simple, what is it? I cannot think of a more correct name for it.

Your correspondent suggests the alteration of the constitution of the Association into a mutual benefit society; in which case what would become of the unfortunate persons situated as I have before described? Would the mutual render them any help? I think not.

I do not wish to underrate benefit societies, far from it, as I consider them excellent institutions; but I wish to point out that, where benefit societies could not give, "benevolence" steps in and supplies the needful.

And now, Mr. Editor, allow me to appeal to my fellow-professional photographers to show that they are benevolent and willing to support this excellent Association by becoming subscribers to its funds; the need for more help is plainly seen by the increased number of applicants, especially during the past year, when the amount given away exceeded the income.

Rally round and increase its usefulness at the risk of being looked upon as benevolent,—I am, yours, &c.,

C. F.

March 10, 1894.

NEWCASTLE-ON-TYNE INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—Will you kindly permit us to remind intending exhibitors that our last day for receiving pictures is April 4, and that Entrance Forms (A) should reach us by March 28?—We are, yours, &c.

J. BROWN,
W. P. BREWIS, } *Hon. Secretaries.*

The Art Gallery, Grainger-street, Newcastle-on-Tyne.

EXHIBITION AT THE FILLEBROOK ATHENÆUM.

To the EDITOR.

SIR,—The Committee of the Fillebrook Athenæum, Leytonstone, at their *conversazione* on Wednesday, March 28, intend to exhibit a number of photographs by local workers, and have much pleasure in inviting any of your readers (amateur or professional) living within five miles of Leytonstone to compete. Only framed photographs are eligible, and they must be the sole work of the exhibitor. The awards offered are one silver medal and five bronze, and it is hoped that Mr. Horsley Hinton will be able to undertake the work of adjudication. All exhibits must be received by Saturday, March 24. Further details will be gladly supplied by—Yours faithfully,

JOSEPH W. SPURGEON.

Fillebrook Institute, Fairlop-road, Leytonstone, E., March 12, 1894.

A CORRECTION.

To the EDITOR.

SIR,—In the report of the Ealing Photographic Society's meeting, published in THE BRITISH JOURNAL OF PHOTOGRAPHY of March 9, I am credited with having made the lantern slides of Buckingham Palace, &c. I therefore beg to say that most of the slides shown by me on that evening were the work of the Woodbury Company, and not by—yours, &c.,

CHAS. WHITING.

48, *Denmark-road, Ealing Dean, W.*,
March 12, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Two handsome backgrounds, 8×8, by Duran, interior and exterior, cost two guineas each. Exchange for hand camera.—Address, W. J. HARE, Sutton, Surrey.

Imitation stone wall and garden gate in three pieces, cost 1*l.* 10*s.*, exchange for headrest or interior background.—Address, S. BUSBY COX, 7, Bright-street, Peterborough.

Wanted, rolling press, not less than 12 × 10. Tricycle or ten-inch burnisher in exchange, or both for a large-size machine.—Address, R. H. BLYTH, 3, Belgrave-villas, Ilfracombe.

Optimus four-inch lantern, forty slides, box of Barnard's varnish colours in exchange for 10×8 rapid rectilinear lens or whole-plate camera and slide.—Address, G. MOORE, Buckfastleigh.

Will exchange six Tyler's whole-plate metal double dark slides and good cabinet burnisher, all in good condition, for whole-plate rectilinear lens or whole-plate wood slides.—Address, R. H. RAMSAY, Lerwick, N.B.

Wanted, 10×8 or whole-plate sliding box camera with single or double back in exchange for Optimus embossing press, with three dies for cabinets and three dies for *carte-de-visite*, also indiarubber pad.—Address, J. H. SMITH, Tobacconist, Little London, Rawdon, near Leeds.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:

Harry Piquet, Port Talbot.—*Photograph of Rev. Morgan Powell.*

John James Bayfield, 37, Gipsy-hill, S.E.—*Four photographs of Mr. Ben Davies.*

William Blake, Bedford.—*Two photographs of George William Erskine Russell, Esq., M.P.*

Adolph Lipschetz, Manchester.—*Photograph of Lieut.-Colonel Michael Goldsmid and David Philip Schloss.*

Marshall Wane, Edinburgh.—*Four photographs of the Right Hon. J. B. Balfour, Q.C., M.P., Lord Advocate for Scotland.*

W. E. WOODBURY.—Received, thanks.

WILLIAMS.—The address is Theobald's-road, W.C.

PIONEER; J. T. R., and others.—Thanks; in our next.

PHOTOS.—The address is unknown to us. Get a finder of two-inch focus.

THEO. J. GIDDEN.—The lens would probably not fetch more than twenty or twenty-five shillings.

TRIPLET.—The triplet mentioned is rectilinear, but we do not know what size of plate it will cover.

SOUTH DEVON.—We believe that the mechanism of the changing arrangement referred to answers well.

RATES.—So far as we can see, the studio is certainly subject to being rated the same as any other business premises.

A. G.—A red fabric, like the sample enclosed, will be quite safe, even should the window be four feet by two feet.

C. BENNET.—Try equal parts of one per cent. solution of ferridcyanide of potassium and sulphocyanide of ammonium.

F. E. CROSS.—Obtain Mr. Dunmore's work. That will give you the desired information more fully than we can afford space to do in this column.

ST. AUBIN'S, JERSEY.—To prepare your small prints for colouring, give them a coating of any good clear varnish. This permits them to take the colours well.

C. CLIFFORD.—We are not acquainted with the method of making the emulsion with which the small ferrotype plates, used in the automatic machines, are coated.

C. N.—We see no advantage to be gained by the use of a paste made of ground rice over that made with the best starch for mounting gelatino-chloride prints.

OTHELLO.—1. An unnecessary quantity of iron has been used. Why not precipitate with sulphide of potassium? 2. If only a little, no harm need be anticipated.

BEERNAERT DRY PLATE COMPANY.—At present no directory of photographers and dealers is published. Messrs. F. W. Beaufort & Co., of Birmingham, have one in preparation.

ARCANUM.—1. Both kinds of films are excellent. 2. Development, drying, and storing present no difficulties. 3. They do not curl in development. 4. Yes; pyro-ammonia may be used.

T. NICHOLS.—There is nothing very novel in your experience that the same emulsion spread on paper proves more sensitive than it does when on glass. Under some circumstances it proves very much more sensitive.

TONE.—The function which the glycerine performs in the process of toning platinum prints with gold, as described by Mr. Dollond, is to reduce the latter metal. Doubtless other organic substances could be employed.

A. M. Y.—If stains on the fingers cannot be avoided by you when using pyrogallic acid developer, protect them with indiarubber finger stalls. They may be had at all indiarubber shops, and the cost of half a dozen is but a few pence.

A. NORTON.—The alloy, now passing under the name of "brass," is too indefinite to say what is its specific gravity. It has no standard price. Dallmeyer *On the Tele-photographic Lens* will give the desired information very fully.

DAVID WILLIAMSON.—A portrait lens will be the most useful. If you want to take *carte*-size pictures, have a *carte* lens. We do not recommend any particular maker's goods. Write to different opticians for their price-lists, and select from them.

M. MARTIN.—The Copyright Act may be obtained from Messrs. Eyre & Spottiswoode. We do not, at the moment, remember the price; post free, however, it is but a few pence. As a matter of fact, every photographer should possess a copy.

S. C. M.—As you say you always get yellow prints with the "combined bath," why not use the sulphocyanide toning bath? It entails very little extra trouble, while the results, with most papers, are considered superior, particularly as regards probable permanency.

HADJI.—What happens upon mixing solutions of nitrate of silver and cyanide of potassium is this: the silver is precipitated as cyanide of silver, a whitish-coloured precipitate; upon adding more cyanide of potassium, this precipitate is dissolved, and the liquid becomes clear again.

R. O. C.—Success in collotype must not be expected unless the necessary conditions to secure it are fulfilled. A plate, "placed in a dark room," that took two days to dry, was not very likely to prove workable. The method is all right if the details be attended to. If these are not, don't blame the process.

T. F. BAXTER.—Without actually saying that the spots and stains are really due to the hyposulphite of soda, it certainly looks very much as if they were, considering all the precautions that have been taken. Hypo that becomes wet and emits an unpleasant odour is not the kind that is adapted for photographic use.

W. A. JACKSON.—You cannot do better than have spring roller blinds fitted to the ridge. They may be of some dark blue or green material, such as that used for ordinary window blinds. For the side, we should advise curtains of the same material running on rods. The door, if of glass, will do very well where it is shown in the sketch.

A. WILLIAMSON.—If the negatives are to be subjected to much use, we should not recommend diluted white hard varnish as a protection. Brown hard would be preferable, as it is much more durable than the other. It has more colour, but that is of little consequence. Proper varnish for negatives is in the market, which, while giving a colourless film, is more durable than the brown hard varnish.

QUESTOR.—It is not of consequence that the division or partition in the half-plate camera to form it into a stereoscopic one should extend quite to the front. Its length will be sufficient if it prevents the light which is transmitted through one of the lenses from falling upon the half of the plate on which the image formed by the opposite lens is projected. But, on the other hand, it is necessary that the back of the division comes moderately close to the sensitive plate—as near, indeed, as the dark slide will permit of.

C. BELL.—The flashlight is very good for portraiture when properly worked, but, at its best, it cannot be compared with the electric light for general studio work. Of course, the installation of the electric light is somewhat costly, even when the current is obtained from the mains; but, when the first outlay has been made, the light becomes very inexpensive, whether the current is taken from the mains or is generated on the premises. We certainly could not recommend magnesium where the extra cost of electricity is not of much importance.

D. W. (Elgin).—We should recommend you to have blinds, on the ordinary spring rollers, fitted to the ridge of the studio; or, if you make two feet six inches or three feet of the glass next the ridge opaque, the roller may be fixed that distance lower, as direct top light is rarely, if ever, required. That will shorten the top blinds. There will even then be a danger of their "sagging," but the trouble arising from that may be overcome by having each blind to overlap the next by about six inches. Make each of the eight proposed blinds five feet wide instead of four feet six inches. If each end of the roof were made opaque for about five feet, two blinds would be saved, as that light will never be required in practice. Blue blinds will be as good as any.

S. WILLIAMS writes: "I have some sulphide, which I know to be rich in silver, and which I should like to convert into the metal myself. Can you kindly inform me whether this can be done with an ordinary crucible and "kitchener," as temperature can be raised to a great height? I know the best thing to do would be to send it to a refiner's, but should like to try the experiment myself. Are you able to give me any information on the subject?"—The sulphide can be reduced to the metallic state in a kitchener if sufficient heat can be obtained, and it can be in some kitchenes. Thoroughly dry the sulphide, and mix it with equal parts of nitrate of potash and carbonate of soda in a mortar. Place a clay crucible in the fire, and when it becomes red hot introduce the mixture, a small quantity at a time, and, as it deflagrates, add more. After all has been introduced, increase the heat until the silver is reduced to the metallic state, known by its appearance, at the bottom of the pot.

*** *As Good Friday falls next week, the* JOURNAL *will go to press a day earlier than usual, so that all communications intended for the next number should reach us by Tuesday morning.*

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1768. Vol. XLI.—MARCH 23, 1894.

GELATINE PLATES FOR PROCESS WORK.

We quoted a paragraph from *Process Work* in our last week's issue, in which the comparatively little use made of gelatine plates in the various processes of reproduction was commented on, and the desirability of extending their employment in that direction was suggested. It is an undoubted fact, as stated in the course of the article referred to, that a sort of prejudice exists against gelatine plates for that class of work, and that wet collodion still maintains its supremacy for the purpose; but that it is an unfounded prejudice is, we think, open to easy demonstration.

We are not going to attempt to argue that, placing a gelatine plate in the hand of an operator who is accustomed to the wet-collodion process, he will at once turn out a result equal to, or even at all approaching, the style and quality of the work he habitually produces by means of the more familiar method, nor do we expect that even a practised gelatine worker would be at once able to compete with the wet-plate man in the reproduction of line work, or in turning out the particular class of negative required for the different photo-mechanical methods. But we are convinced that, if sufficient attention were paid to the subject, both in the preparation of the plates and their development, dry plates would prove themselves fully equal to the task required of them, and with the inestimable advantage over collodion of greater rapidity. In this latter respect alone, with a class of work that frequently has to be executed in a very short time and under all sorts of unfavourable conditions of light, it might be supposed that the benefit derivable from the use of gelatine plates would be sufficiently obvious to have induced at least some of those interested in the matter to investigate the subject; but in this country, at least, very little attention seems to have been given to it, although we believe on the other side of the Atlantic the case is different.

We fully agree with the writer of the article in the contemporary quoted, that the neglect of gelatine plates is really traceable to the fact that they have never had a fair trial. Those chiefly interested in the question, so long as they are able to produce what they want by existing means, are loth to depart from the beaten track in order to study and learn new methods; it may be their time will not permit it, but the result remains, that collodion still holds the field, and an impression prevails that gelatine plates are incapable of producing the combination of qualities that go to make a perfect negative, of line reproductions especially.

That such an impression is entirely erroneous was proved as far back as fifteen or sixteen years ago by Mr. R. Kennet, who produced work of this class upon gelatine plates that possessed every whit as much density and clearness combined as could be obtained with wet collodion under the most favourable circumstances. Another of the earlier experimenters with gelatine emulsion, and a former contributor to our pages, Mr. W. D. Richmond, himself a practical printer, also gave this subject a good deal of attention years ago, and showed the perfect adaptability of gelatine plates to the purposes of photo-mechanical reproduction, but to no purpose, for we have discussed the subject with more than one individual deeply interested in the matter, and have always heard the same story, gelatine has been tried and found wanting.

There was perhaps more reason for this failure twelve years ago than there is at the present time, for not only were our films then less perfect, but the majority of photographers were only learning development, and were practically tied down to one particular form. What wonder, then, that the old familiar friend, wet collodion, should hold its own? Now it is altogether different, for we have almost faultless films, an unlimited choice of developers, and a new generation of operators, who have been trained up in the practice of alkaline development. If any further inducement were required to use gelatine plates, there is little doubt, if the demand arose, that manufacturers could put upon the market a special plate for the particular purpose which would satisfy the most exacting requirements; but, up to the present time, it should be borne in mind that those who have succeeded, or partially, with gelatine have done so with a class of plates prepared for an entirely different purpose, namely, the accurate rendering of half-tone.

Those of our readers who have ever dabbled in the mysteries of emulsion-making will be well aware of the fact that it is far easier to make a good slow emulsion than a good quick one, and also that, in proportion to the degree of delicacy and rendering of gradation, so does the difficulty of securing vigour and density increase. In attempting to secure in the same preparation the conflicting qualities necessary for the proper rendering of half-tone, the manufacturer is working in quite a contrary direction to that required in the production of the extreme ends of the scale only—density and clearness, without any intervening gradations. It is, in fact, extremely easy to make a dense and, at the same time, perfectly clean emulsion not deficient in sensitiveness—that is to say, no slower for this particular purpose than the ordinary slow landscape plates—but which would be practically useless for any other class of work, owing to its inability to render the finer gradations of a half-tone subject. It is, in fact, but a question of demand and supply. If there should be a sufficient call for specially prepared photo-mechanical plates, there is little doubt the supply would not be long wanting.

But, even with such plates as are already in the market, it

is a fallacy to imagine that it is impossible to secure good results for at least many of the reproduction processes; although in others, notably those in which bitumen is employed, better work will still be obtained from collodion films. But the plates must be carefully chosen for the purposes, and not taken hap-hazard from amongst any that will work well in the studio or field. As a rule, it will be found that the slower kinds of plates answer best for the purpose under discussion, although slowness is by no means a necessary characteristic, for we have had experience with at least two different brands of "rapid" plates that give most excellent results when used for line work. As a rule, however, the more rapid films give images of too delicate a character to suit the class of work, and with such plates, however clean and free from fog they may be, it proves a hopeless task by any method of intensification to secure the requisite density.

Starting with a suitable plate, however, the battle is only half won, for at least as much depends upon the development. As compared with twelve or fifteen years ago, we stand at a most decided advantage in the matter of developers, thanks to the numerous new introductions of the past few years; but, if we come to examine carefully into the merits of one and the other, we shall have to fall back for this purpose at least upon "our old friend pyro," with perhaps hydroquinone as a possible substitute. The striking feature in connexion with the newer developers, more especially para-amidophenol, amidol, and metol, is their extraordinary energy in attacking the half-tones of the subject, and this peculiarity gives them a decided advantage over pyro or hydroquinone in the rendering of half-tone subjects, especially with brief exposures or in bad light; but, along with the ready production of the feebly illuminated portions of the subject, there is a delicacy and want of density in the higher lights that still further adds to the softness and gradation of a half-tone picture, but these are qualities which are diametrically opposed to the satisfactory reproduction of line work.

On the other hand, the cleanness of working of the acid developers and the absence of all tendency to abnormal reduction in the unexposed portions of the film are decidedly good points in their favour, and, for such purposes as do not require the utmost of density and contrast, these developers, with a suitable plate, may find employment.

Hydroquinone combines the cleanness of working of the newer developers with a much higher capability in the direction of density; but, under ordinary circumstances, it is very slow in its action, and, moreover, is not found suitable to all kinds of plates. Where, however, a plate is found that will admit of its use, no developer will give a more satisfactory result, either in point of density or cleanness and freedom from fog or discolouration.

But, after all, pyro will, we think, prove the process worker's sheet anchor, for, with the exception of its rather unfortunate tendency to stain the film, it has absolutely no fault, and that one is very easily guarded against by means of a judicious use of sulphite of soda. The stock solution should be made up with fresh sulphite, or preferably with meta-bisulphite of potash, the pyro being dissolved last; and, if sulphite be used, it should be rendered slightly acid with citric acid, in which condition it will keep colourless for a very long period. It is not necessary, as some imagine, to use a very strong pyro solution in order to get density; two grains of dry pyro to each ounce of completed developer will give all the density required if other conditions are satisfactory, and these conditions chiefly concern the other ingredients of the solution.

Foremost amongst these may be mentioned the desirability of a considerable increase in the proportion of restrainer used, not less than one and a half to two grains of bromide to each ounce. This quantity may be used with perfect safety, as there will be no half-tones to suffer injury, and, beyond getting out the image, there is nothing further to be looked for but density and cleanness, both of which are promoted by the free use of bromide. This should be added in like proportions to both the stock solutions of pyro and alkali, so that, in whatever proportions they may be mixed, the quantity of bromide will be constant.

As regards the alkali which is best adapted to the purpose, from careful trials we are inclined to think that, other things being equal, carbonate of soda gives the greatest amount of vigour, and exercises less softening action on the film than carbonate of potash. Ammonia may hold its position as the best agent in conjunction with pyro for half-tone work, but for the purpose under discussion carbonate of soda is preferable.

There is one powerful aid in the production of density on gelatine plates that may be mentioned here, namely, gallic acid. In a leading article in this JOURNAL, some six or seven years ago, the extraordinary effect of gallic acid in this connexion was mentioned, and since that time we have frequently used it, especially in copying line or similar work, when great density and clearness are required. The method of using it is to make a cold saturated solution, and to use this instead of plain water in compounding the developer. If the action should be inconveniently slow, less of the gallic acid solution can be used, the volume being made up with water.

In substituting gelatine for collodion plates, it must, of course, be borne in mind that, whatever difficulties may exist in preventing filling up of the lines whether from reflected light or chemical causes, when collodion is in question, will, owing to the greater sensitiveness of gelatine, be intensified to a corresponding extent, and that the precautions against such occurrences must be greater. The feeble light reflected from the black lines of an engraving will have a far more powerful effect upon gelatine than on collodion plates, and consequently will require stronger measures to counteract its action.

THE COLLODION PROCESS.

XV.—Stripping Collodion Films.

We have stated in the opening chapter of this series of articles that it was not the idea of the introducer of the collodion process that the pellicle should remain on the glass plate, but rather that it should, after the formation of the image, be removed from its fragile support and be used as a flexible film.

But it was found to be not quite an easy and certain procedure to effect the desired separation at all times without the occasional tearing of the film. Hence the principle was adopted of strengthening the pellicle previous to attempting its removal. In the same year (1855) both collodion positives and negatives were, by different individuals and different methods, removed from the glass plate.

In order to strip a positive, Alexander Rollason first produced the picture in the ordinary way, and then immersed it in dilute nitric acid, and allowed it to dry, after which colour, if desired, was applied, and a solution of asphaltum or Brunswick black in mineral naphtha of the consistence of cream was

poured over it, a paper backing was applied, and, after being placed in water, the picture separated from the glass.

It was subsequently found that black japanned leather or cloth, after being sponged over with acidulated alcohol and water, and pressed in contact with the collodion film, answered equally well, and flexible portraits of this nature were for several years regular articles of production.

For transferring negatives, Scott Archer applied to the finished and dried negative a varnish composed of gutta percha dissolved in benzole; and, when dried by a gentle heat, the negative was placed in water, whereby the combined film left the glass plate, and could be retained in a portfolio.

Other methods were afterwards devised. One was to transfer the film to a sheet of transparent gelatine by the agency of a liquid cement. Hill Norris's system, which formed an item in the patent granted to him for the preparation of dry plates, to which we have previously alluded, consisting in applying a strong solution of gelatine to the collodion picture, and, after permitting it to dry, giving it another coating of plain collodion, and stripping the compound film, which, while impervious to moisture, was also strong, elastic, light, and quite secure from the possibilities of breakage.

Numerous modifications of this combined film system were about this time suggested and successfully adopted, one of considerable excellence being to apply to the collodion film a varnish composed of any material insoluble in ether and alcohol —a favourite application consisting of a solution of indiarubber in benzole—and finishing with another application of collodion. Perhaps the system which has its analogue existing with the greatest vigour at the present time was that of Parkes, of Birmingham, which consisted in discarding the use of glass as a supporting medium, and substituting therefor a somewhat thick sheet of collodion (celluloid), on which was supported the iodised layer that was to be impressed with the image. The similarity of this to the gelatine-coated, rollable, and flexible celluloid films now so extensively used will suggest themselves, and yet precisely thirty-eight years have elapsed since Parkes' invention. Many excellent ideas were thrown out in the earlier times of photography, which are only now finding congenial soil for their fructification.

Without the stripping of the collodion film from the plate, ceramic photography would not have attained such a high place as that which it now occupies. But in this process it does not do to have the film strengthened by organic compounds like the others. The routine is something like this: A collodion transparency having been developed and fixed, is, after washing, transferred to a vessel of acidulated water. Tartaric, citric, sulphuric, and other acids appear to answer equally well as acidulants. In a brief period the film will be found to have floated from off the glass plate. It is then toned by being transferred to a solution of platinum, iridium, gold, or such other toning bath as is preferred. The slower and more thorough the toning, the better is the result. This toning may be effected while the film is still attached to the glass plate, although experienced enamellers prefer its removal from the glass prior to toning. After having been toned, the film, when floating in the water, is caught up on the surface of an enamel plaque, which is slidden underneath, after which it is burned in by the muffle furnace.

Stripped films are found very useful in certain photo-mechanical methods of printing, which, if the printing surface were produced direct from the glass negative, would yield a reversed picture. This is obviated by the reversed pellicular negative.

A DIFFICULTY SURMOUNTED.

We have lately been the means of solving a double difficulty of no very intricate character, yet sufficiently puzzling to cause an "old hand" to come to us for advice; hence a description of the trouble and how we got to the bottom of it may be interesting or useful to our readers. The first stage resulted in the usual manner—plates defective, grumble at the maker; but, as usual, it was not the maker but the user who was at fault, though the facts seemed really to point to defective plates at the outset. To be brief, the photographer who met with the trouble was experimenting with isochromatic plates, and on a particular day, using the same lens, the same yellow screen, plates from one box changed in the same dark room, and in one corner of the place, he obtained negatives which were sometimes perfect and at others perfectly useless through fog. The first step was to examine the camera for any crack or aperture which, according to the situation the instrument was placed in, might, or might not, permit light to enter and cause the fog, for it was noticed that the edges of the plate covered by the rabbet were quite clear glass. Result, nothing wrong to be discerned. The dark room was illuminated by artificial light, so that no difference of lighting through the varying positions of the sun could be operative. A thorough overhauling of the dark slide resulted in a verdict of "perfectly sound and light-tight." The chemicals were seen to and found in good order. No cause whatever could be suggested but bad plates. A fresh box was opened, an oil painting copied, and a perfect negative obtained. The very next day an oil painting had to be copied away from home, and, to ensure success, only the plates from the last-named box were taken out. When the plates came to be developed they were useless, through fog.

The great difficulty, it will be seen, arose from the fact that the plates appeared uneven, some bad, some good, so that there was no result from sending some to the makers and having them returned after the latter had exposed, developed, and sent perfect negatives. Nothing could be done but change the brand. This was tried with success for a while, but eventually the same evil made its appearance, and we were appealed to for aid. After a minute examination of all the apparatus, we finally had under inspection the yellow screen, and, trying it in the studio, obtained a good negative. Not, however, being perfectly satisfied, we looked at the screen more closely, and found that, although it had just been used in making a good negative, it bore signs of hard usuage. It was a thin, yellow, stained film, mounted on cardboard, and answered its isochromatic purposes admirably; but, on bringing it into full daylight, we were perfectly surprised that it should be able to allow a clear negative to be taken, for the surface was quite greyed when seen sideways in a strong light. This observation was the required clue; taking the camera into the open air, exposing a plate, and developing, a foggy negative resulted. The explanation thus became perfectly simple. The screen used over the lens when the latter was used in the studio was entirely protected from light by a large hood permanently fixed over the camera; consequently, the scratches simply acted as obstructors of the light from the object, and merely slowed the exposure to a trivial extent. When the camera was used out of doors, the screen received sufficient light from the sky to become a light-diffuser rather than obstructor between lens and object; it was a distinct veil of light, and, as such, was photographed, to the detriment of the negative.

The other difficulty we allude to was explained in a similar manner, though, we must say, it had not prevailed for so long

a time. Here also were good negatives in the studio—bad ones out of doors. A very short examination of affairs revealed the source of the trouble, which is almost too ridiculous to narrate. It was neither more nor less than the fact that the front surface of the lens was slightly dusty. When used in the studio, away from glare, it was absolutely without visible effect. Employed out of doors for groups (the lens was one of large diameter), more light was almost of necessity received full upon the dusty surface, each particle of dust then receiving light, becoming luminous, and consequently fogging the plate. From what we have observed in many photographers' working, we feel confident that such experiences as we have been narrating are by no means uncommon, and it is exceedingly probable that, in thus bringing them forward, we shall have given the key to many an unsolved mystery, and to that extent lightened the burdens of messieurs the plate-makers, upon whom too often is thrown the burden of many sins of omission and commission of which they are quite innocent.

Of course, the moral is: Firstly, when using a yellow screen, see that it is in perfect condition; secondly, see that all lenses are free from dust. This latter precaution, however, does not mean that the glass surface should be daily polished after the fashion of a housemaid and her furniture; but rather that the lens should be so kept as to receive no dust, and only occasionally wiped with a very soft cloth or leather, as, otherwise, its surface would quickly become like the yellow screen we described. In conclusion, we would say that no better evidence could be given of the value of our advice some little time ago, to invariably use a lens screen for all work, especially outdoor.

Photographic Outings.—Most Photographic Societies will now be considering the arrangement of their summer programmes. Seeing the want of success of the Saturday-afternoon outings of several Societies, as mentioned in their annual reports, it may be well for them to consider whether the time has not come when they would be better abandoned. Meetings arranged that do not come off, if not humiliating, are certainly not conducive to the welfare of anybody. Although official outings may not be appointed, there is nothing to prevent a few members from arranging amongst themselves for one that suits their convenience. Indeed, that is often done now, although there has been one arranged by the Committee elsewhere.

"Living Pictures."—What is known as the living picture case is not dead yet, nor, from what we are told, is it likely to be for some little time to come. The case was in the Chancery Court again on Friday last, when the motions were resumed for injunctions restraining the *Daily Graphic* and the *Westminster Budget* from infringing the plaintiff's copyright in certain works now being shown as living pictures at the Empire Theatre. Important questions relating to the German copyright law were raised and duly argued by both sides. In the end, the Judge (Mr. Justice Stirling) reserved judgment. Photographs and photogravures of the originals of the pictures in question have been familiar objects in most fancy stationers' and printsellers' windows for the last year or two.

A Serious Accident.—An alarming accident, through photography, happened one day last week at the Charterhouse School, Godalming. It appears that some four or five hundred of the scholars were arranged on a large platform, erected for the purpose, with the object of their being photographed. When all was just upon ready, the structure collapsed and the boys were precipitated to the ground. With the exception of one or two fractured arms, dislocations, and contusions, fortunately no serious injuries were sustained. One would have surmised that care would have been taken to make the erection rigid enough to hold the boys steady during the exposure. Had this been the case, it would have been more than strong enough to sustain the weight put upon it.

Photographic Salon, 1894.—The Photographic Salon, 1894, will open at the Dudley Gallery, Egyptian Hall, Piccadilly, on Monday, October 1, 1894, and remain open until November 3, following. The aim of the Committee is "to collect for exhibition only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution." The Committee say that "the great success achieved by the Salon of 1893 has established the Exhibition in the estimation of the public and of the artistic and general Press, and the Committee are determined to make every effort to ensure a still greater success and influence for the Exhibition of the present year." Full particulars and entry forms will be published and forwarded in due course. Mr. George Davison is, as heretofore, Chairman of the organizing Committee and Mr. Alfred Maskell, Honorary Secretary.

Photography at the Boat Race.—The annual Oxford and Cambridge boat race has for many years past been a red-letter event in the calendar of many hand-camera workers. On Saturday last, however, they were doomed to disappointment. The weather was fine, it is true, but a thick mist hung about the river, at times quite obscuring the opposite bank, which quite prevented anything like brilliant negatives being secured, and also rendered useless a captive balloon engaged by one of the illustrated papers. However, some enthusiasts, we are informed, "snap-shotted" their plates away, while more experienced hands reserved theirs for another occasion, or used them up on the motley groups of gentry in the neighbourhood of the tow-path, who manipulated with "three cards," or with "three little thimbles and one little pea," and the like. By the way, one would think photographs of this character would frequently be of service to the authorities at Scotland Yard.

The Trades Marks Question.—On Friday last a Bill was introduced, and read a first time, in the House of Commons "for the placing of a mark of origin on foreign goods." There is no question that a large quantity of goods of foreign make are vended in this country that bear no evidence that they were made abroad. Particularly is this the case with photographic apparatus, and material and scientific appliances generally. We were recently shown in a wholesale warehouse some thermometers of the more expensive kind which had "Made in Germany" written on the outside of the tubes. The writing could readily be removed by the finger nail, or, easier still, with a little benzole. The present law, in this case, was complied with, but in a very questionable manner. What the new Bill proposes to enact we cannot say until it is printed; but, be it what it may, there is, in face of so much more important business, very little prospect of its becoming law for some time to come.

Tinted Papers.—When pink-tinted albumen papers were first introduced the tint was very faint indeed. Since then, however, manufacturers have been making the colour more and more pronounced; indeed, at the present time, some of the papers now in the market give the finished print quite a roseate hue, which, though pleasing to some, is very offensive to others with more artistic tastes. One reason, perhaps, why many of the ready-sensitised papers are so strongly tinted is that the pink, to a large extent, disguises the discolouration which all papers undergo, more or less, by keeping. The most unfortunate thing about these pink-tinted papers is that the colour is fugitive when exposed to strong light. That would not so much matter if, when the colour was discharged, it left the paper with its original whiteness. In the majority of cases, however, it does not, but leaves an unpleasant yellowish brown tone behind. We

recently shown some pictures on the printing-out papers, toned, that had been partially exposed to a strong light. The tint had quite disappeared and left the unpleasant tone just ed to in the lights, which was highly suggestive of incipient g. The image itself, of course, showed no deterioration whatever.

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hotographers and Reduced Railway Fares.—At last meeting of the Woolwich Photographic Society a vigorous ck was reported to have been made by the Chairman and others the work accomplished by the Committee of the Affiliated eties, particularly with reference to the question of reduced way fares to members. The Chairman said this matter had n in hand, in a half-hearted fashion, for many months, with no sfactory result, and asked if the delegates are contented with the y made by the railway companies? He then adds that "it is lly likely that anything will be done, unless more pressure is ight to bear upon them by the delegates, who represent a large ber of photographers." It is the easiest thing in the world to ry. It might have been more interesting if the gentleman had nted out how "more pressure" could be put on the companies n the delegates have put. Should they combine by themselves, on behalf of the societies they represent, to "boycott" the com- nies, and not travel by railway at all until they were conceded luced fares? It seems to us that this is about the only kind of essure they can apply. Long before the Affiliated scheme was oted, the West London, with the co-operation of several other ieties, took the matter in hand vigorously, but with the same sult as the Affiliated Committee have met with. Railway directors ve the shareholders' interests to consider, and possibly think that, reducing the fares to so large a body as camera-owners, they uld at the same time be reducing their returns, because they uld not obtain an increased number of passengers. If the railway mpanies can be induced—and we all sincerely hope they may—to wer their fares to photographers, it will certainly not be by any *essure* the delegates of the affiliated societies will be able to put on them. The censured delegates have our sympathy—if they quire it.

FREEDOM IN MASKS.

(In Vindication of the Circle and the Oval.)

the forefront of some remarks, in which the writer states why he jects to masks of lantern slides having openings either circular or al, the following sentences occur:—

"There is, of course, no canon of art which, in distinct terms, pro- ibits the use of a circle or an oval, but it is a device to which very w painters in the past have resorted, and one which *no modern rtist would tolerate;*" and, further, "by a *consensus* of opinion in tistic circles, oval and circular pictures have *long since* been booed." (The italics are mine.)

If the above sweeping statements formed merely part of the irre- onsible chatter of the ordinary society meeting orator, nothing eed be said; but, appearing as the editorial opinions of a journal hose ostensible mission is to teach the photographic *dilettante* ow to dabble with distinction, they require some attention by all ho value the conservation of accuracy; especially as the early in- allation of error into the practice of photography by the tyro has answer for a good deal of work which is witness of wasted effort. herefore it is I purpose considering to what extent, if any, modern rtists use, or refuse to employ, the oval or circle shape in their ictures.

I need hardly say that one cannot expect to meet with a great bundance of any but rectangular openings, because there exist ertain more or less material checks upon artists using such others.

Firstly, any other but rectangular shapes are, as regards frames nd flats, very much more costly. Secondly, when either the circular r oval is chosen for a particular picture, it usually follows that the rame should be of the same outside shape; and not, as is sometimes ne case, made rectangular. But nearly every exhibition in London orbids any frame to be otherwise than rectangular, hence artists ho exhibit are practically debarred from painting round or oval ictures.

Then, again, the adoption of any departure from the plain rect- angle involves an additional complication in composition, which it is only human to shirk. Besides, as regards oval and circular shapes, there is small reason to doubt that, in a majority of cases, such are unsuited to the subjects chosen to paint.

For instance, where there are many straight or nearly straight lines, particularly architectural ones with perpendiculars or horizontals near the margins, a circular opening is obviously out of place.

Substituting for rigidly straight lines those which are approximately so—such as figures and other objects—and the same inappropriateness of circular openings is recognised: for instance, Lady Butler's *Roll Call*, or, turning to landscape, such types as Leader's *February Fill Dyke*, are familiar examples of subjects which could not by any minor rearrangement of composition be advantageously bounded by anything but a frame with a rectangular opening.

But, in spite of various circumstances tending to discourage the employment of circles or ovals, nevertheless, in direct contradiction to the sentences quoted above, modern artists *do*, with, all things considered, tolerable frequency and with much zest, adopt these graceful shapes.

Of this fact those who are in the habit of regularly attending studios and galleries must but be fully aware. For instance, in the very first room at the present Winter Exhibition of the Royal Academy are to be seen two (if not more) ovals, one a Gainsborough and the other a Reynolds. These, I presume, may be ranked amongst the moderns.

Again, I vividly recall two exquisite circular paintings, out of many others which were doubtlessly then hung at the 1892 Royal Academy: one, *The Squire's Daughter*, by Edward Patry; the other, that celebrated work by the President (Sir Frederick Leighton), *The Sea Gave up the Dead which were in it*.

Surely, after this last citation, there can be no need to go on multiplying examples of the employment by great modern artists of the maligned circle, although an imposing array might be compiled; indeed some, such as J. F. Herring, were notorious for their love of circular pictures.

But, while on the subject of openings, let me add, that not only may photographers justify themselves when the above-mentioned shapes are discreetly used, but they may, if so minded, employ more *outré* fashions of boundaries to their views with the knowledge that such have the sanction of high artistic precedent. Thus at the South Kensington Museum is to be seen the well-known picture, *Almsgiving*, by C. W. Cope, R.A. This is an upright, with the top terminating (like a Gothic arch) in a point! Then, again, many will surely recall Frank Dicksee's tantalisingly delightful presentment of Romeo and Juliet upon the enchanted balcony of Verona. This is an upright, with a dome top. Instances might also be readily found of rounded corners employed with pictures whose breadth exceeds their height, although at the moment of writing I only recall two; but these are a host in themselves, namely, *The Death of Procris*, by Henrietta Rae, and *The Mountain of the Winds*, by Frank Dicksee.

Reverting to circles and ovals, let me add that the last Academy Exhibition contained over a hundred of pictures of one or the other of these two shapes. That they were mainly miniatures takes nothing from the force of this fact, because, in our days, anyhow, there is, apart from custom, no supreme reason why miniatures should not be rectangular any more than oil paintings dealing with similar subjects; and, if the oval or round shapes were found to seriously militate against the effect produced, you may be sure that they would be discarded. No doubt it is just because such shapes are peculiarly beneficial that they are retained.

Whatever the maximum of dignity to which the *art* of photography may at times reach, there is small possibility of denying that, to all intents and purposes, its chief mission is in topography and portraiture, with sometimes a dash of decorative quality thrown in. That being so, how do we find that the manual monochromist treats such subjects? Does he shun the circle? Just the reverse. We need only look through the pages of the best illustrated magazines and journals to find that they literally teem with circular views, and also oval ones, the reason being that, in many instances where topography is the main object, the whole interest may thus be most conveniently and completely bounded. All the rest is but "leather and prunella."

It were sheer folly to either cut off a part or add a meaningless and needless amount of space in order to merely conform to the imaginary exigencies of an arbitrary rule of shape; hence illustrators very properly snap their fingers at such puerile trammels, which are frequently self-imposed by force of the survival of an oftimes senseless custom. Of course such shapes are at times selected merely to lend variety, but mainly because of certain reasons which are connected with pictorial composition. Thus, in supplying, say, twenty

or thirty wash drawings of out-of-door scenery in illustration of a given article, the chances are that one, or perhaps two, will not satisfactorily compose unless a round shape is employed. An example which will be familiar to many photographers of the judiciousness of a round mount was shown at the Photographic Society of Great Britain 1893 Exhibition—I refer to *Down from the Hills*, by Wilkinson. Those familiar with the effects of lines in composition will be able to appreciate the advantage gained in the above instance by the use of the expedient in question.

I trust in the foregoing I have established that there is no need to confine one's prints or one's lantern slides to the rectangular shape; at the same time I do not give you my own particular aversion or preference. Perhaps I dote on circles; or, maybe, like John Brett, the painter of sea pieces, I hold that, as we have two eyes arranged along a horizontal line, therefore it follows that all our pictures should be much wider than they are tall.

What I have sought to do is to show cause why there should be complete freedom granted to each photographer to work out his own salvation without being ridiculously restricted by any one's mere *ipse dixit* as to what are the limits of suitable shapes.

In all cases the best opening to use depends upon the subject and form of the picture and no secondary reason should be allowed to prevail when deciding upon what shape such opening should assume.

I trust on a future occasion to directly explain, both graphically and verbally, the beneficial effect which in so many instances follows the employment of circular or oval masks or mounts.

HECTOR MACLEAN, F.G.S.

ON THINGS IN GENERAL.

WE are still in the midst of a deluge of new printing-out papers. The matt-surface papers are, as most admit, an undoubted gain to artistic working, but the ease with which a good print can be obtained from a wretched negative, when the *glacé* paper is employed, will always make it a favourite. For anything beyond work in miniature size, the glass-like surface of the print squeegeed upon glass or bright ebonite, is, to my mind, simply detestable; yet some of the public must like it, or the plan would not be adopted so widely.

I think the editorial leaderette upon formalin has not received the notice it undoubtedly deserves on account of the valuable properties this material evidently possesses in rendering fragile gelatinous surfaces insoluble and hard. Possibly Mr. F. H. Glew's interesting letter in the March 9 number of this JOURNAL will assist in drawing attention to a chemical of remarkable properties, which should be useful for dry plates also, especially in hot climates.

Another neglected but valuable aid to photographic work it is satisfactory to find coming to the fore a little. I refer to what was originally termed the Welbach light, but is now known simply as the incandescent gas light. Like many others, I tried it in the first and second stages of its manufacture, but found it impossible to prevent the "mantles" giving way so rapidly as to render the cost of the jet prohibitive. The last burners I employed are, I am happy to say, still in use, and still in good order. When thoroughly known, it will be a keen rival to the electric light for portraiture, as an installation need not cost above, say, twenty-five pounds, and it would be always ready for use, and needs no skilled attention or special attendant to keep it in proper working condition.

With regard to another illuminant recommended for portrait use, the Blitzpulver (Anglicè, "lightning powder"), the caution given by the editor in a recent JOURNAL is by no means uncalled for. Just as the danger always liable to be incurred in oxygen-making was entirely unknown to many who had made hundreds of feet at one time or another, so the still greater danger accompanying the use and storage of pyrotechnical compounds of the Blitzpulver type was entirely unknown to many. A timely caution may be given on this point. If a fire were to occur in any studio through the spontaneous combustion of this material, it is highly probable that the fire insurance companies would object or decline to make it good. Any one who has had experience in the manufacture of powders for coloured fires knows, or should know, their liability to spontaneously ignite, though it is true that the modern forms containing powdered shellac are less dangerous than the older forms still in use for many purposes; but, when it comes to a question of storing a mixture of picric acid or its compounds with so readily oxidisable a substance as magnesium powder, the man who would commit such an act can only be described as a lunatic, or worse.

In the "Correspondence" columns a week or two ago was a reply to one writing under the initials "H. T." asking for information as to the cause of his toning bath declining to tone, though he increased the quantity of gold eight fold. The Editor is quite right when he points out that, when chloride of gold is added to a bath and the latter used at once, it is likely to give mealy prints; but the description of the evil suggests more than anything that the writer has by some accident—splashes, or the use of unclean dishes—allowed a small quantity of hypo to contaminate his toning solution. Whenever this happens (and a drop of fixing solution in a gallon of "toning" will do the deed), it is impossible to get any proper toning from the bath. The remedy is simply to throw all the gold down, wash, and redissolve into chloride; nothing else will mend the solution.

Among recent novelties, the electric signal, described a short time ago in these pages, is a capital aid to the lecturer, but before he starts he should always ascertain that it is in working order, and provide himself also with a "clicker" in case of failure. Electrical appliances have a very unhappy trick of failing to act at the critical moment. I was at a lantern lecture the other day when the slides would not make their appearance at the proper moment. A home-made electric signal was in use. The lecturer had to call out to the lanternist, "Can you hear my signal?" "Not very well," was the reply. "Then I will use the clicker," said the lecturer; and the repetition of the click for each change was, in consequence, a continued source of amusement to the audience for the remainder of the entertainment.

The letter from Mr. W. B. Fergusson regarding the difficulties to be met, and how to encounter them successfully, by the camera-worker in Italy reminds me that, in the little work by Mr. G. Thompson, of Liverpool, on his Italian experiences, contains a most useful appendix on this particular point. His advice, too, is worth having, for he has tramped over a great deal of Southern Europe and Northern Africa with his camera, and, having met with all the usual troubles, knows how to circumvent the wily official, and he willingly gives of his store of knowledge to be utilised by others of less experience.

FREE LANCE.

AMERICAN NOTES AND NEWS.

The Law relative to Ownership of Negatives.—We learn from a Nebraska paper, the *Fremont Tribune*, that the Supreme Court has decided that, if any photographer shall sell any likeness without the personal or written consent of the one who sat for the portrait, such photographer will be subjected to a fine of not less than twenty dollars (4*l*.), or more than five hundred dollars (100*l*.). The language of the Supreme Court of the United States relative to the custody of the negative by the photographer is in substance this: Any person having a negative taken and ordering a dozen photographs from it, paying the regular price—say, $3·50 per dozen—afterwards, should he order a duplicate dozen which would cost him $2·50, the one dollar difference in cost between the first dozen and the duplicate dozen pays for the negative, which is the property of the person for whom it was made, but that the negative is held in trust by the photographer or his successors, unless he or they leave town, in which case the owner of the negative may demand and receive his property. The negative is held in trust by the photographer to protect him. It follows that no photographer is at liberty to sell a negative at any price which he has been paid for. It looks from this that it is compulsory that the photographer retain in safe keeping every negative from which a dozen prints have been made for the one ordering it, as the first price paid covers the cost of the negative. It is some consolation to know that the artist is not compelled to give it up unless he or his successors give up business in the town in which it was taken. Unless there is some limitation to the time, the negative must be kept in trust; this must prove a tax upon the photographer's powers of storage. And what if the negative should get damaged while in store?

Light and Shade in Portraits.—Among some questions hich were put at the fourth Annual Convention of the Photo-aphers' Association of Iowa, one was, "Why should not photo-aphs be made alike on both sides of the face? why should one side shaded and the other not? The majority of people don't want ie shade on one side." This was answered by three members as llows:—No. 1 said that it was a reproduction of nature to shade ie side when the light came only on one side. No. 2 said it took ght and shade to form a picture. No. 3 stated that he kept a mple of a picture without shade as an argument against such uestions as this. In this country we would point to the portraits f Queen Elizabeth, a strong-minded lady, who is reported not to ave allowed the artists who painted her portraits to put any shadow t all in her face. It was, however, quite open to some one to nswer the question in this manner: One side of the face is often laced in shadow, excessively deep shadow too, because it is con-entional and is imagined to be artistic, like an old picture, you now. Never mind whether it is natural or not, so long as it is hard nd patchy, Salonesque in short; it will be sure to find adorers. Mr. F. W. Medlar has been elected President of this Convention for he next year.

Change of Fashions in Photographic Portraiture.—Contrasting the changes of fashions in portraiture from the times of the *carte* mania, with its pillars and conventional posing chairs, seen nowhere but in a photographer's gallery, a writer in the *St. Louis and Canadian* hurls a mass of truths at the rage for accessories indulged in a few years ago. "At once it was considered good taste, as fashion always pretends to be, to introduce elegant accessories, and elaborately painted backgrounds of rather dark hues, in *quantum satis*, so that it took several minutes to find the portrait, and several more minutes to admire the accessories and background. This fashion reached its very height when the so-called Tadema picture came in vogue. They had to be made crossways on the plate in order the better to permit the introduction of more accessories." This is contrasted by the simplicity that characterises the more artistic productions of the present time. But we think that the writer is scarcely right in regard to the *raison-d'être* of the Tadema. It was made of that special form (the plate placed horizontally), not in order to get in more accessories, but more figures. The style was introduced nearly thirty years since by Angerer, of Vienna, by whom were taken some of the most charming family groups that have ever yet been produced. Several years afterwards a Brooklyn photographer applied the name Tadema to this style.

ON THE PRODUCT OF THE ACTION OF MERCURIC CHLORIDE UPON METALLIC SILVER.*

Action of Potassium Chloride.

The solution of potassium chloride was saturated in the cold, and the reaction went much as with ammonum chloride, but rather more readily in the cold. The heating and immediate removal of the solution was done as before. The figures obtained, expressed in atomic proportions, were:—

	Residue.	Solution.
Silver	1·006	1·994
Mercury	0·944	2·020

Another experiment gave very similar figures, and showed a rather greater transference of mercury from the residue to the solution, and of silver from the solution to the residue.

It is obvious that the reaction is of the same character as when ammonium chloride is used, but that less mercury is volatilised during the boilings; and it appears that a little of the mercury in the residue has precipitated silver from the solution. That metallic mercury does slowly dissolve and precipitate silver when it is allowed to act upon silver chloride dissolved in potassium chloride, was amply proved in a qualitative way.

* Concluded from page 89.

Action of Potassium Cyanide.

A five per cent. solution of crystallised potassium cyanide was employed. When poured upon the silver mercurous chloride, this produced an immediate blackening, and the reaction was therefore done in the cold. It was, however, necessary to persevere with several treatments to get a complete reaction, and, to prevent secondary changes as far as possible, the portions of solution first used, and containing the bulk of the dissolved metals, were poured off without delay. The residue consisted of metals in the free state, and the atomic proportions obtained were:—

	Residue.	Solution.
Silver	0·85	2·15
Mercury	1·07	1·92

The primary action is evidently similar to that of the previous cases, and may be expressed thus:—

$$3AgHgCl_2 + 8KCy =$$

$$Ag + Hg + 2KAgCy_2 + 2HgCy_2 + 6KCl$$

It would appear that a secondary reaction takes place between the metallic silver and the mercuric cyanide in the presence of alkaline cyanide, the silver precipitating the mercury and itself dissolving. The metals reacting in this case are in equivalent proportions. That metallic mercury is precipitated by metallic silver under these conditions was confirmed by qualitative experiments, and it was also shown that metallic mercury did not precipitate silver from a solution of silver chloride in potassium cyanide. In the presence of cyanide, therefore, the precipitation of one metal by the other is the reverse of that which takes place when potassium chloride is used as the solvent.

Action of Potassium Silver Cyanide.

The potassium silver cyanide was prepared by saturating a 2½ per cent. solution of potassium cyanide with precipitated silver cyanide. This reagent produced a deep black colour immediately on coming into contact with the silver mercurous chloride. The reaction was therefore done in the cold, taking the same precautions as before to prevent secondary reactions as far as possible, and finally the residue was ground with the solution to perfect the change. It was found, by preliminary qualitative experiments, that the greater part of the mercury dissolved, and that the residue consisted of metallic silver, metallic mercury, silver chloride, and silver cyanide. The following percentage figures give the analytical results obtained:—

	Residue.				Solution.
	Hg (sol. in HNO_3).	Ag (Metal).	Ag as AgCl.	Ag as AgCy.	Mercury.
1	...	Not	estimated.	...	37·94
2	12·57	28·35	24·53	6·69	40·56
3	10·61	27·56	20·99	14·64	Not estimated.

After the second experiment I was puzzled to account for the consider able amount of mercury in the residue, because, as the whole of the silver of the silver mercurous chloride appeared in the metallic condition, it seemed impossible that there should be any metallic mercury. But in the nitric acid solution of the silver and mercury I noticed hydrocyanic acid by its smell, and confirmed its presence by the Prussian-blue test.

In the third experiment more than six times the theoretical quantity of the reagent was used, and every precaution was taken to ensure a complete reaction. The washing was continued until all traces of soluble silver salts were removed, and it was found on continuing the washing that mercury was slowly dissolved from the residue, and that this mercury was associated with hydrocyanic acid. The washing with water was continued until practically no more mercury could be got away, and

6·87 of the 10·61 per cent. was thus removed, leaving 3·74 per cent. still in the residue. The latter quantity was dissolved out in nitric acid with the metallic silver. The mercury in the residue bears the same proportion to the silver chloride in both cases, the ratio being one molecule of silver chloride to 0·276 atom of mercury in the second experiment, and 0·273 in the third.

It appears therefore that the primary change may be expressed by the following equation :—

$$HgAgCl_2 + KAgCy_2 = Ag + AgCl + HgCy_2 + KCl$$

Some of the mercury cyanide appears to be held in the residue by the silver chloride so tenaciously that prolonged washing with water removed only a part, and that slowly. It is known that silver chloride takes up mercuric chloride, and this may be an analogous effect; but in a few experiments that naturally suggested themselves I have not been able to induce silver chloride to take up or combine with mercury cyanide and hold it with anything like the tenacity shown in the reaction under discussion.

The appearance of silver cyanide in the residue is easily accounted for We know that silver chloride is quickly changed to cyanide by a solution of potassium cyanide and then dissolved, and I find potassium silver cyanide has the same effect except the solution of the silver cyanide, which obviously is impossible. The reaction—

$$AgCl + KAgCy_2 = KCl + 2AgCy$$

takes place readily, and a double proportion of silver cyanide is precipitated. By adding to the silver found as chloride half the silver found as cyanide in the residue, we get in the second experiment 27·87, and in the third 28·31 instead of the theoretical 28·5.

Comparing the second and third experiments, we see the effect of the rather longer action of the reagent in the last case in the greater amount of silver chloride changed into cyanide and in the slight deficiency of the metallic silver in the residue. It is probable that finely divided metallic silver has a tendency to dissolve in a solution of potassium silver cyanide.

I thought at first that it must be impossible for mercury cyanide and metallic silver to be dissolved in nitric acid without the hydrocyanic acid, which was perceptible to the smell, precipitating the silver; but I find that silver nitrate added to a solution of mercuric cyanide very tardily gives a precipitate, and that the precipitate is dissolved on adding a little dilute nitric acid.

Action of Ammonia.

When dilute aqueous ammonia is poured upon silver mercurous chloride the solid is changed immediately to a fine black colour, which, however, is modified to a brownish or slaty tint by washing and drying. I have analysed the products of five reactions and find that the residue contains silver, mercury, chlorine, and nitrogen, and that the solution contains silver, a little mercury, which appears to increase as the action of the ammonia is prolonged, and chlorine. My results seem to indicate that probably two doubly substituted ammonium chlorides are formed, namely, $NH_2AgHgCl$ and $NHAgHg_2Cl$ in varying quantities, silver chloride dissolving, and that secondary reactions also take place. I will postpone further notice of the action of ammonia until my results have shown more definitely the changes that take place.

Action of Caustic Soda.

Mercurous chloride is readily decomposed by warming it with caustic soda solution, the whole of the chlorine being taken up by the soda. Silver chloride is tardily decomposed, especially if it has been dried, indeed it is stated that cold caustic soda is without action on dried silver chloride. As in silver mercurous chloride we undoubtedly have chlorine joined to silver, it was anticipated that the total removal of chlorine would be difficult.

A two per cent. solution of pure caustic soda was used. The salt immediately blackened in contact with it. The black products remaining gave the following qualitative reactions. Dilute nitric acid dissolved the greater part, leaving silver chloride behind, and the metals were completely precipitated from the solution on adding hydrochloric acid, showing that the mercury was not oxidised to the mercuric condition. Concentrated hydrochloric acid restored the original white colour and then darkened the compound, as is shown below in the section on the "action of hydrochloric acid." On heating in a bulb-tube oxygen was given off, mercury sublimed, and a residue of metallic silver and silver chloride was left.

It was found that whether the soda solution was used hot or cold made little difference to the completeness of the reaction. The chlorine came away easily at first, then more slowly, and it was found impossible to go on until chlorine ceased to come away without repeating the treatment with soda so often that the bulk of solution would be very great. I do not know whether complete decomposition would be finally possible, but collateral evidence indicates that probably it would. One of the residues obtained in this manner, when dried over sulphuric acid, amounted to 86·60 per cent. of the silver mercurous chloride taken, and an estimation of the metals and chlorine gave results agreeing with the composition—

Mercurous oxide	52·94
Silver oxide	18·92
Silver chloride	14·47
	86·33

A little of the mercury is dissolved by the soda. In this experiment 1·8 of the 52·7 per cent. present in the original substance, and in another experiment in which the soda solution was heated and the action more prolonged, a greater quantity—4·5 per cent.—was dissolved. This partial solution of the mercurous oxide in the alkali does not, however, appear to be due to the caustic soda, but to the sodium carbonate present in it or formed by exposure to the air during the reaction.

It, would, of course, be possible to express the results of the analysis in terms of silver mercurous oxide and unchanged silver mercurous chloride, or silver mercurous oxychloride and silver mercurous oxide.

Action of Sodium Carbonate.

This reagent appears to act upon silver mercurous chloride rather more readily than if the two chlorides were uncombined. A cold solution changes the salt to an olive-green colour with a little yellow about it, and then to a slate colour. The solution obtained contains mercury and no silver, and dilute nitric acid dissolves out from the residue both silver and mercury, which metals are completely precipitated from the solution by hydrochloric acid, showing that the mercury remains in the mercurous condition. Sodium carbonate solution has scarcely any action upon silver chloride alone.

Action of Hydrochloric Acid.

It is not safe to allow even cold dilute hydrochloric acid to come into contact with silver mercurous chloride, as it leads to a loss of mercury. Strong hydrochloric acid does not darken the salt so readily as the alkaline chlorides do, but, on boiling a few times with fresh quantities, a globule of metallic mercury is obtained as residue. The results of one operation are given in the following figures, which express the quantities obtained from 100 parts of the salt :—

Residue.		Solution.	
Hg.	Ag.	Hg.	Ag.
24·57	0·26	24·85	28·05

The silver was in solution as silver chloride, and the bulk of it was precipitated on cooling and diluting. It is obvious that the mercury is equally divided, that there is a little loss of mercury from both the residue and solution by volatilisation during the boiling, and that, practically, all the silver dissolves as silver chloride.

The primary reaction is therefore—

$$2AgHgCl_2 = Hg + HgCl_2 + 2AgCl.$$

Doubtless the silver in the residue was precipitated from solution by the metallic mercury.

Action of Ferrous Oxalate.

A solution of ferrous oxalate in potassium oxalate readily reduces either mercurous chloride or silver chloride alone, and also silver mercurous chloride, to the metallic state, the whole of the chlorine being removed and the whole of the metals remaining in the residue. Ferrous citrate was found to have no visible effect upon silver mercurous chloride after contact with it for several minutes, but immediately a little potassium oxalate was added reduction began.

Action of Sodium Sulphite.

In the investigation of this reaction, my colleague, Mr. Kirman, has worked with me, and I desire here to express my thanks to him for his assistance.

Divers and Shimidzu (C.S.J., xlix., 544, 569, 572) state that when sodium sulphite solution acts upon mercurous chloride, black "hypomercurosic sulphite," "$Hg(SO_3)_2Hg_3$" is formed, but that this is so acted rapidly upon by the excess of sodium sulphite, forming mercuric sodium sulphite in solution and precipitating half the mercury in the metallic state,

that it is hardly possible to do more than just to see that the sulphite has a blackening action. The final change may therefore be written—

$$2HgCl + 2Na_2SO_3 = HgNa_2(SO_3)_2 + Hg + 2NaCl.$$

We have confirmed this reaction, showing quantitatively that half the mercury passes into solution and half is precipitated as metal, and also that the sodium contains mercuric sodium sulphite by precipitating it with a strong solution of sodium sulphite and identifying it qualitatively.

Concerning the action of sodium sulphite on silver chloride, the latter is dissolved presumably with the formation of a double sulphite of silver and sodium, but we have not been able to fix any formula for this double sulphite; indeed, the proportion of sodium sulphite necessary to hold silver in solution appears to be affected by temperature, by dilution, and by the presence of other compounds, such as chlorides. By adding a standard solution of silver nitrate to a solution of sodium sulphite until a permanent precipitate begins to be produced, we find that each atom of silver requires 2·24 molecules of sodium sulphite when this latter is dissolved in water in the proportion of 1 grm. to 80 c.c., and the experiment is done at the ordinary temperature. With a stronger or weaker solution, or if the test is done at a higher or lower temperature, the sulphite required for each atom of silver soon rises to 2·85 to 3 molecules. By adding a little sodium chloride to any of these solutions saturated with silver sulphite, silver chloride at once precipitates; therefore, by using silver chloride instead of silver nitrate, a still greater proportion of sodium sulphite must be necessary, and this we find to be the case. An excess of precipitated silver chloride was digested in the cold for a day or two with a solution of sodium sulphite, and it was found that for each atom of silver dissolved there were 3·97 molecules of sulphite present. In other experiments it was found that digestion for five hours or for six days gave a higher proportion. Three molecules of sodium sulphite were found sufficient to dissolve one molecule of precipitated and washed silver sulphite. Prolonged digestion is not advisable in these experiments, as even at ordinary temperature there is a tendency for the silver sulphite in these saturated solutions to decompose, depositing its metal.

A cold solution of sodium sulphite at once darkens silver mercurous chloride. By grinding the salt in the solution, a turbidity which looks as if it were due to silver chloride makes its appearance; this dissolves, and the residue shrinks together as the reaction is completed. One experiment gave the following atomic proportions:—

	Residue.	Solution.
Silver	1·89	2·11
Mercury	0·98	3·00

The atomic proportion of silver in the residue, taking the mercury as unity, was found in three other reactions to be 2·02, 1·99, 1·90. There is no doubt, therefore, that the residue consists normally of silver and mercury in the proportion of two atoms to one. The mercury in the solution was proved to be present as mercuric sodium sulphite by precipitating this salt with excess of sodium sulphite, and by the precipitation of mercury when its solution was heated. Therefore the decomposition of the silver mercurous chloride may be represented by the equation—

$$4AgHgCl_2 = Ag_2 + Hg + 2AgCl + 3HgCl_2$$

and, as the mercury and silver dissolved are changed into sulphites, as stated above, the full equation may be written—

$$4AgHgCl_2 + 7Na_2SO_3 + xNa_2SO_3 =$$

$$Ag_2 + Hg + Ag_2SO_3, xNa_2SO_3 + 3HgNa_2(SO_3)_2 + 8NaCl$$

the x being equal to about seven.

By mixing the sodium sulphite solution and silver mercurous chloride in a tube that is afterwards sealed and allowed to stand for a few days so that the products of the action have time to react among themselves, we find that the metallic mercury of the residue precipitates silver from the solution, the mercury dissolving. In two experiments the silver in the residue was increased from 14·25 per cent., the amount required for the change as represented above, to 26·4 per cent., and 27·5 per cent. respectively. The mercury dissolving is not equivalent to the silver precipitated, and the proportion of it is very discrepant; indeed, while in two experiments the residual mercury had considerably decreased, in another it had apparently increased. This irregularity, however, is only what was to have been expected, especially when the sodium sulphite was not in very large excess, because of the well-known tendency of both silver and mercury sulphites to decompose in the presence of water giving sulphuric acid and the metal.

Action of Sodium Thiosulphate.

A ten per cent. solution of sodium thiosulphate was employed, which had a scarcely perceptible acid reaction. Unless care was taken to add a considerable excess to the silver mercurous chloride, sulphide of mercury was precipitated, and the consequent production of sulphuric acid caused a gradual and considerable precipitation of sulphur. But, by arranging so that the salt never comes into contact with less than a sufficient excess of alkaline thiosulphate, the decomposition of the thiosulphates is so far prevented that there is a mere trace of sulphide in the residue, and the acidity of the solution is not great enough to affect litmus paper. An experiment done under these conditions gave the following atomic proportions of the metals:—

	Residue.	Solution.
Silver	1·18	1·83
Mercury	0·79	2·22

These figures indicate that the primary change of the silver mercurous chloride may be expressed thus:—

$$3HgAgCl_2 = Ag + Hg + 2AgCl + 2HgCl_2$$

and that some of the metallic mercury of the residue then precipitates some of the silver from the solution. I find that mercury readily precipitates silver from a solution of silver chloride in sodium thiosulphate, and that silver has no effect upon a solution of mercuric chloride mixed with excess of sodium thiosulphate. It will be noticed that the excess of metallic silver in the residue falls short of the amount equivalent to the excess of mercury in the solution. This, I think, is probably due to the solution of some of the silver in the thiosulphate solution, the silver perhaps becoming soluble by aerial oxidation. The full equation, showing the action of sodium thiosulphate, may be written thus:—

$$3HgAgCl_2 + 9Na_2S_2O_3 = Ag + Hg + Ag_2S_2O_3, 2Na_2S_2O_3 + 2[HgS_2O_3, 2Na_2SO_3] + 6NaCl$$

It is necessary to observe that the composition of the double thiosulphate of mercury and sodium does not appear to have been determined, and the above formula is given because it appears to be the rule for sodium thiosulphate to combine with heavy metal thiosulphates in this proportion when soluble compounds are formed.

It is stated by some authorities that sodium thiosulphate dissolves mercurous chloride, but I do not find that anomalous action to take place. It appears that half the mercury dissolves, and that the other half remains as metal if enough thiosulphate is used to prevent secondary reactions.

Conclusion.

We may summarily compare the primary effects of the reagents examined upon silver mercurous chloride by stating that hydrochloric acid, ferrous oxalate, caustic soda, and sodium carbonate act as we should expect them to do if the silver chloride and mercurous chloride were separate from and independent of each other. Hydrochloric acid dissolves the silver chloride and breaks up the mercurous chloride into mercuric chloride and mercury, ferrous oxalate gives complete reduction to the metallic state, and the alkalies act by partially exchanging chlorine for oxygen. But the reactions produced with the other substances are not merely the added changes they would give with the two separate chlorides. Ammonium chloride, potassium chloride, potassium cyanide, and sodium thiosulphate act similarly in leaving one-third of each metal as residue in the metallic state, and dissolving the remainder. Sodium sulphite leaves half the silver and one-third of the mercury as metals, dissolving the rest, and potassium silver cyanide leaves all the silver as metal. Ammonia produces substituted ammonium salts containing both mercury and silver.

Of the four reagents that act as they would if the silver and mercurous chloride were not combined, but only mixed, it is obvious that ferrous oxalate giving complete reduction must do so, and this leaves only the action of the acid and the alkali upon which to found an argument against the suggestion that the body is a double chloride and not a mere mixture. I think, therefore, it must be admitted, as formulæ only express reactions, or at least must do this before they can do anything else.

that the product of the action of mercuric chloride upon metallic silver s most advantageously considered to be a double chloride.

It is not difficult to write down the possible ways in which silver mercurous chloride may break up, leaving metals and fully saturated chlorides only:—

$$HgAgCl_2 = Ag + + + HgCl_2$$
$$2HgAgCl_2 = + Hg + 2AgCl + HgCl_2$$
$$3HgAgCl_2 = Ag + Hg + 2AgCl + 2HgCl_2$$
$$4HgAgCl_2 = 2Ag + Hg + 2AgCl + 3HgCl_2$$
$$5HgAgCl_2 = Ag + 2Hg + 4AgCl + 3HgCl_2$$
$$\text{or } 3Ag + Hg + 2AgCl + 4HgCl_2$$
$$6HgAgCl_2 = 4Ag + Hg + 2AgCl + 5HgCl_2$$

and by taking seven molecules we can add three equations; by taking eight, two more; and so on.

It is interesting to note that of these changes the first is realised by silver potassium cyanide, the second by hydrochloric acid, the third by the alkaline chlorides, potassium cyanide, and sodium thiosulphate, and the fourth by sodium sulphite. I have not found any reagent that induces the decomposition indicated by the equations where five or more molecules of silver mercurous cyanide are necessary to react together.

Mercuric chloride readily reacts upon the mixed (or combined?) metals left as residues, and it is so possible to produce double chlorides, or mixtures of the two chlorides containing mercury and silver in other ratios than an equal number of atoms. If, for instance, we take the mercury and silver left by the action of ferrous oxalate upon silver mercurous chloride, and treat it with mercuric chloride, we should expect to get—

$$HgAg + 2HgCl_2 = Hg_3AgCl_4$$

and I have established the fact that mercuric chloride does act upon some of these metallic residues in this manner. Whether this product, taken as an example, would be merely a mixture of silver mercurous chloride and mercurous chloride, $AgHgCl_2 + 2HgCl$, is a question that I hope to be able to answer in due time.

When mercuric chloride acts upon such metallic residues, and also, I believe, when it acts upon silver itself, a black compound appears to be first produced. This also needs investigation. CHAPMAN JONES.

LORD RAYLEIGH ON CURIOSITIES OF COLOUR.

LORD RAYLEIGH gave his concluding lecture on the optical discoveries of Newton at the Royal Institution on Saturday afternoon. He dealt mainly with the effect of colours upon the eye, pointing out in the first instance that that organ is sensitive to the rays of the spectrum in quite a different way from, say, a thermometer, which is only sensitive to one quality. From our ordinary every-day notions we conceive of colour in at least three aspects, namely its hue, its tint, and its brightness. The hue of a colour is one thing and its tint another. Thus reds may be alike in hue, but vary in tint and in brightness. The variations of tint depend upon how much white is mixed up with the particular hue. A deep tint means a small admixture of white, a faint tint a large admixture. Then, the appearance of the mixture may vary in brightness. In other words, according to the total quantity of it on a given surface. A very bright or strong colour means one in which there is plenty of the colour light, but if the light is small in quantity we call it a dark colour.

To illustrate these ideas more clearly, Lord Rayleigh used rapidly revolving discs of coloured cardboard. By taking a full red hue in the shape of a crimson disc and introducing into it a segment of white we get a pink tint when the whole is rapidly revolved, so as to mix the red and white together; the more white introduced, the lighter the tint. By introducing a black segment into the disc we reduce the total quantity of coloured rays, and get a darker instead of a brighter hue, black, of course, being no colour at all—the negation of hue. Lord Rayleigh described Newton's method of determining the resultant of a given combination of colours by imagining their proportions as so many weights placed at different points round a circle corresponding to the positions of the colours in the spectrum. The resultant colour is represented by the position of the centre of gravity of the weights. This has since proved not to be correct. The true diagram should be a triangle with blue at the apex and red and green at the two base corners, the other colours being intermediary on the side lines between green and blue or green and red. This rule implies the threefold character of colour, but Lord Rayleigh pointed out that it is contradictory to many popularly received notions—for instance, that yellow is a primary colour. Pure green and red light were mixed in the lantern and were shown to produce a bright yellow. Some of Captain Abney's recent investigations into the accurate definition of hue and tint were described, the lecturer remarking that there ought now to be no difficulty in ordering an exact shade in coloured silk by telegraph.

Proceeding further with revolving disc experiments in mixing colours, the lecturer pointed out that blue and yellow do not make green, as popularly believed, but a pinkish grey, which is practically identical with a mixture of black and white, with which a minute dash of red is associated. With any five discs including black and white a match can be made. Lord Rayleigh pointed out some tables of such combinations. Thus 100 parts of blue, fifty of white, and forty-two of red produce the same colour as sixty-four parts of yellow and 128 of blue. Again, 135 parts of black, twenty-one of white, and thirty-six of yellow equal 123 of red and sixty-nine of green. Why has colour a threefold characteristic? The explanation offered by theory of Young and Helmholtz is that there are three different sets of perceptive nerves associated with the eye. There are difficulties, however, not readily got over. Some of these are suggested by cases of colour-blindness in which vision is monochromatic—that is, all objects are the same hue, the only difference being varying brightness. The Committee on Colour Vision, on which Lord Rayleigh served, discovered a young woman who was colour-blind in one eye alone, the other being quite normal. Assuming that the nerves sensitive to green or blue were disorganized or inoperative in a colour-blind person, he or she would see everything red, and yet know nothing of this abnormality or be able to explain anything of the symptoms. All this looks to Lord Rayleigh as if the sensory perceptive centres that had to do with light are much more complex than supposed by the Young-Helmholtz theory.

The lecturer mentioned some of his experiences in connexion with the Colour Vision Committee. The common confusion is between red and green. A colour-blind relative of Lord Rayleigh's was extremely particular in making a match between some compound shades. When he had settled it to his complete satisfaction, the colours turned out to be a deep crimson and a dark green.

PHOTOGRAPHIC CHEMICALS: HOW TO PREPARE THEM, AND HOW TO TEST THEIR PURITY.*

WE now continue with sodium acetate, much used in the toning bath. This salt occurs in small transparent crystals, and can be easily prepared by the following process:—Acetic acid is added to carbonate of sodium until effervescence ceases and the solution is quite neutral; a little of the mixture should be boiled in a test tube to expel carbonic acid, and a slip of blue litmus paper immersed; if it turns red it is acid, and should be further neutralised with soda. The solution is then filtered and evaporated down to crystallise. The impurity may be either from an impure carbonate of soda or acetic acid used in its manufacture; acetic acid may contain hydrochloric, sulphuric, or nitric acid. HCl, or chloride, is detected by giving a white precipitate with a solution of silver nitrate; sulphuric acid or sulphates, by giving a white precipitate with barium nitrate. Acetate of sodium, when treated with strong sulphuric acid and heated in a test tube, evolves acetic acid, which is easily detected by its vinegar-like smell; another test for acetates is that a neutral solution gives with ferric chloride a red liquid, which is bleached by the addition of HCl. For toning purposes it should be free from chloride, therefore have recourse to the silver nitrate test. For acetic acid or vinegar the above tests would equally apply.

Caustic soda will be our next. This is an important article to the photographer, who uses it in alkaline development. It is very easily prepared by gradually adding twelve ounces of slaked lime to twenty-eight ounces of crystals of carbonate of sodium dissolved in one gallon of water. The mixture is then heated to its boiling point for ten minutes, allowing the precipitate, which is carbonate of calcium, to subside, and the clear solution is syphoned off. This solution will contain about eighteen to twenty grains of caustic soda to each fluid ounce. If wanted in sticks or cakes, the solution is boiled down rapidly in a clean silver vessel, until a drop taken out on a glass rod solidifies on cooling; it is then poured into suitable vessels, and when solidified, and while still warm, it is put away in stoppered bottles.

The impurities which are generally present may be either chlorides, which exist as impurities in the carbonate of sodium used, or alumina, which exists in the lime. Caustic potash is prepared in the same manner, substituting carbonate of potash for the carbonate of soda.

The tests for chloride present would be exactly as in the cases of carbonate of soda. Whenever you wish to test for chlorides, use the silver nitrate reagent, but when you are testing an alkali always acidify with HNO_3 before adding your silver nitrate.

Continuing still with preparations of soda, we next turn to sodium sulphite or sulphite of soda. This occurs in prismatic crystals which effloresce, that is, of mixing water of crystallisation. Be it understood that no crystals are formed without water; some contain a very large proportion of water. Alum, for instance, contains nearly half its weight of water, making it so useful in the lining of iron safes; when a fire occurs, the safe is kept cool by the alum being heated and giving up its water of crystallisation. Sodium sulphite is prepared by passing sulphur dioxide SO_2, formed when sulphur is burned in air, over moist crystals of carbonate of soda, when sodium sulphite is formed, and carbonic

* Concluded from page 169.

dioxide is liberated; or it may be prepared by the amateur on a small scale by dissolving carbonate of soda in water, dividing the solution in two parts, passing sulphur dioxide through one portion until effervescence ceases, then mixing with the other half. The reason for this is that sodium bisulphite or acid sulphite is first formed, and, by the addition of the two portions, it is converted into the normal sulphite.

It is very soluble in cold water, and in half its weight of hot water.

In testing for impurities, observe its characters. If a portion of the crystals has turned white like flour, it has probably been oxidised by the action of the air, which would convert it into a sulphate of sodium.

Make a solution of the salt in water, now add your reagent, barium nitrate, when a heavy white precipitate will be thrown down if sulphates are present. The crystals should not smell of sulphur dioxide, which has a very disagreeable odour, denoting absence of bisulphite of sodium. An aqueous solution, that is, a portion dissolved in water, should be slightly alkaline; if strongly so, which could be ascertained by the solution turning a slip of red litmus paper a bright blue, carbonate of sodium, from which it is prepared, is probably present, and is detected by the effervescence produced, when a portion of the crushed salt is mixed with a strong solution of citric or tartaric acid. Sodium sulphite is employed as a pyro preservative and in mercurial intensification, and it may be employed as a fixing agent for silver prints. It will not keep long in solution; it should be made fresh as required.

From sodium sulphite we turn to sodium thiosulphate, commonly called hypo. This is a preparation that will not pay the amateur to make, on account of its cheapness and difficulty in making, although it can be made by passing sulphur dioxide into a mixed solution of sulphide of sodium and caustic soda. It is made on a large scale from what is known in the trade as tank waste, a residue of calcium sulphide, left as a bye-product in the manufacture of carbonate of soda. The tank waste, in small lumps, is exposed to the atmosphere for several months under cover, when it becomes oxidised to calcium thiosulphate and calcium hydrate. On treating the mass, after exposure for the above time, with water, the thiosulphate dissolves out, which forms a solution of thiosulphate of calcium; to this is added sulphate of soda; when the calcium, or lime, is precipitated, sodium thiosulphate or hypo remains in solution. On a small scale it can be prepared by passing sulphurous acid gas through a solution of carbonate of soda until effervescence ceases, and then boiling the solution with an excess of powdered sulphur. Hypo occurs in irregular crystalline masses, and if pure should not effloresce. It is extremely soluble in water. The solution does not keep long unless a sufficient quantity of Na_2Co_3 be added to render it neutral, when it will keep for some considerable time. Ammonia is also recommended to be added to a solution of hypo when used as a fixing agent for silver prints. Hypo is very liable to contain sodium sulphate as an impurity. To test for this, make a solution and add an excess of HCl, which will precipitate sulphur. The solution is then filtered, and to the clear liquid barium nitrate is added, when a white precipitate is thrown down if any sulphate is present, which can often be detected by the edges of the hypo becoming white when exposed to the air. It will, perhaps, be not out of place to say here that, when hypo is used as a fixing bath for silver prints, every trace must be removed by washing with clean water, otherwise the best of prints will fade or become yellow. Some very delicate tests can be applied to prove whether any portion remains in the washing. For instance, a solution of mercuric chloride or corrosive sublimate becomes milky with even a trace of hypo. Minute quantities of the salt may also be detected by adding a drop of a solution of permanganate of potassium, the beautiful pink colour of which will instantly vanish if any hypo is present. Hypo eliminators are not recommended; although they remove the last traces of hypo, yet probably they leave behind products of decomposition which are less soluble than the hypo itself. Peroxide of hydrogen, iodine, and other substances have been recommended as eliminators.

We continue with another preparation of sodium—oxalate of sodium—which is employed in the printing-out platinotype paper. The salt occurs in fine glistening needle-shaped crystals; it is very easily prepared by neutralising oxalic acid with carbonate of sodium and evaporating to dryness. It is soluble in thirty-six times its weight of cold water and twice its weight of hot. This must not be confounded with neutral oxalate, which is employed in making potassium ferrous oxalate and for developing platinotype. The salt occurs in white opaque crystalline masses or in powder. It is prepared on a small scale by neutralising carbonate of potassium with oxalic acid; thus, dissolve 15 ounces potassium carbonate in 30 ounces H_2O, and place the solution in a large jar or basin, and add to it 10 ounces oxalic acid in small quantities at a time, and stirring well with a glass rod after each addition of acid. When all the oxalic has been added, test the solution with phenol phthalen, or, if you boil the solution with litmus and add acid or soda, as the case may require, to render it neutral, if required in crystalline form, evaporate the solution down to dryness; or it can be diluted down with water until it measures 3 pints 8 ounces, when it will contain about 25 per cent. of neutral oxalate of potassium in solution. The crystals are soluble in three times their weight of water, which will distinguish it from binoxalate of potassium, salts of sorrel, which is sometimes sold in mistake for the neutral oxalate. Binoxalate is soluble in about one in forty against the more soluble oxalate. Salts of sorrel can, however, be converted into the neutral oxalate by the simple addition of carbonate of potassium until quite neutral. In testing for impurities, oxalate of sodium should be searched for. This is easily detected by moistening some of the salt with H_2SO_4 and evaporating in an open dish to complete dryness, gently igniting until all fumes cease. The mass is then treated with HCl. A piece of platinum wire dipped into the mixture and held in a Bunsen flame or the flame of a spirit lamp will give a very yellow flame if sodium is present.

As carbonate of potassium is often used in photography, and used for making many other chemicals, it will prove interesting to hear how that substance is obtained. It is prepared commercially either from plant ashes or carnalite, &c. Plants contain potassium as sulphate and chlorides, &c., in combination with oxalic, tartaric, and other vegetable acids. The plant is burned, and the inorganic salts remain unchanged, and the organic, tartaric, malic, &c., become converted into carbonate of potassium. The burnt mass or ashes are treated with water and a little lime, the solution is filtered and evaporated to dryness; this is generally called potashes. Pearlash, which is an impure carbonate of potassium, is made from potashes, by calcining it to remove tarry matters. The calcined residue is redissolved in water and recrystallised. The manufacture of potassium carbonate from wood ashes is carried out in many countries, such as America, France, &c. It is also obtained as a bye-product in the manufacture of sugar from beetroot; the residue left, which is sulphate of potassium, is mixed with chalk, the sulphate of potassium is converted into carbonate, and the chalk into sulphate of lime, which is precipitated, being insoluble. The carbonate of potassium which remains in solution is evaporated down to form the solid salt. If you should be hard up at any time for K_2CO_3, it can be easily prepared by calcining cream of tartar, which is tartrate of potassium. The salt, when strongly heated, is decomposed into potassium carbonate and other substances, the black residue obtained is boiled with water, and the solution, after being filtered, is evaporated down to dryness, when you have potassium carbonate.

The impurities found in K_2CO_2 are sulphates and chlorides, which are detected by the barium nitrate of silver nitrate tests, as before explained.

Potassium Metabisulphite.

This salt occurs in well-formed transparent needle-shaped crystals, with a peculiar and rather unpleasant odour of SO_2; it is insoluble in alcohol, but soluble in three times its weight of H_2O. It is prepared by passing sulphurous acid gas into a strong solution of potassium carbonate, then adding absolute alcohol to the liquid, when the metabisulphite will separate out in fine crystals. The test in this case will be for sulphates, which can be detected by adding an excess of HCl. If it is pure, only a faint spot will be seen by the addition of $BaCl_2$; if a heavy white spot is thrown down, it contains sulphates, and should be discarded. Metabisulphite is employed for the same purpose as sodium sulphite, as a preservative of pyro in place of HNO_3, also eikonogen, quinol, &c.

Silver nitrate is an important chemical, and one that is much adulterated. It is easily made, and those who have old silver spoons or snuff boxes can convert them into $AgNO_3$ by the following process:—Take three ounces of pure silver and place it in a glass flask, and two measured ounces of HNO_3, apply a gentle heat, and in a short time the silver will dissolve. The solution is now evaporated to dryness, and, gently heating the residues to expel any excess of acid, the mass is then dissolved in the smallest quantity of water, filtering if necessary, and recrystallised. Silver contained can be easily converted into the pure nitrate by dissolving the metal in HNO_2 as before. Nitrate of silver and copper will this time be formed, which is a green substance. This compound is gently heated in a crucible, and the $Cu(NO_3)$ is converted into an oxide. The silver nitrate which remains unaffected can be dissolved out with water. To examine a sample of $AgNO_3$, make a solution with aq. dist., and test with blue litmus paper; if pure, it should be only faintly acid. Foreign samples are, as a rule, very acid. Again, to a portion of the solution add drop by drop of HCl till the Ag is precipitated as chloride, now evaporate the filtrate to dryness. If pure, no precipitate will be left; if, however, there should be any residue, ignite it, and, if it gives off white fumes, it will indicate ammonia nitrate as an impurity. Treat the residue with water; should there be any after ignition, test the soluble portion for K I, &c., the former giving a lemon colour, and the latter a yellow to a Bunsen flame. If there is any insoluble portion, it may be had as an impurity, or this can be dissolved in HNO_3, and tested with H_3S, when, if Pb is present, it will turn black.

Ammonia being very often used in the development of plates in conjunction with pyro to render it alkaline, and to enhance its deoxidising power, it will be interesting to know of its chemical composition. N and H form only one compound, viz., ammonia. These elements do not very readily unite when brought together alone, but under certain circumstances, especially when water is evaporated, the N of the air then combines with the elements of water, which are H and O, forming small quantities of ammonium nitrate. Ammonia is chiefly obtained from the decomposition of animal and vegetable matter, containing N and H., being formed either gradually at the ordinary temperature, or quickly under the influence of heat. Thus, when horns, clippings of hides, or coal is heated, ammonia is given off; hence ammonia was known as spirits of hartshorn; the name Ammonia is derived from the fact that a

compound containing ammonium, called Sal Ammoniac, was first prepared by the Arabs in the deserts of Libya, near the temple of Jupiter Ammon, by heating camels' dung, guano, the dried excrement of seabirds; and the urine of animals likewise contains large quantities of ammonia, and its compounds now, however, are mainly obtained from the ammoniacal liquors of the gas works. Coal contains about two per cent. of it. When the coal is heated, this mostly comes off in combination with H of the coal as ammonium. To this gas water HCl is added, which forms NH_4Cl. of commerce. To prepare ammonia for your own use, it is best prepared by heating one part of NH_4Cl with two parts quicklime. Ammoniacal gas is liberated, which is then passed into water, which retains it in solution on exposure to a pressure of seven atmospheres; ammonia gas is condensed to a colourless liquid; this, if cooled to a certain temperature, freezes to a transparent solid. Condensed ammonia gas is employed by some manufacturers of dry plates and of sensitised paper for refrigerating purposes.

Tests—Ammonia may contain carbonic acid, which can be detected by rendering lime water milky; also it may contain chlorides and sulphates, which can be detected by the $BaCl_2$ and $AgNO_2$ tests. Ammonia must be kept in dark blue bottles, not white glass, which contains lead. Ammonia absorbs lead from the glass, and so becomes impure; if lead is present, it will give a black precipitate with H_2S.

Hydroquinone or quinol. This substance occurs as a nearly white crystalline powder, having a sweetish taste, soluble in water and alcohol. It is prepared by gradually adding five parts of finely powdered potassium bichromate to two parts of aniline, dissolved in a mixture of H_2SO_4 and water, sixteen parts H_2SO_4, sixty parts H_2O. Many chemical changes occur, and a brown liquid is formed; sodium sulphite is next added, until the colour nearly disappears; the mixture is then shaken up with ether, which dissolves out the hydroquinone; the ether is evaporated off, and the powder recovered. Hydroquinone dissolved in water gives a green colour with ferric chloride, and a deep red with ammonia. These reactions distinguish it from catechol and resorcin, the former a bye-product in the manufacture of hydroquinone, which is turned brown with ammonia. Resorcin gives a violet colour with ferric chloride.

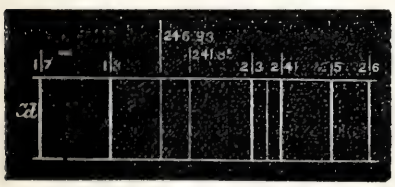
R. H. Richards.

ON THE PHOTOGRAPHY OF THE LUMINOUS RAYS OF THE SHORTEST WAVE-LENGTHS.*

I obtained still stronger films in a similar manner, but with the difference that I removed them from the plate after drying; and, as they were not quite uniform among themselves, I sought them out of a suitable thickness with the aid of the above-mentioned micrometer; cut them in slips of 0·5 mm. in width, and fixed these slips in series, according to their thickness, across the slit—5 mm. long and 1 mm. wide—of a small opaque screen, and at a mutual distance of 1 mm. In this manner there was formed a grating serving as a filter for the rays, the rods of which had the thickness of 0·13, 0·07, 0·058, 0·04, 0·03, 0·02, 0·01. When I covered the slit with this grating, each exposure gave seven different absorption spectra, separated from each other according to the distance of the neighbouring slips, by unenfeebled line-shaped spectra, which in reading off the data of absorption proved to be useful means of orientation. Three such proofs, each of a different time of exposure, were always produced on a plate of 20 mm. in width. Such spectral series, on account of their compactness, afford an excellent general view. Even when magnified six times, all the forty-five spectra of such a plate can be brought simultaneously into the field of view.

Layer of glatine, 0·13 mm. in thickness. Cadmium sparks. Width of slit, 0·020 mm. Length of exposure, 1, 4, 9 sparks, 1, 4, 9, 16 . . . 81.

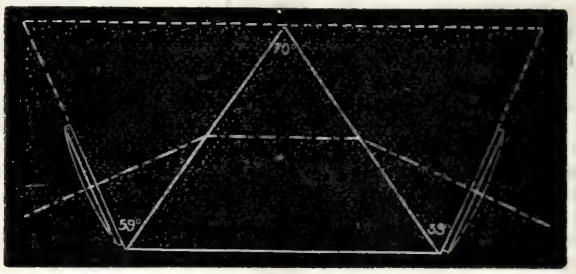
The absorption extends to the entire ultra violet. It begins to a scarcely perceptible degree at the margin of the visible spectrum, increases gradually to the line 18, rises very rapidly from here, and reaches the maximum between the lines No. 18 and No. 23, close by the line 246·93 $\mu\mu$. This line appeared in all proofs which required more than nine seconds' exposure, but invaribly as a mere trace. Its intensity did not perceptibly increase even on an exposure of eighty-one seconds.



Gelatine layer, 0·02 mm. in thickness. Arrangement of the experiment exactly as in the 0·13 mm. The absorption begins with the line No. 12, increases very gradually as far as the cadmium line 241·85 $\mu\mu$, and after a more rapid increase reaches its maximum near the wave-length 230·70 $\mu\mu$. The line No. 23 is of equal intensity in all exposures of longer than nine seconds, but it is everywhere very pale. The marginal line of these proofs, 230·70 $\mu\mu$, is rather more strongly deflected, but it can be recognised merely as a trace.

Gelatine layer, 0·01 mm. in thickness. Arrangement of the experiment as in the foregoing. The transparence is here considerably greater than in the previous case. The absorption becomes perceptible only at the wave-length 288·01 $\mu\mu$. It increases at first slowly, but, after 241·85 $\mu\mu$, rapidly. The most refrangible lines of these proofs merit special attention. Up to No. 23 they are all very intense, but beyond No. 23, as also the line 230·70 $\mu\mu$, they again become strikingly pale and dim. The longest illumination, eighty-one seconds, led this time to a more intense and extensive proof. Hence it is prolonged rather further into the ultra-violet than all the rest. It ends with the line No. 24, wave-length 226·55 $\mu\mu$, which appears as a trace.

Layer of gelatine, 0·002 mm. in thickness. Cadmium sparks. Width of slit, 0·010 and 0·020 mm. Exposure, 1, 2, 3, 4, 5, 6 jar-sparks; 42, 4, 8, 16, 32, 96 seconds. The absorption begins with the line No. 17, scarcely increases perceptibly as far as No. 18, more strongly up to No. 23



—on very short exposure No. 23 appears merely as a trace—and increases then so suddenly that all the lines only become efficient on prolonged exposure, but then powerfully. No. 24 concludes the spectrum, and—which is very uncommon—as a very intense line. There is not a trace of the refrangible lines Nos. 25 and 26.

Layer of gelatine of 0·001 mm. in thickness. Cadmium and zinc sparks. Otherwise as for the thickness of 0·002 mm. The transparence makes here notable advances. Up to No. 24 the spectrum appears almost in full force. Nos. 25 and 26, which were previously absent, now appear on short exposure, though feebly, and even the most refrangible lines of zinc can be traced to the last, which is a mere trace.

Layer of gelatine, 0·0004 mm. in thickness. Zinc, aluminium, and tungsten sparks. Otherwise as at the thickness of 0·002. The absorption takes place quite uniformly, as is best shown with the tungsten spectrum. It begins with No. 23, is considerable at No. 27, increases from these progressively, and becomes complete near the aluminium line No. 30 traces of which may already be recognised.

Layer of gelatine, 0·00025 mm. Zinc and aluminium sparks. Width of slit, 0·040 mm. Exposure as for the thickness of 0·002 mm.

The transparence extends strikingly further towards the more refrangible side. All the aluminium lines appear as traces, No. 32 stronger than the rest.

Layer of gelatine, 0·00008 in thickness. Aluminium, thallium, and tungsten sparks. Width of slit, 0·020 also 0·080 mm. Exposure, 1, 2 jar-sparks; 1, 2, . . . 120 seconds. All the lines of aluminium appear paler than without the gelatine layer. The influence of absorption can be followed even in such thin films up to line No 26.

Victor Schumann.

(To be concluded.)

News and Notes.

Photographic Society of Great Britain.—Technical Meeting, March 27. A lecture on *Rejlander*, by Mr. A. H. Wall, will be read by Mr. Snowden Ward, and illustrated by slides by Mr. C. H. Oakden. Mr. T. R. Dallmeyer will show lenses fitted with green and yellow screens, and Mr. Burchett's results therewith.

Under the chairmanship of Mr. Thomas Fall, the members of the Central Photographic Club held a Bohemian Smoking Concert at Coleman's Hotel, Covent Garden, W.C., on Friday Evening, March 16. The room was crowded, many ladies being present, and a long and diversified programme and songs, music, and recitations, was gone through to the evident enjoyment of those present. There was also given an amusing sketch, entitled the "Fickle Maid of Peckham," which contained sundry jokes of a photographic character.

The Camera Club Journal.—Mr. George Davison writes: "In your issue of the 16th inst., you report Mr. Spiller as expressing regret that Mr. Briant's paper on altering the colour of platinum images should have appeared in the *Camera Club Journal*, on the ground that that journal is not generall

* Continued from page 153.

accessible. As this is not the case, and as some of the most valuable recent contributions to photographic knowledge are to be found only in its pages, it would be well that Mr. Spiller and your readers should be set right in the matter. The journal is published by Messrs. Harrison & Sons, 45, St. Martin's-lane, W.C., of whom copies may be obtained."

SOUTH LONDON PHOTOGRAPHIC SOCIETY'S BOHEMIAN SMOKING CONCERT.—A very enjoyable Bohemian Smoking Concert was held on Monday, the 12th inst., at the Montpelier Hotel, Choumert-road, Peckham. The President (Mr. F. W. Edwards) made an ideal chairman, and he was ably supported by the Hon. Secretary (Mr. C. H. Oakden) and the Stewards (Messrs. Boyce, French, Lester, and Fellows). The ball was started rolling soon after eight o'clock, the harmony being sustained with unflagging interest until the midnight hour had approached. Miss Eva Hammond made the most decided hit of the evening with her renderings of "Whacky Whack," "Marguerite," and "What do I care," all of which were most enthusiastically applauded. Mr. Sidney Smith, with his nautical song, was well received, as were also Mr. J. J. Dooling's "Queen of the Earth," Mr. F. Crafter's "Linger longer, Loo," and "The Cigar Girl," Mr. P. A. Marsden's "The clink o' the spur," and Mr. W. A. Carleton's "True till death." Two members of the Carl Rosa Opera Company delighted the audience with "Excelsior," and Miss Flambart sang a pretty song. Mr. Charles Garnett was very funny in his representation of "The Shopwalker" and "The verdict was." A comic sketch entitled, "The Fickle Maid of Peckham," which introduced several topical photographic subjects, was given by Messrs. F. A. Cooper, E. Buston, H. F. Leonard, and C. A. and E. G. Ruckes, evoking considerable amusement. The presence of a large number of ladies graced the entertainment.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
26	Photographic Club	Stanford-le-Hope. Trains from Fenchurch-street, 9.13 and 10.28.
27	Birmingham Photo. Society	
27	Great Britain (Technical)	
27	Hackney	Prize Slides.
27	Halifax Camera Club	
27	Lancaster	
27	Leith	
27	Newcastle-on-Tyne & N. Counties	
27	Paisley	
27	Rochester	
27	Warrington	
27	West London	*Photogravure.* C. Whiting and H. Dovaston.
28	Bath	
28	Burnley	
28	Leytonstone	Ladies' Lantern Evening. *A Trip to Ostend.* Dr. W. Pickett Turner.
28	North Middlesex	Members' Lantern Evening.
28	Photographic Club	Last Monthly Lantern Meeting of the Season.
28	Southport	
28	Stockport	
29	Camera Club	*Suggestions for the Improvement of Lantern Slides.* C. Hussey.
29	Ealing	*Enlarging.*
29	Glossop Dale	
29	Halifax Photo. Club	
29	Hull	
29	Leeds Camera Club	*Photographic Optics.* Mr. Vevers.
29	Liverpool Amateur	Monthly Meeting.
29	London and Provincial	
29	Oldham	
30	Cardiff	
30	Central Photographic Club	*Retouching and the Trade.* Redmond Barrett.
30	Croydon Microscopical	
30	Holborn	
30	Maidstone	
30	Swansea	
31	Hull	
31	Leytonstone	Lantern Evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 15,—Mr. A. Cowan in the chair.

It having been decided by the Association to accept the invitation of the Central Photographic Club to hold an exhibition of members' work in the rooms of the latter body, Wednesday, March 28, was fixed as the date for sending in pictures to Coleman's Hotel, Henrietta-street, Covent Garden, W.C.

SILVER TONING OF PLATINUM PRINTS.

Mr. A. HADDON said he had recently attempted to deposit silver on a platinum print, so as to intensify it, but was not aware that Mr. Wall had been experimenting in the same direction. He (Mr. Haddon) adopted the ordinary method in developing wet-collodion plates, employing a solution containing—

Ferrous sulphate	2 grains.
Acetic acid	30 minims.
Silver nitrate (one per cent. solution)	A few drops.

He passed round a print the half of which had been treated in this manner and it was observed that the weak parts of the image had been materially strengthened. After the print was soaked in water, the above solution was poured over it. The platinum which is in the paper serves as a number of nuclei, on which the silver is precipitated by reduction with the protosulphate of iron, the silver being deposited on the platinum in preference to the paper. The print is then washed, toned with gold, and fixed with cyanide of potassium. By this method prints that are weak can be brought up to any required density. The process takes about a minute. It would be possible to remove the whole of the silver deposited by means of iodine and cyanide of potassium. He (Mr. Haddon) had tried Mr. Dollond's method with glycerine and gold chloride, and found that the latter stained the paper. In reply to Mr. Child Bayley, he said the whole of a silver image could be replaced by platinum; the latter being tetravalent, a quantity proportionate to the silver, which was monovalent, would be required.

Mr. P. EVERITT thought this would be an economical way of obtaining platinum images, as there would be no waste of platinum.

MISCELLANEA.

Mr. HADDON referred to a recent recommendation of Mr. Child Bayley as to the use of nitric acid as a preservative of pyro in solution, and suggested that it would be better to employ sulphurous acid, which, unlike nitric acid, was not prone to part with its oxygen.

Mr. CHILD BAYLEY had used nitric acid, and found it answer very well. He had kept a pyro solution so preserved for three or four months. Sulphurous acid was not so readily obtainable.

Mr. HODD had used nitric acid, and found that it threw down carbonaceous matter from the pyro solution.

Mr. EVERITT asked if a positive lens used to shorten the focus of a rapid rectilinear would interfere much with its definition and covering power.

Mr. W. E. DEBENHAM was of opinion that it would, unless a very small stop were used.

Mr. J. Cole showed a new rising front for attachment to a square form of camera, used for stereoscopic or monocular purposes, which easily enabled the front to be raised or lowered to the maximum extent. It is controlled by rack and pinion movement on the front, and, by means of a "reeding" arrangement, readily folds or unfolds on the top of the camera. There are no projecting parts, and portability is not sacrificed.

PHOTOGRAPHIC CLUB.

MARCH 14,—Mr. J. R. Williams in the chair.

Mr. Thomas Bedding showed some very early examples of Fox Talbot's photo-engraving process; also a number of old Talbotype portraits of Tyndall, Brewster, Dr. Bence Jones, Thomas Ross, R. W. Thomas, Claudet, paper negatives, and various other old prints, &c., lent by Mr. R. C. Murray.

The CHAIRMAN asked if iodised albumen would keep.

Mr. E. W. FOXLEE said it would keep for some weeks.

Mr. F. A. BRIDGE passed round a negative with large circular markings upon it, and asked the cause. He showed a negative of a similar subject (an interior), taken with a shorter focus lens, which was perfect.

Several suggestions were made as to the cause, reflection or flare being generally thought to be accountable, and it was pointed out that the plate could not be at fault, as the edges were clear.

The HON. SECRETARY stated that, in making carbon transparencies, he had patches of matt surface which did not show after varnishing. He asked the cause.

Mr. FOXLEE was of opinion that the patches were caused by the tissue being too highly pigmented. He would coat with collodion instead of with varnish.

The Easter Monday outing was fixed for Stanford-le-Hope, Essex. Train from Fenchurch-street at twenty-eight minutes past ten.

Ealing Photographic Society.—March 15.—Practical demonstration of flashlight work, the whole arrangements being undertaken by the President, Mr. H. W. Peal. Two exposures were made, the subject being a very young lady, who proved quite equal to the occasion, and posed naturally and gracefully. The meeting, which was well attended, adjourned to the dark room, where some of the plates exposed were developed, the results being highly satisfactory, there being a marked absence of hardnesss, a full exposure having been obtained working at *f*-8 or *f*-10. Four of Hart's lamps were used, supported on two stands designed by the President.

East London Photographic Society.—March 13, Mr. E. Stone (Vice-President) in the chair.—Messrs. B. J. Edwards's dark slide, Adams's adjustable shutter, and Turnbull's walking-stick tripod were passed around and described by Mr. G. S. PASCO, each article in its way being well put together, and showing unequival advancement in manufacture over previous existing forms. A hand and stand camera was also exhibited by the same member, and which he will shortly place on the market, combining several new points in construction and other improvements over the general run of such cameras for dual purposes. The remainder of the evening was occupied by a paper of Mr. Terrick Williams, read by Mr. G. E. BENNETT, entitled *Impressionism and other Departures in Modern Art.* A discussion followed, the principles in the main being generally accepted and agreed to.

West London Photographic Society.—March 13, Mr. G. Blackmore in the chair.—Mr. G. C. Haite having been prevented by illness from giving his lecture on *Applied Photography*, his place was taken at short notice by Mr. E. A. LEBLANC, who described the new developers invented by Dr. Andresen, and made by the Berlin Aniline Manufacturing Company (Actien Gesellschaft für Anilin-Fabrikation), dealing specially with the group amidol, metol, and glycin. These, he stated, were derivatives of para-amidophenol, the first being sulphate salt, the second the methyl salt, and the last a mixture of the two first. For amidol he claimed that one-third less exposure might be given than for pyro development. It was easy to get an excess of density, and for this reason development should be well restrained, and the plate carefully watched. Twenty-five per cent. of density disappeared in the fixing, hence development

should be carried further than what would appear necessary. With bromide paper a short exposure should be given, and the developer well restrained, when a warm tone should result. Black tones came with a fuller exposure. For snap-shots a small quantity of carbonate of soda should be added to this developer. Metol had better keeping qualities than amidol, both in solution and in powder. It also penetrated the sensitive film better. Lantern slides developed to a pure transparent black. It was far more energetic than pyro. Glycin was specially suitable for copying, and process work, and lantern slides, on account of its non-fogging qualities. It was also good for plates of which no record of the exposure had been kept, it being possible to develop in the same solution plates of which the exposures differed widely. The lecturer concluded an interesting address by describing the qualities of the new fixing salt invented by Dr. Andresen, which he said was very soluble, less bulky than hypo, did not discolour, and hardened the films. It was also useful for clearing purposes.

Woodford Photographic Society.—March 15, the President (Mr. H. Wilmer) in the chair.—The discussion on *Clouds* was opened by the SECRETARY (H. W. Bennett), who showed several lantern slides from cloud negatives taken for printing with landscapes or seapieces. He said that it was not necessary, or even advisable always, that the clouds and landscape should be photographed at the same time, nor that the same focus of lens should be used, nor that the lighting, or direction of wind, or time of day should be the same, but that the apparent truth or suitability was of far greater importance, and that frequently combinations of landscape and clouds that may be actually correct appear less so than other combinations that are, strictly speaking, incorrect. The harmony of the whole composition, when finished, is the only standard by which it can be judged. By using a shorter-focus lens for the sky than for the landscape, a better effect of distance in the clouds is secured. For sunny clouds on a blue sky he preferred to use Edwards's medium isochromatic plates two seconds with *f*-64, and a pale yellow screen. The sky negatives should be kept thin, so as to give sufficient gradation without producing the effect of heaviness. Mr. H. T. Malby showed many slides from engravings of Turner's paintings. While the sky effects were in many cases very grand and striking, yet the departures from true forms and effects were very noticeable. The PRESIDENT, in concluding the discussion, said that not only photographers, but the public too, fully recognise how immensely good clouds improve the artistic qualities of a photograph. It was, however, of the greatest importance that the clouds added should be suitable. Zenith clouds were absolutely useless, yet the glaring error was occasionally seen of zenith clouds being used only a few degrees above the horizon. The opportunities and chances of securing good clouds under otherwise impossible conditions were greatly increased by the use of isochromatic plates and a suitable screen.

Woolwich Photographic Society.—March 15, Mr. O. J. Ellis in the chair.—Mr. W. H. DAWSON delivered a lecture on *Lenses*. The lecturer introduced his subject by briefly explaining the ancient ideas of light and the accepted theory of to-day; he also described the construction of lenses and the principles governing their action. Some interesting points were brought out concerning defects and the methods adopted to avoid them. A description of some of the latest improvements was also given. At the close of the lecture, Mr. Dawson took the opportunity of publicly thanking Messrs. Taylor, Taylor, & Hobson, Messrs. Ross & Co., Mr. Dallmeyer, and others, for specimens, prints, diagrams, &c., kindly lent for the purposes of the lecture.

Ashton-under-Lyne Photographic Society.—The following are extracts from the Third Annual Report:—The number of members continues to increase, fifty-one having joined during the year, fifteen having resigned, and one died, leaving 155 now on the books, being an increase of thirty-five on last year's report. The demonstrations, lectures, &c., have been well attended, and show a marked increase on previous years. The members' interest in the different subjects brought before them has been well sustained during the whole of the season. The library has been put in order and catalogued, and includes some good volumes of photographic interest. It also contains a number of lantern slides given by different members of the Society. The Society has also had a lantern-slide competition among themselves, which has been a great success in every respect. Seventeen members sent in four slides each for competition, and they were judged by the six members who represented the Society in the N. L. S. Competition, and who were debarred from competing in this. After much difficulty, the awards were made as follows:—First prize, Mr. Walter Leigh; second prize, Mr. John Winterbottom; third prize, Mr. Walter Chadwick; and the fourth prize, Mr. D. C. McGregor.

Liverpool Amateur Photographic Association.—Great interest was taken in two practical demonstrations given by Mr. J. L. Mackrell, a member of the Association, on the evenings of March 15 and 16. The first, *Bromide Paper Enlargements*, developed with amidol; and the other, *Enlarged Negatives*, developed with pyro-ammonia and pyro-soda. Mr. Mackrell proved practically to the large number of members present that excellent results could be obtained on bromide paper enlargements, and also enlarged negatives. He worked from quarter-plate size up to 15×12.

Macclesfield Photographic Society.—March 13.—The first of the monthly meetings of the newly-formed Photographic Society was held in the School of Art and Science, under the Presidency of Mr. E. Woodward. There was a good attendance of members and visitors, and some excellent photographs and apparatus were exhibited. For the first excursions, which take place on March 28 and 31, it was decided that Rushton, Dane Valley, and Wincle should be the destination, when views of the places of interest in that district will be taken.

Newcastle-on-Tyne and Northern Counties' Association.—March 13, Mr. J. P. Gibson (President) in the chair.—Mr. WILLIAM PARRY (Vice-President) delivered a lecture on *Instantaneous Photography, Past and Present*, and showed a large collection of slides of war vessels taken whilst running full speed, a branch of photography in which the lecturer occupies a foremost position.

Midlothian Camera Club.—March 16, the chair was occupied by the President, Hugh Marshall, D.Sc.—Mr. BIRT ACRES gave a demonstration of the carbon process by single and double transfer, which included two of Mr. J. B. B. Wellington's celebrated pictures. There was a good turn-out of members, and the meeting was one of the most appreciated of the present session.

FORTHCOMING EXHIBITIONS.

1894.		
March	.....	*Walker Art Gallery, Liverpool. Curator, C. Dyall.
,,	26–28	*Exeter Amateur Photographic Society. Hon. Secretary, Rev. John Sparshatt, Fairfield House, Alphington-road, Exeter.
April	3, 4	Rotherham Photographic Society (non-competitive).
,,	5–7	*Aston Natural History and Photographic Society. Hon. Secretary, F. W. Pilditch, 133, Wills-street, Aston.
,,	13–28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,,	16–28	*New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHERS AND THE TRADE.

To the EDITOR.

SIR,—In your "Jottings," "Cosmos" takes upon himself the appointment of general censor, and probably to his own satisfaction fulfils the office. I cannot allow the strictures he has penned against photographers also becoming dealers to pass unnoticed. He starts with, "The question is by no means new." Whoever thought of designating it as such? Still, old subjects, especially if a wrong exists, will bear ventilation, and evidently it has given "Cosmos" the opportunity of championing the side of the chemist, bookseller, &c., and relating the fact that "Your *average*" (what he means by this he probably knows) "photographer is unfortunately the incarnation of apathy and helplessness." Certainly the gentlemen belonging to the Committee and other officers of the National Association of Professional Photographers can scarcely come under this sweeping accusation, and they are endeavouring to obtain better terms; if not as dealers, to obtain some better recognition than the manufacturers are at present giving them.

"Cosmos" has given no reason why a photographer should not be a dealer, but takes upon himself the duties of prophet when he states that "*combination* may look well upon paper, but will never work out in practice." I want to know who told him. The days of prophecy do not fit well into the days of photography. It appears your correspondent places a great deal of importance on the number of photographers who replied to the circular sent out for the purpose of combination in the matter of copyright. May this not be accounted for that a large number do not avail themselves of selling their copyrights, and consequently are not so interested?

One must take exception to the couplet or adage (and even these are not new, "Cosmos") "Let the cobbler stick to his last," and the photographer running with the "hare and then with the hounds," and if they are applicable, who deserves the first more than the bookseller photographic dealer? As to the second (I suppose it looks better to have a couple, therefore he takes this one on), let the worthy "Cosmos" explain; and, as he states photographers are no worse treated than any any other business men, can he name any? Perhaps he has had a varied experience. Certainly, "Cosmos," if he be a manufacturer, let him reply as such; I am only a

THIRTY YEARS PROFESSIONAL.

PLATINOTYPE PAPER.

To the EDITOR.

SIR,—As a great amount of ignorance seems to prevail amongst photographers as to the keeping qualities of platinotype paper, I trust that you will allow me through the medium of your columns to correct this error. I should not have troubled you in the matter if the error were only shared by those who have but little photographic experience; but, when we find the Eastman Company advertising their paper as being superior to platinotype in its keeping qualities, it proves that even those who would naturally be expected to have some knowledge of the facts are as little informed as the merest tyro.

As a matter of fact, the platinotype paper improves by keeping, and is not at its best when first made; it really requires to be kept cool and dry to preserve it in perfect condition for an indefinite period.

I have seen prints on paper several years old which could not be excelled, and should be pleased to show you or any of your readers a print made by Mr. Hussey, who is, doubtless, well known to most of your readers, on paper which he had kept for eighteen months before using, merely keeping it in the ordinary tin tube without any special precautions whatever.

We are continually getting letters from all parts of the world praising the wonderful keeping qualities of the paper, and a few days ago received one from a lady, who had actually left a tin of paper in a warehouse for some years, where certainly no precautions could have been taken as to drying or renewing the calcium in the tube. This paper was purchased September 15, 1890, stored in a warehouse for two years and a half, and used in March, 1894, giving excellent results. If paper will keep in condition for three years and a half, I don't think one need be afraid of its being spoilt by age before use.—I am, yours, &c.,

ERNEST J. HUMPHERY.

Platinotype Co., 1, *Charlotte-street, Bedford-square, London, March* 19, 1894.

"THE BRIXTON EXHIBITION."

To the EDITOR.

With reference to your report of the Brixton and Clapham Camera Club Exhibition in the current issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, will you kindly permit me to say that the Iceland views, which you include as in my exhibit, are the work of Dr. Reynolds, the President of the Club; and, in fairness to Mr. J. A. Butler, a fellow-member, who has accompanied me during two summer holidays in Switzerland, I should like to explain that some of the quarter-plate platinotypes of Swiss scenery were printed by me from his negatives, and consequently entered "not for competition." This should have been stated in the catalogue, but was probably omitted in the hurry of compilation.—I am, yours, &c.,

119, *Railton-road, Herne Hill, S.E., March* 16, 1894. F. GOLDBY.

METHOD OF TIMING DEVELOPMENT.

To the EDITOR.

SIR,—"Cosmos" is right in assuming that the "personal equation" is an important factor in observing the "time of appearance" (as, indeed, it is in all photographic observations), and that two observers might get different results; but, fortunately, this "personal equation" can be allowed for, once for all, in the first trial, for, whether the observer's power of observation is quick or slow, it holds good for all future observations, presuming, of course, that the dark-room light is sufficient and fairly uniform.

I am afraid my paper suffered from the fact that I had undertaken to read it at a certain date, and had to unduly hurry over certain trials. I am obliged, in consequence, to point out a serious blunder in it, which the result of subsequent trials has made clear. It is that, in the case of pyro-soda, the proposition I printed in italics does not hold good as regards strength of developer (a grain of pyro to the ounce). For instance, if a developer containing three grains of pyro to the ounce is used and a total development of three times time of appearance is correct, this will hold good for changes of temperature and amount of alkali or bromide (within limits); but, if the developer is diluted with its bulk of water, the time of appearance will scarcely be altered, and a development of about six times' time of appearance will have to be given to get the same opacity.

To counterbalance this, I find that, in using hydroquinone, eikonogen, and glycin (so far as my trials go, for I have not yet tested the matter exhaustively), the time of appearance makes the proper allowance for dilution as well as for temperature, &c., and therefore it seems that with these developers my proposition holds good.

Metol and amidol I have also tried. They do not seem to work so satisfactorily with the method, which would probably make correct allowance for temperature, bromide, and alkali, but not for dilution.

A little misunderstanding has arisen I think, because in the experiments recorded in my paper I have made it my aim to attain a particular printing opacity for *one* selected tone of the picture, whereas, as Messrs. Hurter & Driffield have made clear, the final aim ought to be to get a certain ratio of opacities between two of the tones; but, in this case, my aim was quite in harmony with their theory, because I was experimenting with variation of developer but identity of exposure, and the ratio of densities being fixed by the exposure I had only to secure a stated opacity for one tone to ensure a fixed ratio of opacities for the whole series. When I have come to experiment on variation of exposure in connexion with my method, I test the result by comparing the ratios of opacities of the different tones.

Mr. John Sterry (in a letter of friendly criticisms) has also drawn my attention to the fact that in using my method with variations of exposure (under the same circumstances) the shorter exposure would receive a longer development than the other, whereas, according to Messrs. Hurter & Driffield, the two exposures ought to receive the same time of development to gain the same ratio of opacities. My own recent trials confirm this theory, and there is no doubt that, to gain absolute accuracy with my method, the plan would be to time the development by the "time of appearance" of a small strip of test plate which has received a standard exposure, and is developed in the same dish with the other.

I do not, however, think this will be used, for, if exposures vary from one to two, the total development by my method will only differ about twelve per cent.

In my more recent experiments I have, I think, discovered a most important fact concerning the "time of appearance," which may be of use in speed-testing, but more trials are necessary before it is ripe for publication. ALFRED WATKINS.

Hereford, March 17.

INFLAMMABLE COLLARS.

To the EDITOR.

SIR,—The enclosed letter on "Inflammable Collars" was in this morning's *Standard*. I suppose the collars are made of xylonite or celluloid. I have often wondered if photographers are aware of the very inflammable nature of "films," and if the storing of any quantity of them would affect or invalidate a policy of insurance. I should like to ask if any of your readers would like to put a packet of a dozen half-plate films on the fire? I enclose my card.—I am, yours, &c.,

March 19, 1894. L. M.

"SIR,—I desire to draw attention to the dangerous nature of the collars, made of some prepared and highly glazed material, which are now commonly used. I have just returned from the funeral of a little boy, whose death was caused in the following way. His collar, which was of the kind described above, touched the flame of a candle over which he was bending. The collar not only ignited, but blazed up like paraffin, so that the little fellow's neck was in an instant encircled with a band of flame. The nature of the burns and the shock to the system were so severe that he died three days afterwards.

"I enclose a collar of the kind that he was wearing. The advantage of them is that they can be cleaned with a wet sponge or cloth. The disadvantage of using them is terribly shown by the disastrous occurrence which I have described. I am, Sir, your obedient servant,

"*March* 16. VICAR."

A PHOTOGRAPHIC BENEFIT SOCIETY.

To the EDITOR.

SIR,—In reference to "F. J. A.'s" letter in your issue of the 9th inst., I would remind him and all others interested in the matter that I have already advocated the formation of an organization like he mentions. Among other details, the amount was stated that it would be desirable for each member to pay.

I quite agree with your correspondent that such a Society is much needed, and that few among us, however desirous we may be of helping our brother professional, would infinitely prefer to see one and all subscribing towards a Photographic Benefit and Trade Society, and thus be putting by for a rainy day, and whereby, whatever we might receive hereafter, we should be taking our just dues, and not be the recipients of charity. Why photographers have not long ere this had a Sick and Relief and Benefit Society of their own it is difficult to understand. It is quite reasonable enough to assume that there are scores and scores of male and female photographers' assistants who pay into other such societies, and who would have been subscribers in a Photographic Benefit Society had there been one in existence. For my own part, I would willingly use my best endeavours to bring about the formation of such an organization for the benefit of my fellow-workers in the profession.—I am, yours, &c., PIONEER.

To the EDITOR.

SIR,—In reply to "F. J. A.," *re* Bevevolent, I have been a member of the Photographers' Benevolent Association a number of years and on the committee for some time. The title "Benevolent" was considered to be the most descriptive of its work. I am afraid if "F. J. A." was to try a mutual benefit society amongst the rank and file of photographers he would be disappointed at the result. It has been demonstrated beyond doubt that no Photographic Society can offer the advantages that a number of friendly societies offer. The Photographers' Benevolent Association has done a grand work with the means at its disposal. If photographers, as a body, could only realise what has been done, there would be a more generous response to the appeals of our Hon. Secretary and others, who give their time and attention ungrudgingly to help their less fortunate brethren. I, for one, cannot understand the apathy and indifference of the workers, in particular when such men as the Rev. Statham, W. S. Bird, John Spiller, Traill Taylor, and the late W. Bedford and many others give their time and attention. Surely such men are always a guarantee that what is done shall be done well. I care not what name

the Society goes by, so long as it exists and brings to our knowledge the amount of distress and suffering some members have to go through. It is a labour of love for all the officers of the Photographers' Benevolent Association. If "F. J. A." would kindly inform us how to widen the basis, and what reorganizations he would suggest, he would confer a great favour, as that is what has been attempted for some time, and the assistance of "F. J. A." to make a large Society would be welcome to many.—I am, yours, &c., J. S. R.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. PIKE; T. COAN.—Shortly.

J. L.—In selling a business the agreement ought to be stamped.

WM. COLES.—Better write to Fletcher, Warrington, and call his attention to the article.

PROFESSIONAL.—We are not acquainted with any firm that undertakes the kind of work alluded to.

H. MACKRELL.—Simply dissolve the spoilt films in amyl-acetate. You are in error in surmising that amyl-acetate is a solid.

B. A.—Iodide of starch may be made by boiling starch in water, and adding to this a few drops of tincture of iodine. A very small addition suffices.

H. WILLS.—If in place of squeegeeing the prints on plain glass they be squeegeed on to ground glass, they will then have a matt surface instead of a glazed one.

F. M.—What you term stains are really caused by uneven toning, through the prints not being kept moving while in the bath. There is no remedy but to make fresh prints.

T. H.—Surely you are mistaken, or have been misinformed. We cannot tell you a suitable strength to employ, because gelatine is not soluble in absolute alcohol in any proportion.

"NOT CHEAP AND NASTY."—This correspondent dates from Wandsworth, and has gone to the trouble of posting his letter at Bedford. He has omitted his name and full address, hence the non-insertion of his letter.

K. M. R. says: "I should be much obliged if you would kindly tell me what is considered a good number of slides by reduction to make in a day, one to develop and one to expose."—Perhaps some of our friends who produce slides professionally can supply the desired information.

R. GASGIE.—Any London house will send you plates while on the tour, but it is not at all likely that they will guarantee their safe delivery at different parts of the Continent at stated times. They will, we surmise, only hold themselves responsible for punctual dispatch.

P. MILLER.—As the lens is a costly one, and of a form that we believe is not made in this country, we should advise you to send it to the maker direct to have the injury repaired. The cost of carriage will not be great if it is sent by parcels post. It had better be insured for its full value.

LENA.—Take the advice given by your friend, and do not spend money on learning the so-called "crystoleum" system of colouring photographs—that is, if your idea is, as we take it to be, to make it a source of livelihood. No good photographer would issue that class of work at any price.

C. A. J. asks: "Who is the proper authority to apply to for permission to photograph in the Crystal Palace?"—Messrs. Negretti & Zambra; they hold the exclusive right of photographing in the Palace and grounds, and permit no one else to do so. Whether they would grant permission for a fee, we cannot say.

ARCANUM.—1. A five-inch focus lens, worked on a half-plate, can scarcely be said to embrace a very wide angle. It is rather a mid-angle. 2. Not knowing the construction of the lens, we cannot say whether the back or the front element will answer best for use as a single lens, but in all probability either will do equally well.

S. S. S.—There is very little doubt but that your surmise is perfectly correct, and that the lack of brilliancy in the negatives is due to the blacking of the inside of the lens tube becoming "quite polished" by constant wiping. Reblack the mount in the way mentioned, and we have little doubt there will be an immense improvement in the pictures.

W. WARD.—The fog is due to the fog in the atmosphere at the time the exposure was made. This is proved by the edges of the plates, where they were protected by the rabbet of the dark slide, being quite clear, and the figures in the immediate foreground being bright and clear also. It is just the kind of negative that might have been expected if it had been attempted under the conditions that existed at the time. You are not the only one that was disappointed over the boat race, if that is any consolation to you.

ROOF.—It is a difficult matter to say how the studio roof can be made watertight. The question can better be answered by a local glazier after inspection. We may, however, say, if it is in the bad state described, that the whole of the old putty should be carefully scraped out from the upper side of the glass and, if the glass can be then removed, from the under side also. If not, after the putty has been scraped away, a coat of paint should be applied and allowed to dry before the new putty is put in. It is not an easy matter to make an old and neglected roof thoroughly waterproof.

T. HAMILTON says: "I am about to build a studio 28 × 13, and eight feet high to the eaves, ridge roof. The sitters will have to face the north or north-east at one end, and the opposite at the other. How much glass ought I to have at the side and roof? Ought I to have glass both sides of the roof, or only one? How much space ought I to have between the glass and the background?"—As it is often inconvenient, when the sun is bright, for the sitters to face the south, we should recommend glass on both sides. Then, while facing north, they can be lighted from either side. About four feet six inches or five feet of the roof over the background may be opaque, and say, three feet at the sides.

PERCY LYNE writes: "I am thinking of installing the electric light in my studio, and wondered if you could give me any advice on the subject. I have the wires laid on into the studio. The width is twelve feet at the background end. I thought to have a cluster of eight or ten incandescents placed in a white reflector. This should be placed upon a rod and be adjustable at any height or angle. On the other side of sitter I thought to place a large reflector. The light from the electric lamps can be equalised by a sheet of tissue paper or ground glass. Do you think that would answer the purpose, or would top light be required? and would nine lamps be sufficient. I should be very much obliged."—Incandescent lamps, if they be of the ordinary kind, will be of very little use for portraiture in the studio, even if ten or a dozen be used. Better have an arc light, particularly as you have the current laid on. That is what is always used for portrait work.

G. B. writes: "I shall be glad if you can tell me—1. How a gelatine film can be removed from a glass plate when it has a carbon print on it. I have tried waxing the plate, but the hot solution of gelatine removes the wax, and it does not answer. 2. I should also be glad to know how photographs are enamelled; and 3. How the thin leaves of gelatine which are used for packing sweets are made. These thin leaves of gelatine are generally coloured with brilliant colours, and are made up into little packets; but I want to know how the gelatine is obtained with so smooth a surface and the thickness so even, and without a paper background. I have tried pouring liquid gelatine on greased glass."—1. After the plate is waxed, coat with plain collodion before applying the gelatine. 2. Proceed as in the preceding case, and squeegee the print on to the gelatine, as with the carbon tissue. When dry, strip off. Details of the method of enamelling have frequently been given in the ALMANACS and back volumes of the JOURNAL. 3. We believe these films are made by pouring the solution on tin plates that have been previously treated with ox-gall.

PLATINOTYPE says: "On looking over some platinotype prints made about five or six years, I find that in some cases the whites have turned a decided yellow tint. I should be glad if you could kindly say whether prints by this process are liable to the evil complained of if carefully treated, say, as follows:—Four acid baths, the two last of distilled water, and afterwards washed in distilled water, until all trace of acid disappears (testing with washing soda). The prints above mentioned were made on the Platinotype Company's paper, and ordinary town water was used in clearing and washing, which may possibly have been the cause of the yellow. I saw your article on the yellowing of prints by various processes, from which I surmised that, if carefully treated, no fear of any such evil need be entertained. Now, what I wish to know is, if the prints are treated as stated, need there be any fear of their changing or losing their whiteness at any future time?"—The clearing and washing of the prints, as carried out by our correspondent, appears to have been sufficiently thorough. We ourselves would have no fear of the ultimate degradation of the whites after employing such a method. If the prints have been much exposed to light, that may have caused the discolouration.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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ANGLE INCLUDED BY A LENS.

It seems to us that some information of a popular nature concerning the covering power of lenses, the angle of view capable of being included on any given size of plate, is still needed, notwithstanding all that has in times past been written on the subject. We judge this from queries that are being frequently put relative to topics of this nature.

A question very commonly put assumes this form: "How can I ascertain what angle of view will be included on, say, a whole plate or any other size by the use of such lenses as I possess?" or this, "what is the difference between a wide-angle and a narrow-angle lens, and which will prove the more useful?"

The first thing necessary is to know what is the focus of the lens that is to be employed. This, for our present purpose, can be ascertained by measuring the distance between the ground glass of the camera and the stop, if the lens be a compound one of rapid-rectilinear form; or, if it be a single landscape lens of plano-convex configuration, the distance between the ground glass and the convex surface nearest to it. In either case the measurement obtained will represent the equivalent focus of either class of lens, provided any distant object has been brought to a focus on the ground glass previous to measuring the distance. When once the focus of the lens is known, it is a very easy matter to ascertain the amount of angle of view that will be embraced on any plate or any portion of a plate capable of being covered by that lens.

On the present occasion we shall confine ourselves to one such method, which is undoubtedly the simplest of all, inasmuch as it involves the possession of no skill beyond that of drawing three straight lines.

Draw a horizontal line on a sheet of paper. This may be of any length, but should not be shorter than the greatest dimension of the plate. It will, perhaps, be more convenient to make its length exactly coincide with the longitudinal dimension of the plate, less that cut off by the rebate of the dark slide, by which a certain portion at each side is rendered of no effect, and hence must be excluded from the calculation. From the centre of this horizontal line erect a vertical line, which must exceed in length the focus of the longest lens that is intended to be used with the particular camera. On this vertical line measure off the focus of the lens, placing one foot of the compass at its junction with the horizontal line, and from the focus thus marked draw lines to the terminals of those showing the dimensions of the plate. This gives the angle of view included on that plate by any given lens. What the special angle may be is ascertained by placing a protractor over the lines and reading off the degrees.

One such chart as we have indicated can very advantageously be made to serve for a whole battery of lenses. It is only needed that a variety of focal-distance points be marked upon the central vertical line, and a series of connecting lines be drawn between these and the terminals of the horizontal line. We have found it advisable that these be done in inks of different colours, and at the apex of each to place figures in the same colour of ink, indicating the focus of the lens and the angular subtension of the lens there marked.

Instead of duplicating the radial lines from the focus to the size of plate, one vertical line, with a horizontal one of half the primary length, will prove equally effective, but in this case the number of degrees included by the vertical and the diagonal lines must be doubled.

It sometimes happens, owing to the length of the mount or some other cause, that, instead of the plate being properly covered, the corners are left dark. This is not unavoidable, although the application of the remedy may develop a small evil; still, on the other hand, it may not do so. The wider the separation of the front and back lenses—in other words, the longer the tube in which they are mounted—the smaller will be the area of illumination, and, of course, the plate that is to be covered must form a quadrangle within this circle; but, by adopting the expedient of bringing the front and back lenses closer together by setting them in a shorter mount, this area of illumination may be increased to a considerable extent, even to the extent of illuminating a plate twice the dimensions of that for which it was sent out by the optician. But, in proportion as the circle of illumination is thus increased, so must the lens be stopped down, to keep up an equality between the central and marginal definition, for rounding of the field is the concomitant of reducing the distance between the lenses. In some cases, more particularly with lenses of a cheap foreign variety, the objective is actually improved by this treatment, the marginal definition being better than it formerly was. This is a matter which each one must try for himself. We have, however, known a lens, which covered a quarter-plate imperfectly, having been made, by the mere bringing together of the two lenses, to cover a 5×4 plate well without any stop.

It is not quite easy to differentiate between a medium-angle and a wide-angle lens. One in which the focus and the base line of the plate to be covered are equal represents an included angle of 53°, and this may be considered a fair centre of a borderland between the medium and the wide-angle.

WILL PHOTOGRAPHIC BUSINESS REVIVE?

THE photographic season is now fast advancing, and many professionals are, no doubt, already speculating as to the prospects of business. There is no gainsaying that, with the majority of portraitists, for some years past each succeeding year has proved less profitable than the one which preceded it, though, possibly, last year was, on the whole, no worse than the one before it. Various reasons have from time to time been assigned for the depression; first and foremost is the great spread of amateur photography. Amateurs have been pretty roundly rated by professionals for a long time past, and there is small question that, in many instances, they have both directly and indirectly injured the profession. But they certainly are not responsible for nearly all the depression that exists. Competition has had far more to do with it than anything else.

As a rule, competition is beneficial if it be in a healthy direction, but in the present instance, unfortunately, it has not been. It has been in the direction of "cutting prices"—one man trying to undersell another rather than excel him in results. Hence prices have been brought so low that they are no longer remunerative unless a large business be done, and, as a consequence, inferior work has to pass that otherwise would not be tolerated. Had the competition been on the lines of excellence of work, prices would still have been maintained, and the status of photography raised. In some Continental towns we have in our mind, competition is as keen as it is here in England, but prices are well kept up. The contest is in excellence of work alone. When prices were as they used to be, fewer sitters sufficed to yield the same profits as are now realised by, perhaps, three times the number. As a matter of fact, there are not three times the number of people who want their portraits taken, and, even if there were, are there not twice or more the number of photographers competing for the work?

Dry plates have not tended to improve the commercial aspect of professional photography. The ease with which, with them, fairly good results can be obtained has caused a large influx into the ranks of the profession, and thereby increased competition, but chiefly, as we have just said, in the direction of low prices, and not in the quality of the work.

Retouching has also done much to degrade photography during the last few years. By retouching we refer to what now passes under that name with many photographers, by which the human face divine is made to resemble the waxen figures seen in the windows of modistes and hairdressers rather than the features of living beings. It is said that the public like this kind of thing. We take exception to that. They like a little flattery in their portraits, perhaps—that is but the vanity of human nature; and it can be given more effectually than it generally is without destroying the whole of the drawing and chiaroscuro of the face. To do that, however, an artist is required for the work; and where is he or she who will work at the price now paid to the majority of retouchers?

It is of no use, however, dwelling on what has brought professional photography to its present low ebb. It is of more interest to look round and see if a remedy is to be found. Prices, generally, are so low that they cannot well go lower. But cannot they be raised? Combination, which has frequently been suggested, might accomplish it, but we have very little hope in that quarter. A (say, a leading photographer in a provincial town) may wish to raise his prices, and consults B on the subject, who may agree to do the same, provided that C and D also increase theirs. They refuse; hence the idea falls through. Is there any reason, however, why A should not act individually, and profitably too, and make a substantial rise—not a trifling one, mind—in his charges, provided, of course, the work is such as warrants it. We well remember—many years ago—a West-end photographer, who was almost on the point of closing his establishment, boldly advertising to the effect that, owing to the rapidly increasing number of sitters, and his determination to give each one his personal attention, rather than entrust some to assistants, he had determined to double his prices. The ruse took, and he quickly secured a good trade, though he failed to keep it for long, as the quality of work was not in keeping with his pretensions. If any rise in price is made, excellence of work—artistically and photographically—must accompany it, or it will not meet with permanent success.

Sometimes it is said that the public do not appreciate artistic and refined work. That is a mistake. It does instinctively appreciate it, particularly when it is compared with inartistic productions. Again, any work, provided it is good, is thought more of, and is more highly appreciated, when a good price has been paid for it, than if it were obtained at a cheap rate. High-class coloured work, both direct and enlarged, appears to be almost or quite neglected at the present time. It was once, and ought to be now, a very profitable branch of portraiture. If revival of business is brought about, it will, we imagine, only be by raising the status of the art, and that will not be possible with low prices.

There is one hopeful fact in connexion with the depression in photography that should be borne in mind. Trade generally has for some time past been in a very depressed state, and those businesses which may be said to be based on luxuries—and photography is one of them—are the first to suffer. Photographs are not amongst the necessaries of life, and can be done without "till times get better." Again, the unsettled state of the political world is causing a further stagnation of trade just now. However, "it is an ill wind that blows nobody good," and a general election generally brings grist to the mill of portrait photographers who are enterprising enough to take advantage of the event. An old saying is that when things get to the worst they must improve. It is sincerely to be hoped that photography as a business has seen its worst, and that the old adage will be quickly fulfilled.

Photographing Criminals.—The committee appointed by the Secretary of State to inquire into the best means of identifying habitual criminals has issued its report. The point only that is interesting to our readers is that bearing upon the mode of photographing them. It is proposed that this shall be done in the manner now adopted in prisons, but stress is laid upon the necessity of obtaining a perfectly clear side photograph, showing distinctly the profile and form of the ear.

A Ten-foot Telescope.—It is understood that the French Exposition of 1900 will be signalised by the construction of a telescope immensely exceeding in size any hitherto constructed—a three-metres (nearly ten feet) reflector. Sir Howard Grubb, at a recent meeting of the Royal Dublin Society, discussed the problem of mounting instruments of such enormous proportions. One would weigh, he estimated, eighty to a hundred tons. The difficulty to surmount is to so perfectly equipoise and relieve from friction this huge weight that it can be conveniently manipulated and carried by

clockwork, or some motive power, and with such accuracy as not to vary at any moment from its correct position by a quantity equal to the apparent motion of that object in space of one-tenth or one-twentieth part of a second. He proposes to carry out these requirements by developing further a system adopted by Dr. Common, namely, the flotation of the polar axis of the telescope. He makes a tube for the Newtonian of such a weight, and with its weight so distributed, that it will not only float in water at a certain point, but will be in a state of equilibrium when placed in any position down to a certain angle.

The White Cliffs of Dover.—According to Professor Boyd Dawkins, such a change promises to be brought about by the hand of man on the face of Nature in the neighbourhood of Dover that it behoves every one possessing negatives of the district as it now is to treasure them carefully. In reading a paper before the Manchester Geographical Society on the south-eastern coalfield at Dover, that eminent authority said that the experimental boring for coal at Dover was likely to have a profound effect on the industries in south-eastern England. The experimental stage was over, he said; all that was needed was to develop the coalfield to the advantage of the industries in the district. If the artists objected, they might, perhaps, be consoled with the thought that, after all, the effect for them would only be to turn the cliffs of Dover into "studies in black and white."

A New Achromatic Telescope Lens.—"It is well known," says *Nature*, "that, in consequence of the irrationality of dispersion, the normally achromatic object-glass is really very far from achromatic. There is always a residual colour, frequently called the secondary spectrum, so that the images of bright stars are surrounded by halos of blue or red light. For this reason a refracting telescope, designed for visual observations, cannot be employed in photography." Many attempts to combat this difficulty have been made, but not with complete success, through imperfect keeping quality of the glass employed or other drawbacks of a practical nature. There seems promise, however, that, through the experiments of Mr. H. D. Taylor, the optical manager to Messrs. Cooke & Son, of telescope renown, an objective may be produced almost perfectly achromatic, equally well corrected for photographic purposes as visual purposes, capable of construction in large sizes and of ordinary durability. Such, at least, were the properties aimed at in designing the new lens. It is a combination of two positive lenses and one negative lens, each of the three components being of glass with different optical qualities. Should all these qualities be obtained or obtainable in telescope lenses, it goes without saying that a revolution in telescope-building would be brought about, for nearly all important instruments of this class have nowadays a specially constructed lens for photographic work, which is an absolute necessity in all modern astronomical observations.

ON SOME LANDMARKS IN THE HISTORY OF PICTORIAL PHOTOGRAPHY, AND CONSIDERATIONS ON ITS DEVELOPMENT UP TO THE PRESENT TIME.

We are apt to assume too hastily that art in photography, to which the term "Pictorial Photography" is now very generally applied, is altogether a new thing; or, at least, a very recent development. But, apart from the probability that since the earliest times of the discovery, there may have been some who worked, untrammelled by restrictions imposed by a mistaken and undue influence of scientific ideas, on similar independent lines to those on which many do now, it would not be difficult to point to a few, at least, who, throughout the history of the art, have kept up a continuity of tradition: a continuity which proves that the promoters of "the new movement" cannot altogether claim a monopoly of invention.

Some, no doubt, in the face of opposition, which it has taken many years to combat successfully, and which still survives, though greatly lessened in importance, have been content to waive their active participation in the fight, and to maintain the practice of their principles for their own satisfaction only. Others, who in these days would be foremost men, applied to photography in its earliest times true artistic methods, but apparently without much appreciation, for they are now almost entirely forgotten. To how many, for instance, of the present day will the name of D. O. Hill evoke any recognition whatever? So utterly forgotten is he, even by those who have photographic literature almost at their fingers' ends, that the other day, when I asked one of these, "Do you know anything of D. O. Hill?" his answer was, "No, where is it?" And yet, if there is one man of the very earliest days of photography whose work would appeal, both in portraiture and in landscape, to the most advanced supporters of "the new movement," it would, perhaps, be D. O. Hill. I must, myself, plead guilty, until recently, to ignorance regarding him, but I have lately had an opportunity, through the kindness of Mr. Craig Annan, of Glasgow, of inspecting a few of his works, and I hope before long a means may be found of making others acquainted with them.

The schools of painting of the northern capitals of Glasgow and Edinburgh require no reference here; but we may be sure that, if painters of those schools applied themselves to the sister art of photography in its early days the charms which they found in it were not of that character which prevailed in general estimation at the time and until quite recently. As a painter of these schools, David Octavius Hill was deservedly known and appreciated; but it is as a photographer that we are more particularly interested in him. Born at Perth, in 1802, he undertook, in 1843, a large picture, *The Disruption*, and, in order to aid his work by some record of the many hundred portraits which it was to contain, he determined to avail himself of photography. At that time the calotype or Talbotype was the only practical process. To Talbot, indeed, we owe pictorial photography, and his beautiful process is even now—at least, so I cannot help fully believing—equal to almost any requirements which the pictorial photographer may demand from the art.

In the production of these calotype pictures the name of D. O. Hill is not, however, to stand alone. To assist him in the mechanical and technical details he associated with himself a distinguished chemist, Dr. John Adamson, one also who was amongst the very earliest who practised photography in any form. In their joint names the photographs were brought out and published. The arrangement of the pictures, the grouping, management of light and shade, and, above all, the delicate treatment in the suppression of unnecessary detail, were due, of course, to Hill's artistic hand. No doubt also, in those days as in our own, there were personal qualities displayed—personal methods of technique and craftsmanship, which give the *cachet* to the finished picture and distinguish it from the inanimate results which the camera, aided by a mechanical hand alone, is able to call into being.

I can only in this paper refer briefly to a few of these pictures which I have now before me. Amongst the subjects which the camera enabled Hill to produce are portraits of many of the most distinguished men of the day—of painters, politicians, engineers, great men of science, of the law, and of the church: of Brewster, of Lockhart, of Blackie, Hugh Miller, Moncrieff, Baird, Chalmers, Guthrie, and how many more? I have now under my eyes a few of the portraits, amongst them one of Sir John Gladstone, father of the late prime minister, a powerful picture of a strong-featured old man, which in no way reminds us of the lifeless work of the professional photographer of our own time, for there is not a wrinkle worked out, not a light altered, nor a modelling disturbed by after-work in the den of the mechanical retoucher. Others are of Sir Francis Grant, and several distinguished painters and politicians well known to fame. Naturally, we find in them the influence of the schools of portrait-painting of the time, and we may regret perhaps that Hill's talent as a painter and photographer is no longer amongst us to be applied to another kind of feeling which has grown in importance of late years; but, undoubtedly, these portraits are, from an artist's point of view, of high value, and not to be mentioned in the same breath with the productions of most photographic studios, even the most renowned, of to-day. I have but two of the landscapes, of which many are still in existence. They are soft and undefined in details, and the grain of the paper, which for so many years has been treated as a grievous defect, to be got rid of by any means which our inventors could devise, contributes to produce that mezzotint appearance now so much admired.

In a summary survey of the progress of pictorial photography and the men who have influenced it, it would be impracticable to mention more than a few names, but amongst them that of Rejlander cannot be omitted. In taking to photography, Rejlander brought with him the experience of a painter of talent who had studied for some time in Italy, and in his figures, especially of the nude, his knowledge of anatomy was, no doubt, of service. His manner of treating humorous subjects, his nude studies (though we

could have wished him better models), and his achievements in combination printing, all brought into photography new principles and methods, forming in his person a distinct landmark which, whether for good or evil, has had its influence on many others.

There is perhaps no more striking figure in the history of art in photography than that of Mrs. Cameron. With her there was a deliberate determination to introduce into it the distinct personality of the artist as opposed to the mechanical manipulator of a machine. Independent, enthusiastic, imaginative to a high degree, and endowed with a natural genius for poetic feeling, she undoubtedly laid the foundation-stone of that which, little by little, in the face of the strongest opposition and ridicule, has become "the new movement," as it is termed by H. P. Robinson and others. Fashions in our art may come and go, but her works have attained a position and exercised an influence which will continue to exist, and will demonstrate, as time goes on, their teaching value. They are, perhaps, more than any other productions of the camera, classic, and will be esteemed as such.

The most important revolution in ideas which has taken place in the history of photographic art has been that which has substituted in general estimation the greater freedom of varying degrees of definition for the minute precision—dear, no doubt deservedly, to the scientific mind—of the optician's lens. Very few years, indeed, need we go back to find the battle raging in the fiercest strife and confusion between the advocates of one side and the other around this question. What ridicule was cast at "the new movement" by the *quid-nuncs* of those days; what bitter contempt and scathing satire, now happily survived! For the change of front is undoubted, and men who were the most loud in opposition have remained to be converted. We do not now hear daily applied as formerly a shower of curious epithets and withering sarcasms; yet, although it is not necessary to be so entirely converted as to approve of any lengths to which the practice may be carried, rarely do we see at exhibitions the extra fine definition and the multitude of detail which but a few years back were so much striven after. At last, also, it has come to be admitted that the scientific perfect negative has no meaning artistically, and that in fact, except for other purposes, the term "perfect negative" is about as expressive as "perfect lump of chalk." There can, of course, be no more objection to a person delighting in his negatives than in such a pursuit, for instance, as stamp-collecting. Every one has a right to his hobby, and to find his pleasure where he can, and I was told lately of a member of the Paris Photographic Club who persistently refused ever to take a print from his negatives, their abstract beauty being, for him, sufficient delight.

It has been said at the beginning of this paper that pictorial photography is not an entirely new thing. There has been a process of unconscious development, and many have contributed towards it. But, even in its latest phases, there is no one man who can claim precedence as an initiator. Books and articles have been published, and the writers have fondly imagined that, because they spoke loudly in print, the sole honour belonged to them, ignoring that others worked, others consulted quietly among themselves, or hinted perhaps more publicly now and then at ideas and principles for which the snapper-up was to obtain the credit.

It would be superfluous for those who have followed the progress of photographic art at our exhibitions and in our literature to allude in every case to men who are still busy amongst us; the names of many who have made their mark as pioneers in their several ways, and who will leave indelible evidences of their influence, are on all our lips. But even in so rapid a survey it would be impossible to pass by without particular mention some who have been longer in the front rank. Blanchard, Lake, Price, Fenton, Bedford, Gale, and Sutcliffe have distinct titles to the position of landmarks in the history of the art, and, if the teaching and influence of Robinson are mentioned separately, it is because it is hardly to be doubted that not one of the others will grudge him a foremost place.

If, then, within the limits of my space I have been enabled to refer briefly to some conspicuous personalities in the history of the art, it may not be without interest to offer a few considerations on the progress which has been made in the perfecting of the implements which we use. And here, it appears to me, that artistically speaking, we are pretty much where we were thirty or forty years ago. Progress, and presumed improvements in processes have not always been for the benefit of the artist. It is evident that owing to the different conception in earlier days of the requirements, the cleverness of inventors has often been set to work from a wrong point of view. What were at one time considered to be defects, to remedy which every effort was put forth, might, from a different position, be considered positive advantages. It may, therefore, not unreasonably be suggested whether pictorial photographers would not do well to begin again at the beginning and follow out carefully the first methods and processes of such men as Hunt, with the object of seeing how the requirements of later views might best be applied to them. The enormous mass of discoveries, and aids to doing things easily, quickly, and cheaply, has been, after all, of little value to those who nowadays follow seriously the pursuit of art in photography. If we look around the walls of such an exhibition as the Salon, we shall find scarcely a picture, the effect of which could not have been almost equally as well produced with the processes of twenty—nay, even if, with certain exceptions, we compare them with the portraits and landscapes of David Hill and other Scotch artists—of forty years ago. Collodion is, if necessary, equal to any artistic requirements of pictorial photography; rough papers were, or could have been, silver-sensitised, and used as they are now; carbon, or the autotype process, was in our hands twenty or more years ago, and similar pigmented processes of equal artistic value according to modern ideas were practised still earlier. Platinotype is a distinct addition to our resources, of very high value; but, this apart, where, indeed, have been the improvements except in the greater ease, rapidity, and cheapness, qualities which are unfortunately those which tend the most towards the destruction and degradation of all the arts? If, then, such considerations as these are not unreasonable, would it not be as well to hark back?

Photographic art has not attained its apogee. It is still growing, and its aspirations seem to me to point unmistakably in the direction of the alteration and modification of the mechanical work of the camera by the feeling and craft of the artist. However seemingly pretty or even beautiful mechanically produced results may be, the day is not far distant when the absolutely personal impression of the artist hand, overpowering all consideration of the means employed, will be considered the test of admission to such an exhibition as the Photographic Salon. That, I take it, is already the condition of existence of this exhibition. It is for its organizers to apply it rigorously.

ALFRED MASKELL.

CONTINENTAL NOTES AND NEWS.

A French Photographic Museum.—The delegates of the principal French photographic societies have recently met to take into consideration the question of founding a national museum of photographic documents. M. Pector was elected president, and M. Niewenglowski, secretary. The idea is due to M. Leon Vidal, and has been accepted in principle, provided that the prints forming the collection should have the necessary degree of permanency, thus restricting them to the platinum and carbon processes. Prints having silver or iron as the basis will only be provisionally accepted. At the inaugural meeting, besides representatives of French photographic societies, delegates of all the principal learned societies were present.

How Long Should Prints be Washed?—This, says Herr Liesegang in the *Archiv*, depends on the manner of washing. He recommends the addition of a substance to the toning and fixing baths, which shall act as an indicator. As such, eosine, in the proportion of 0·02 per cent., has given him the best results. He washes until the red colouration has disappeared from the backs of the prints.

Utilising Old Celluloid Films.—M. Cardin says that celluloid, dissolved in ether and alcohol, is excellent for protecting cuts and wounds, as, unlike collodion, it does not allow the access of water to them.

Increasing the Sensitiveness of a Plate.—Mr. P. B. de Laborre says that, to impart a high degree of sensitiveness to a plate, in order, say, to take an instantaneous portrait in the studio, it should be immersed for a minute or two in the following solution:—

Bichromate of potassium	2 parts.
Distilled water	100 „

This is said to make the plate more sensitive, and it should then be exposed, without washing, and while still wet.

Blood-red Tones on Bromide Prints.—According to the *Paris Photographe*, such tones are obtained in the following way:—The print, after being fixed and washed, is immersed in a fifteen per cent. solution of bichloride of copper. The elimination of the excess of copper salt having then been removed by careful washing, the print is placed for several seconds in a solution of ferrocyanide of potassium (strength not stated), is again thoroughly washed, and then once more passed through a solution of cupric chloride, when the red image is immediately seen to appear.

Washing Albumen Prints.—In the first number of *Das Atelier des Photographen*, which is under the editorship of Dr. Miethe, the latter discusses the experiments of Messrs. Grundy and Haddon on the amounts of silver and sulphur left in albumenised prints at different stages of washing. These he summarises as follows:—1, Ten minutes' washing eliminates all soluble matter; 2, further washing extracts no more sulphur or silver, supposing that all the free silver salt of the print has been converted into the soluble silver hyposulphite. To assure the latter condition, the author recommends fixation in a first hypo bath (forty to fifty grammes of salt in 400 or 500 c.c. of water, per sheet), to wash for ten minutes in running water, and then place the prints in a second hypo bath (six to ten grammes of hypo in 150 c.c. of water, per sheet), leave in for at least eight minutes, and finally wash in running water for from ten to fifteen minutes.

Uranium Toning of Platinum Prints.—A writer in the *Photo Gazette* recommends the prints to be made by the cold-bath process, an addition to the developer being made of ten to twenty per cent. of a four per cent. solution of bichloride of mercury. This gives a brown image to start with. After fixing with HCl and washing, the following toning bath is applied:—Uranium nitrate, 5 parts; potassium ferridcyanide, 1 part; acetic acid, 30 parts; water, 500 parts. The print at first takes a sepia tone, which by prolongation of immersion changes to red. The tone may be arrested at any stage. After toning treat the prints with a solution acidified with acetic acid.

Photography and Dermatology.—Dr. E. Schiff, of Vienna, has been applying photography to the study of the human skin, and, by the aid of a small incandescent lamp and a metallic reflector, has been able to project on that part of the epidermis undergoing examination a light so strong, that by the use of very rapid plates all the details of the texture of the skin, and such small markings as are ordinarily non-apparent and are occasionally present, were obtained. The enlarged positives on matt paper are carefully coloured, and the results are said to be of great interest to dermatologists.

ON THE DETERMINATION OF THE FOCI OF MICROSCOPE OBJECTIVES, LANTERN AND CAMERA LENSES, AND OF THE SCREEN DISTANCES OF LANTERNS BY SIMPLE ARITHMETIC.

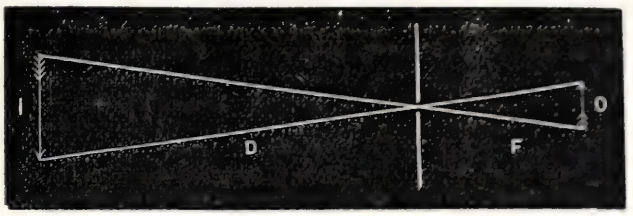
[Quekett Microscopical Club.]

From time to time various articles have appeared in text-books and in periodicals with regard to the determination both of the foci of microscope objectives, lantern and camera lenses, as well as of the distance a screen should be placed from a lantern to obtain, with a projection lens of a given focus, a disc of a given size.

As both these questions are involved in the same discussion, they may be taken together. The usual argument found in text-books and periodicals treating of the lantern and camera can hardly be called an optical one, for it merely consists of the solution of an elementary geometrical problem, involving a rule-of-three sum, but which, at the same time, wholly ignores the first principles of optics. The formula in question is found under many forms, the following being one example:—

$$\text{Distance} = \frac{\text{disc} \times \text{focus}}{\text{mask}} \quad \ldots\ldots\ldots\ldots\ldots \text{(i.)}$$

We will first examine the method by which this formula is obtained. It might aptly be termed the pinhole method, for it consists in drawing two lines across one another, as in fig. 1, which is neither more nor less than an illustration of a pinhole camera.



Instead of adhering to the usual nomenclature, it will be preferable to call the disc the image (i), and the mask the object (o), d being the distance between the image and the lens, and f the focus; no confusion can then possibly arise between d for distance and d for disc.

In the figure we see that we have two similar triangles, consequently—

$$\frac{i}{d} = \frac{o}{f} \text{ and } d = \frac{if}{o}.$$

This, then, is the method by which formula (i.) is obtained. The fallacy underlying this argument is that a pinhole has no focus. You are therefore introducing a term into your formula which has no existence in fact; or, to look at the question from another point of view, the distance between the lens and the object (slide) in an ordinary lantern is not the equivalent focal length of the projection lens. The object can only be at the principal focal point of the lens when the image (disc) is at an infinite distance from the lens, and consequently of infinite size. An excellent illustration of this error may be seen in the following example:—It is required to project a disc of 3 inches with a projection lens of 6 inches focus, the mask being 3 inches. Here we have a projection of the same size, and every one who has had the smallest experience with optical instruments knows that both the object and the image will have to be at a distance from the lens equal to twice its focal length; but what says the pinhole formula (i.)?

$$d = \frac{3 \times 6}{3} = 6 \text{ inches} = \text{focus}.$$

This is perfectly true in the case of a pinhole, as it is of no consequence what the distance may be, provided that the object is placed at a similar distance on the other side; but, with regard to a lens, it is quite erroneous, because the distance must be twice the focus, or twelve inches. The practice often adopted in elementary text-books of explaining the action of lenses by the illustration of a pinhole is to be regretted. It is not true that a lens is merely a pinhole of enlarged aperture, as is so often stated; a radical difference exists between them, viz., that a lens has two principal focal points, while a pinhole has none.

Hence, this common formula (i.) is inexact; nevertheless, it may be said that it never was intended to be absolutely accurate, but that it has been generally adopted on the ground of its simplicity. On this point we can join issue, by showing that it is not so simple as the more accurate optical formula. The expression "more accurate" is used, because, to determine the quantities in question with absolute accuracy, when a projection lens, consisting of two or more elements, is employed, would, notwithstanding the simplicity of the computation, necessitate the knowledge of the curvatures of each lens, as well as of the refractive indices of the various glasses of which they are composed, data which are not commonly available.

The optical formula, which may be found in every book on natural physics, and in the first page of every optical text-book, is

$$\frac{1}{f} = \frac{1}{d} + \frac{1}{p} \quad \ldots\ldots\ldots\ldots\ldots \text{(ii.)}$$

where d is the distance of the image from the first Gauss point, and p that from the second Gauss point to the object.

Now, for the reasons stated above, the position of the Gauss points from which d and p are measured are usually unknown; but, as d is large compared with p, the percentage of error in the case of each

* Professors Sylvanus Thompson and E. Abbe have designed instruments for the determination of the position of the Gauss points. They are, however, expensive, and not likely to be within reach of the ordinary worker.

measurement is by no means the same; thus, an error of one inch in six or nine inches is a very different matter to that of one inch in twenty feet. If, for example, there is an error, k, of one inch in the measurement of the p side, and if $m=60$, the error on the d side would be $m\,k$ or five feet; while the same error of one inch on the d side would only amount to $\frac{k}{m}$ or $\frac{1}{60}$ inch on the p side.

It is clear, therefore, that we must somehow or other get rid of p, while the small error in the measurement of d may be allowed to stand. Fortunately, there is another quantity which can be measured with absolute accuracy, and that is, the magnifying power, m, or the number of times the image is larger than the object; this is expressed by the fraction $\frac{i}{o}=m$. (Of course, in the case of a camera lens, the object and image are transposed, so that in this and all subsequent formulæ, when only a camera lens is in question, i will mean the object, and o its image on the ground glass.) Now, on that same first page of the optical text-book will be found another very elementary rule, which says that the size of the image bears the same proportion to the size of the object as the distance of the image from the lens does to the distance of the object from the lens—so $\frac{i}{o}=\frac{d}{p}$, but $\frac{i}{o}=m$.

Therefore

$$m=\frac{d}{p} \quad \text{(iii.)}$$

By (iii.) we are enabled to eliminate p from equation (ii.) by substituting $\frac{d}{m}$ for it, and thus obtain a result that will be serviceable to us, viz.:—

$$f=\frac{d}{m+1} \quad \text{(iv.)}$$

and

$$d=f\,m+f \quad \text{(v.)}$$

Let us take (v.) first. Here we see that, in order to find the distance a lantern must be placed from a screen, it is only necessary to multiply the magnifying power by the focus, and afterwards add the focus. Example:—Find the distance a lantern must be placed from the screen to give, with a 9-inch projection lens, a 12-feet disc, the slide mask being 3 inches.

The answer may be obtained by mental arithmetic in the following manner:—

As 3 inches is a quarter of a foot, the magnifying power with that size of mask will always be four times the diameter of the disc in feet. Therefore $m=12\times4$. Now, f, the focus, is three-quarters of a foot, therefore $f\,m$ is $\frac{3}{4}\times12\times4$. The 4's cancel out, leaving 3×12, to which must be added the focus. The final result is $36\frac{3}{4}$ feet. If we require a 10-foot disc, with a 6-inch lens we shall have $\frac{1}{2}\times10\times4$, and, adding the focus, we obtain $20\frac{1}{2}$ feet, the distance required. If we use a 12-inch projection lens, we have only to multiply the disc in feet by 4 and add 1.

It will now be probably admitted that the optical and more accurate method when expressed in this form is as easy, if not easier, than the less accurate geometrical, or pinhole, method, as given in the text-books. But some may say that formula (v.) is the same as (i.), with only the addition of the focus. This is perfectly true; but we reply, first, that the simplification given above, viz., that of employing the terms $f\,m$ in place of their equivalents, $\frac{\text{disc}\times\text{focus}}{\text{mask}}$ has never even been hinted in the text-books; and, secondly, that the argument by which $f\,m+f$ is obtained is based on true optical principles, and by no manner of means could it have been evolved out of the pinhole method.

There is yet another erroneous statement which one often meets with in connexion with the pinhole treatment of the subject: this is, that "double the size of the disc is obtained by doubling the distance of the lantern from the screen." Careful measurements will show that it is not the fact. The optical formula states that it is necessary to subtract the focus after doubling the distance. Example:—With a 9-inch projection lens, a 10-foot disc is obtained at a distance of 30 feet 9 inches. What distance will be required for a 20-feet disc? Double 30 feet 9 inches is 61 feet 6 inches. Less the focus is 60 feet 9 inches, the correct distance.

To ascertain the focus of a lens—be it a microscope objective, or lantern projection lens, or ordinary camera lens—the procedure is equally simple. Care must be taken to make d large, then all that need be done is to divide d by the magnifying power plus one (formula iv.) Thus, if the magnifying power is 40, and d is $20\frac{1}{2}$ feet, $f=\frac{20\frac{1}{2}}{41}=\frac{1}{2}$ foot.

The above arithmetical results are sufficiently accurate for lantern and other general purposes; nevertheless, some of our members would perhaps prefer an alternative and more mathematical treatment of the subject, and yet one which would not involve the trouble of procuring the necessary data required for the calculation of the Gauss points. Let s be the distance between i and o, viz., between the screen and the slide. Then $s=d+p$, and, by (iii.) above, $p=\frac{d}{m}$; combining these, we have

$$d=\frac{ms}{m+1}$$

but by (v.)

$$d=f(m+1)$$

then

$$f(m+1)=\frac{ms}{m+1}$$

therefore

$$f=\frac{ms}{(m+1)^2} \quad \text{(vi.)}$$

In order to be consistent with our title, this must be construed into arithmetic.

Multiply the magnifying power by the distance between the image and the object, and call the product A.

Add one to the magnifying power, and multiply the result by itself, and call the product B. The focus is found by dividing A by B.

This last formula (vi.) is perhaps the most accurate of all apart from the determination of the Gauss points. The only error consists in the measurement of s, for m can be ascertained with perfect exactness. The distance s in the case of a 9-inch-focus lantern lens will probably be only $1\frac{1}{2}$ too much; this small amount, if s is considerable, will hardly affect the final result.

In microscope objectives the Gauss points are sometimes crossed over; in these cases s will be too small. The error would, however, seldom amount to half an inch; then, if S were made 100 inches, the final error would not be appreciable. A longer distance than this might be selected for s with low powers. Before concluding, we might for a moment give our attention to p, or the "back focus," a term we succeeded in getting rid of at the beginning. It is sometimes useful in lantern and camera work to know p, but perhaps less so in the case of a microscopic objective.

By (iii.) we learn that $p=\frac{d}{m}$; then, by substituting for d its value in (v.), we have

$$p=f+\frac{f}{m}.$$

Therefore, p, the "back focus," is the "equivalent focus," increased by a quantity equal to $\frac{f}{m}$, viz., the focus divided by the magnifying power. The larger the magnifying power, the less will p exceed f; thus, when the screen is at an infinite distance, the magnifying power becomes also infinite, and $\frac{f}{m}=o$; therefore, p is as small as possible, and is equal to f. But, as the screen approaches the lens, the magnifying power becomes less, and $\frac{f}{m}$ becomes greater; when the magnifying power becomes 1—that is, when the image is the same size as the object—then $\frac{f}{m}=f$, and $p=2f$, or twice the focus. The value of p, in terms of s, may be found in the same manner as we obtained that of d above. Thus, $s=d+p$, $d=p\,m$; combining, we have

$$p=\frac{s}{m+1}.$$

Exception may be taken that the term "lantern lens" has been more often used than that of "microscope objective." The reason for this is that the same argument and language is applicable to both, and lantern examples are, perhaps, more suitable for explanation. Further, this objection should not be made by the members of this Club, as they now possess a lantern of their own. It is, there-

fore, all the more incumbent on them to understand the optical theories connected with it as well as with the microscope.

Finally, let me point out that formula (v.) contains all the necessary data for the purposes of enlargement and reduction. The rule is: Add one to the times of enlargement, and multiply the result by the equivalent focus. The back focus, *p*, has been fully discussed above.

In putting forward these few elementary notes, I trust that they will prove equally useful to all three branches of workers, viz., microscopists, lanternists, and photographers.

EDWARD M. NELSON.

A ready reference table of screen distances is appended.

DISTANCES OF LANTERN FROM SCREEN, MASK BEING THREE INCHES.

Foci	4½	5	5½	6	7	8	9	10	11	12	14	15	16	18
Disc.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft.	ft. in.	ft. in.	ft. in.	ft. in.
5	7 10½	8 9	9 7½	10 6	12 3	14 0	15 9	17 6	19 3	21	24 6	26 3	28 0	31 6
6	9 4½	10 5	11 5½	12 6	14 7	16 8	18 9	20 10	22 11	25	29 2	31 3	33 4	37 6
7	10 10½	12 1	13 3½	14 6	16 11	19 4	21 9	24 2	26 7	29	33 10	36 3	38 8	43 6
8	12 4½	13 9	15 1½	16 6	19 3	22 0	24 9	27 6	30 3	33	38 6	41 3	44 0	49 6
9	13 10½	15 5	16 11½	18 6	21 7	24 8	27 9	30 10	33 11	37	43 2	46 3	49 4	55 6
10	15 4½	17 1	18 9½	20 6	23 11	27 4	30 9	34 2	37 7	41	47 10	51 3	54 8	61 6
11	16 10½	18 9	20 7½	22 6	26 3	30 0	33 9	37 6	41 3	45	52 6	56 3	60 0	67 6
12	18 4½	20 5	22 5½	24 6	28 7	32 8	36 9	40 10	44 11	49	57 2	61 3	65 4	73 6
13	19 10½	22 1	24 3½	26 6	30 11	35 4	39 9	44 2	48 7	53	61 10	66 3	70 8	79 6
14	21 4½	23 9	26 1½	28 6	33 3	38 0	42 9	47 6	52 3	57	66 6	71 3	76 0	85 6
15	22 10½	25 5	27 11½	30 6	35 7	40 8	45 9	50 10	55 11	61	71 2	76 3	81 4	91 6
16	24 4½	27 1	29 9½	32 6	37 11	43 4	48 9	54 2	59 7	65	75 10	81 3	86 8	97 6
18	27 4½	30 5	33 5½	36 6	42 7	48 8	54 9	60 10	66 11	73	85 2	91 3	97 4	109 6
20	30 4½	33 9	37 1½	40 6	47 3	54 0	60 9	67 6	74 3	81	94 6	101 3	108 0	121 6
25	37 10½	42 1	46 3½	50 6	58 11	67 4	75 9	84 2	92 7	101	117 10	126 3	134 8	151 6
30	45 4½	50 5	55 5½	60 6	70 7	80 8	90 9	100 10	110 11	121	141 2	151 3	161 4	181 6
35	52 10½	58 9	64 7½	70 6	82 3	94 0	105 9	117 6	129 3	141	164 6	176 3	188 0	211 6
40	60 4½	67 1	73 9½	80 6	93 11	107 4	120 9	134 2	147 7	161	187 10	201 3	214 8	241 6
45	67 10½	75 5	82 11½	90 6	105 7	120 8	135 9	150 10	166 1	181	211 2	226 3	241 4	271 6
50	75 4½	83 9	92 1½	100 6	117 3	134 0	150 9	167 6	184 3	201	234 6	251 3	268 0	301 6

AMERICAN NOTES AND NEWS.

Chinese Perspective.—A portrait of George Davison, in Chinese perspective, graces the February number of the *American Amateur Photographer*. This sort of pose, which in this instance is something akin to the "front elevation" of the gable of a cottage of the Tudor period, consists in having everything in mechanical balance. The face is nearly full, the chin is supported upon the fingers of both hands, which form a horizontal bar across the centre of the picture, the balance being kept intact by the two arms supported on the elbows akimbo on the table in front, while the lines of the curves of the wrists are repeated by those of the shoulders. As a background to this work of mechanical balance, the head is posed exactly between two wide vertical lines, intended as a suggestion of wainscoting, the horizontal lines of which are on a careful level with the eyes. The whole composition is suggestive of a large letter A having been posed upon a letter H. This extraordinary "work of art" bears as its producer the name of F. Hollyer, concerning whom the editor or associate editress says that their readers, to most of whom he is probably unknown, will be surprised to learn that "*he is, without doubt, the first portrait photographer of the day.*" He or she adds that his work is always unconventional. Small doubt of it if this portrait be assumed to be a specimen. But what could Mr. Davison have been thinking of when he allowed himself to be made a victim of this kind of unconventionality? May the whole not have been intended as a pictorial joke?

Honorary American Titles.—What a strange fancy our American friends have for conferring titles! The *Photographic Times* has bestowed upon Mr. F. E. Ives, who now resides in London, the title of "Professor." This is a designation of courtesy frequently bestowed upon editors and presidents of societies, in addition to teachers or lecturers in public schools. Barbers, conjurers, and persons connected with the P. R. not unfrequently dub themselves as per this title. But what shall we say concerning military titles? In some States almost every man above forty who can sport a white shirt and a gold chain is a "Colonel," and might almost resent being either "Captain-ed" or even "Major-ed." But to return to our *moutons*. Mr. Ives is a better and more talented man than some legitimately named professors we know, and this applies also to "Professor" Muybridge, on whom the newspapers have bestowed the title. A friend, who at one time resided in New York, tells us that he was almost invariably addressed as either Professor, Doctor, or Colonel, "and," says he, "what was the funny part of it, I came to respond to it as if I had a right to the title."

Psychic or Spirit Photography.—From the *Banner of Light* we learn that the widely known veteran amateur, Henry J. Newton, of New York, the President of the Photographic Section of the American Institute, in the course of an address to an overflowing meeting in Carnegie Hall, upon *Light and its Effect in Photography and upon Spirit Photography*, said that in regard to this latter he had conducted his investigations in his own house, and had obtained "spirit photographs" in his laboratory. He is to devote another evening to the philosophy of this phase of occultism. Mr. Newton, being not only a scientist but also a millionaire (happy man!), can afford to snap his fingers at any hostility which may be evoked by his utterances of what the public is not yet educated into acceptance. His ability and integrity are quite admitted, his photo-chemical researches are not forgotten; let him make the public still more his debtors by trying to throw some light upon a topic that is but little understood.

America in the Isle of Wight.—We confess to a feeling of envy of those who, on a recent occasion, were privileged to be present in the Large Town Hall, Ryde, Isle of Wight, to witness a great number of choice views of American scenery, and incidents of American life, shown on the screen, the result of a visit to the New World by the renowned Ryde artist, Mr. F. N. Broderick, who has done so much to make Isle of Wight scenery familiar to nearly

every one in the South of England. Admission was by free tickets, and the Mayor presided. While in the States, Mr. Broderick had travelled between ten and twelve thousand miles, and had made over three thousand exposures, from which were selected for lantern projection the slides to be shown. Mr. Broderick said he was determined, when he started, to bring back as many memorials of his visit to the States as he possibly could. He took his camera with him, and commenced using it from the first. The first view showed the ship *Berlin* at Southampton, and other views depicted the voyagers going on board, and the crowd assembled to see them off. Mr. Broderick said they had a rough voyage out, and he showed one view of the ship heeling over in a manner rather alarming to a landsman. He had to be lashed on to take the photograph. The various parts of the ship, the cabins, the bunks, the steerage and other passengers, were all photographed, and the audience were treated to a thoroughly realistic insight into life on board ship. The entrance into New York, with the statue lighting up the entrance, were shown; also the jetty where they landed; the doctor examining the passengers (who had to put out their tongues as they passed him). Then followed a number of representations of the streets of New York, Broadway being especially admired. The views of Boston certainly seemed to have many of the characteristics of an old English city. Next came the scenery witnessed *en route* to Montreal, and some of the handsome buildings in that fine city. Next came Quebec—a quaint-looking city—which Mr. Broderick said was very French still. Mr. Broderick's trip up the St. Lawrence and the river steamers were profusely illustrated, and the numerous little islands in the river, taken from the steamer, were much admired. Mr. Broderick expressed his disappointment with the Niagara Falls. They were not nearly so impressive as he expected to have found them; and, as for the roar of the water, he did not hear it till he was on the bridge. He showed interesting views of Niagara and its neighbourhood, and of the place where Captain Webb started on his swim, and the whirlpool where he went down. The views of Chicago and its gigantic buildings (one of seventeen stories) were repeatedly applauded. Mr. Broderick is so deservedly noted for the beauty of his numerous Isle of Wight views that we can readily understand what his American ones must be, even without having seen them.

A Habit to be Discouraged.—We find that one or two American journals are beginning to adopt a bad habit, doubtless copied from a certain London one which for the present shall be nameless. It is this: In order to make copied articles appear as if original contributions, the articles are given without being completed and without any acknowledgment of the source of supply, terminating with the usual "to be continued," no acknowledgment being made until the "crib" has been completed in a subsequent number. One London journal is now getting noted for this unbusinesslike, if not dishonourable, mode of proceeding, and we should be sorry to see the abit taking root in America.—*Verb Sap.*

LONG EXPOSURES WITH RAPID PLATES.

The ever-increasing popularity of landscape and field photography from time to time brings prominently into notice the points of dissimilarity existing between out-door work and that conducted in the studio.

A distinction is thereby established of a comparatively recent date, tracing its origin to the introduction of the dry-plate process. In earlier days the important difference between field work and studio work, considered from a purely photographic point of view, did not make itself felt to any appreciable extent. In either case the routine was pretty much the same, and the results, looked at apart from their artistic merits, were usually found sufficiently uniform to justify the similarity in treatment.

The altered conditions brought about by the general adoption of the later process, while serving to show more clearly than before the division that exists between the two great branches of photography, have at the same time demonstrated that the treatment required in the one case must, under the new circumstances, be altogether independent of that applicable in the other.

For studio work highly sensitive films have come to be looked upon as a necessity. Dry-plate manufacturers, estimating very accurately the extent to which such work is practised among both amateur and professional photographers, find it more profitable to supply the market with films of that character than to produce a plate of a slower make. Field photography has suffered on account of this circumstance. The extreme rapidity of the studio plate renders it unsuitable for work conducted out of doors.

As a general rule, the amateur (to whom the larger share of this class of work naturally falls) either will not or cannot prepare his own plates. He is thus wholly dependent on the plate-maker, whose slowest brand of plate he will almost certainly find more adapted to the requirements of studio work than to those of that in which he is engaged. It is, however, only fair to admit that the fault lies not so much in the mode of manufacture as in the nature of the film itself. A gelatino-bromide film, no matter how it be prepared, is necessarily much more rapid than a collodion film. In those cases of out-door work, in which hand exposures of short duration are required, a dry plate of minimum rapidity will seldom prove sufficiently slow for an exposure that is in excess of a fraction of a second.

On this account, success under these conditions in this class of work can only be obtained in one or other of the following ways:—

Firstly, by employing shutters and like mechanical devices for the purpose of reducing the duration of the exposure.

Secondly, by the use of stops or other contrivances for limiting the intensity of the light.

Thirdly, by chemical treatment of the film previous to exposure with the object of rendering it less sensitive to the actinic rays.

The first-mentioned expedient is the one that is most commonly adopted. The advantages of the shutter for a certain class of subjects being generally recognised, there is too often a tendency to resort to its aid both in and out of season, even in those circumstances in which its services would be better dispensed with. It may with fitness be employed in all cases where objects in motion (including clouds and atmospheric phenomena) are to be reckoned as essential portions of the subject-matter. It will also be found serviceable in landscape work of a panoramic character, where the points of interest are more or less confined to one plane, and where the distance is considered of more pictorial importance than the foreground. Lastly, when the condition of the light is favourable, it is always to be preferred in cases where grouped figures form the chief element in the landscape, as by its means the possibility of any movement on the part of the sitters is reduced to a minimum. These specified subjects being excluded, the shutter will be found but ill adapted for general landscape work. One instance, of a type very common in the practice of the field photographer, will sufficiently prove this.

Supposing it is desired to include in a single picture two objects exhibiting a wide difference in regard to range of tone, as, for example, a whitewashed cottage in sunlight, associated with a mass of dense foliage in shadow. Here an instantaneous exposure will exaggerate the actual difference to such an extent that the finished negative will represent these objects not as they as they appear to the eye, but as mere patches of black and white destitute of all detail.

Again, the shutter will be found useless for work at certain seasons of the year, as in the depth of winter, when the light is rarely strong enough for anything but a hand exposure.

The second expedient, the use of the stop, is by no means so general as the use of the shutter. It is not difficult to account for this. In the first place, the lens has to be taken into consideration. In many cases the use of a stop will produce a want of uniformity in the illumination of the field. This defect is more or less dependent on the class of lens with which the stop is employed. Quality, however, does not seem to make much difference, as fine lenses, examined in this connexion, as often as not show themselves as faulty as those of an inferior character. In the second place, stopping is very apt to produce a disagreeable hardness in the appearance of the image. This being so, there remains but the third expedient, namely, chemical treatment of the film before exposure, with the object of diminishing its normal rapidity.

As yet, but little attention has been paid to this matter, and the action of reagents on the reduced bromide still awaits that thorough investigation which it certainly deserves.

In a recent number of this Journal the writer gave some account of a series of experiments with chlorine water. The merits of that reagent as a remedy for over-exposure formed the subject of the inquiry, and the results were sufficiently successful to prove the utility of a solution of the gas for restraining purposes.

The effect produced on the exposed plate, being due to the formation of a thin-surface layer of silver chloride, was the means of sug-

gesting the farther inquiry as to whether a similar layer might not exercise a protective influence against the impact of light, and so enable the time of exposure to be increased.

A number of additional experiments having been made in order to decide this important point, the results in all cases showed the chlorinated films to be markedly less sensitive than the unchlorinated.

A short summary of the more interesting experiments is here given:

Experiment No. 1.—An ordinary rapid gelatino-bromide plate was soaked for twenty minutes in semi-saturated chlorine water, made by diluting a saturated solution of the gas with an equal bulk of water. After being well rinsed in cold water, and allowed to dry, the film was exposed under a negative to diffused daylight for three minutes. In ordinary circumstances, an exposure of from one to two seconds would have sufficed to produce an image of sufficient density. The plate was then developed for nine minutes in pyro-ammonia developer of normal strength. Development proceeded with sufficient slowness to permit of all the successive stages in the formation of the image being observed. The finished picture showed not the slightest trace of over-exposure. Setting aside a certain increase in richness of tone, the image was in all respects similar to what is usually obtained on a correctly exposed plate.

Experiment No. 2.—A plate of the same make as the former was exposed under a negative to diffused daylight for thirty seconds. It was then immersed in semi-saturated chlorine water for forty-five minutes, rinsed, dried, and exposed again under a second negative to the action of daylight for five minutes. Thereafter it was developed as was the former, the development in this case being prolonged to twenty minutes. Two over-lapping images, of a fairly good density, were produced, indicating that the exposures had been pretty nearly correct. The image due to the second exposure was, however, rather fainter than that due to the first.

Experiment No. 3.—A rapid dry plate which was considered to be quite spoiled on account of its having been previously accidentally exposed to daylight was soaked for thirty minutes in the semi-saturated chlorine solution. When dry, it was exposed under a negative to diffused daylight for five minutes. It was then developed in the usual way for seventeen minutes. The resulting positive was rather under-exposed. Nevertheless, the details of the negative were quite clearly reproduced, except near the centre of the plate, where a narrow band of black, due to access of daylight, extended vertically across the film. A few pinholes and blisters were also visible. These, no doubt, owed their existence to the fact that the plate, on its removal from the chlorine bath, was not rinsed in water, as were the plates employed in the former experiments.

Experiment No. 4.—A slow Ilford plate was soaked in semi-saturated chlorine water for thirty minutes, drained but not rinsed, and allowed to dry in the dark. It was then exposed in the camera on an outdoor subject during bright sunshine, the exposure lasting for ten minutes. The development was prolonged to twenty minutes. A faintly visible and much-under-exposed negative was obtained. Had not the plate been subjected to the action of the chlorine water, a couple of seconds would have sufficed to produce a negative of proper quality. A few blisters and pinholes were again observable.

Experiment No. 5.—A rapid plate was soaked for five minutes in dilute chlorine water of such a strength that each three fluid ounces of the bath contained one fluid ounce of the saturated solution. After rinsing and drying, the plate was exposed in the camera. The subject was that of the former experiment, and the strength of the light was similar. The exposure was reduced to eight minutes. The development proceeded rapidly, and on the removal of the plate, after an immersion of seven minutes, a dense and rather over-exposed negative was revealed.

Experiment No. 6.—A plate of the same batch as the former one was soaked in the dilute chlorine solution for five minutes, rinsed, and dried. A well-lighted landscape subject having been selected, the dried film was inserted in the camera and exposed for three minutes. The development was extended to five minutes, but all the details of the image were perfectly visible when a minute and a half had elapsed. The finished negative was of good quality, but very slightly over-exposed.

Experiment No. 7.—A rapid plate, similar to the last, was soaked for five minutes in *semi-saturated* chlorine water. When dry, it was exposed in the camera for one minute, the subject and the light being the same as in the preceding experiment. The development lasted for twelve minutes. The image produced (which was almost invisible on the surface during the development) was of the fine quality obtained only on a properly exposed plate.

The foregoing experiments establish a number of facts worthy of notice.

It will be observed that there was in all cases a marked reduction in rapidity consequent on the initial chemical treatment to which the plate was subjected.

In only two instances were there any signs of over-exposure. In these the chlorine solution was apparently too weak to form a coating of silver chloride sufficiently thick to have a decided influence on the sensitiveness of the film. That the sensitiveness was influenced to a certain extent is evident from the fact that, notwithstanding the excessive exposures, the two images formed were of fair quality and wholly without opacity.

What is the limit, then, to the extension of the time of exposure beyond which this treatment fails to secure successful results? The first and the last experiment of the series provide the necessary data for the determination of this question.

Assuming the normal sensitiveness of the plate employed in experiment No. 1 to require an exposure of one second, then the exposure actually given was 179 times in excess thereof. Then, as this was the exposure for a plate that had been soaked in semi-saturated chlorine water for twenty minutes, and as the reduction in sensitiveness seems to depend directly on the thickness of the chloride film, a similar plate, soaked in the same solution for five minutes, would require one-fourth of the said exposure. One-fourth of three minutes is forty-five seconds, and the actual exposure in experiment No. 7 was sixty seconds. Taking into account the fact that the subjects and the light were quite distinct in the separate cases, theory and practice here agree pretty closely. Thus, an immersion of twenty minutes in a semi-saturated chlorine solution will be found to influence the rapidity of a dry plate to the extent of enabling the exposure to be increased to 180 times its normal amount. The advantages which such an extension of the time limit offers to practical photographers are too obvious to require any mention here.

A curious fact in connexion with experiment No. 1 seems to deserve notice. Six out of the seven chlorinated plates were dried in perfect darkness.

The first plate in the series was, however, exposed freely to gaslight for two or three hours during the drying process. This exposure, in so far as the image afforded any test, appeared to have had no influence whatever on the inner film; the chloride coating seemed to have acted as an effectual shield.

Experiment No. 2 shows that to double the time of immersion in the chlorine solution is to halve the sensitiveness of the film, or, in other words, to increase the required exposure by one-half.

Experiment No. 3 shows that it is possible by this treatment to obtain an image on a spoiled plate.

Experiment No. 4 shows that, when a slow plate has received the necessary preliminary treatment, the exposure may extend over a very considerable period. Possibly an hour might have been required in the case under notice.

Experiments Nos. 5 and 6 prove that a semi-saturated chlorine solution is preferable to a dilute one.

The working of the process is so simple, that little need be said as to the precautions to be observed. To prevent stains, blisters, and pinholes, the plate should be well rinsed in water before drying, in order to remove all traces of the chlorine bath. This should be done either in darkness or by dim gaslight.

The image is usually visible only by transmitted light. It will therefore be found necessary to remove the plate from the solution from time to time, in order to ascertain whether the development is completed. In conclusion, a word may be said as to a particular application of the process. A difficulty is often experienced in comparing the relative rapidities of two plates by different makers. Each brand may be labelled "slow," or "rapid," or "extra rapid," as the case may be, but the photographer has no ready means of ascertaining to what extent the terms are synonymous.

In such a case the chlorine bath will be found valuable, inasmuch as by its means the respective rapidities of the films may be made to correspond exactly, and a simple calculation will then enable the photographer to ascertain the extent of the former difference in sensitiveness.

MATTHEW WILSON.

ON THE PHOTOGRAPHY OF THE LUMINOUS RAYS OF THE SHORTEST WAVE-LENGTHS.*

A LAYER of gelatine 0·00004 mm. in thickness. Aluminium and tungsten sparks. Width of slit, 0·020 mm. Time of exposure, 1, 2 sparks; 1, 2, 4, 8, 16, 32, 96 seconds; for tungsten, three minutes. The most refrangible ultra-violet is absorbed by this extremely thin film to an unexpected degree. Even the most refrangible zinc rays appear rather enfeebled, far more than those of aluminium; and the entire portion of

* Continued from page 188.

the tungsten spectrum beyond No. 32 is totally absent, even on exposure of several minutes. Nothing can give a better idea of the resistance which the most refrangible rays encounter, even in so thin a stratum, than the behaviour of the line No. 32. Whilst without gelatine its earliest traces appear even after exposure of one second, with gelatine it does not become visible until after four seconds. The same intensity which it acquires in eight seconds requires, if gelatine is present, three or four times the length of exposure. After an exposure of thirty-two seconds, it is more intense than after ninety-six seconds with the use of gelatine.

If we collate these results, we see that gelatine absorbs the ultra-violet up to the cadmium line No. 18 very slightly, beyond this line more strongly, but beyond the line No. 24 to such an extent that here a film of gelatine not exceeding the tenth part of the thickness of the coating of an ordinary dry plate keeps back entirely all the rays, and that even the fiftieth part of this stratum weakens the most refrangible rays (185·2) down to one-third of their original photographic energy. At the same time, we must remember that this result was obtained with gelatine plates; consequently, under the repressing influence of the same absorbent, the transparency of which has to be ascertained, how much greater would not the absorption have appeared if plates free from gelatine could have come into use?

If we wish to procure a clear conception of the resistance which gelatine opposes to the most refrangible rays in the photographic plate, we must consider more closely the relation between the thickness of the coating of the plate, the particles of silver bromide, and the gelatine films employed.

The granular silver bromide, which chiefly forms the sensitive constituent of all gelatine dry plates, consists of small globular granules, which, *e.g.*, in my emulsions must, according to my measurements, continued for many years, have a diameter of 0·0012 to 0·0017. These granules are very uniformly distributed in the coating of the plates. If we suppose this coating resolved into strata of the thickness of such a granule running parallel with the surface of the plate, a single stratum suffices to absorb nearly all the rays which are more strongly deflected than the line No. 24. It is here assumed only that the granules of silver bromide are not more transparent than their connecting medium —the gelatine. This assumption is so far justified, as both the mode of origination of the silver bromide in the gelatine emulsion and its general behaviour have shown that the granule is not merely embedded in the gelatine, but pervaded by it. But it appears from this exposition that the purely photo-chemical effect is restricted to the upper strata of the coating of the plate, and that the number of the layers decreases also with the wave-length of the rays concerned. If this is the case, the relations are exactly as with plates having a very thin coating of emulsion, which always gives inexpressive pale and mostly useless proofs.

All circumstances show that the want of intensity and sensitiveness which the gelatine plate always shows in proofs of the most refrangible ultra-violet, and the sudden decrease of both beyond the cadmium line, No. 24, depend to a considerable extent upon the insufficient permeability of the gelatine.

C. *In Silver Bromide.*—If we expose silver bromide to the luminous rays, it soon takes a blue greyish violet colour. This circumstance could not be overlooked in the investigation of its transparency. I have taken it so far into account as to reduce the exposure to a minimum in taking proofs. The very energetic sparks required were yielded by the above-named influence machine in connexion with the Reiss battery, but an inductorium was also employed. That my silver bromide screen must have assumed a colour is involved in the nature of the case, though the appearance was invariably contrary. Whether and in how far this colouration has been manifested in the absorption spectra it did not appear with certainty. But from one circumstance it may be inferred that it cannot have any great importance: the first and the last proof of the same screen did not essentially differ from each other.

The silver bromide for the screens, like that of the gelatine dry plate, was prepared with an excess of alkaline bromide, then washed, and the quartz plate used for the gelatine experiments coated therewith in a wedge-shaped layer and dried. As with the gelatine, the coating of the plate was here also scraped away for a short extent, but only in three plates of increasing thickness. In this manner there were obtained three screens of different thickness for the rays. The thickness of these screens I have not been able to ascertain. The micrometer used for gelatine was quite useless on account of the liability of the coating of the plate to suffer injury, and the microscope was not certain enough. The use of the screen-plate in taking photographs was here as with gelatine. The proofs this time extended, not as in former cases merely to the most refrangible ultra-violet, but they comprise the entire region from the Frauenhofer line D to the most refrangible rays of the aluminium.

I selected a wider spectral region than in the former proofs in order to acquire a better insight into the absorption relations of the silver bromide. The plates for this purpose contained erythrosine silver, which is well known to confer on bromide silver gelatine a remarkable sensitiveness to the yellow. For electrodes of the influence machine there were used two brass balls, which yielded a very efficient light. With a slit of 0·020 mm. in width a single spark showed the spectrum in an almost uninterrupted succession of its lines from D to the wave-length 200 $\mu\mu$. For the most refrangible rays there were again used aluminium electrodes and the inductorium.

The total result of these proofs may be briefly summed up by saying that the silver bromide employed absorbs energetically all the rays of the region in question, even the cyanic blue, the green, and the yellow. Even the thinnest of the three layers, although to the eye strongly translucent, almost totally kept back the light of a single spark. The thicker layers did the same even on a rather more prolonged exposure. If we compare the spectra photographed with the same time of exposure, we find that the absorption in silver bromide extends almost uniformly over the entire spectrum, but that the most refrangible rays from about the wave-length 210 $\mu\mu$ are rather less affected. This part of the spectrum is everywhere relatively rather more powerful than the other spectrum. Hence, if the degree of the absorption afforded a certain standard for sensitiveness, the sensitiveness of silver bromide must decrease somewhat towards the more refrangible side. But I cannot ascribe too high a value to this conclusion, since it is sufficiently known from the foregoing that the lines of this region are in general paler than the others. In consequence, the contrast of intensity between parallel proofs varies within such narrow limits that its estimation is always involved in considerable uncertainty.

According to these proofs we may assume that silver bromide is sufficiently sensitive for photographing the unknown ultra-violet, and that the want of intensity from which my proofs suffered must be referred to the presence of gelatine.

D. *In Air.*—In my previous proofs of the most refrangible rays a reduction of the focal distance had reduced the resistance of the air to the desired degree. The present purpose required more energetic means. The air must be removed entirely, or at least so far that its resistance did not permanently damage the photographic effect. The conditions were therefore again pressing, but this time for photographing in a vacuum to a heightened extent, which my former designs for a spectral apparatus translucent for the ultra-violet had already taken into consideration.

Still the same considerations as formerly stood in the way of the execution of an exhausted spectroscope. And yet it was the sole remaining means that offered a prospect of success as long as I would not forsake the systematic examination of the obstacles.

The technical difficulties in the construction of such an apparatus were increased as soon as we wished to place in the vacuum not merely the prism and the lenses, but also the plate and the slit. If both remain outside the vacuum, not merely the construction of the apparatus but also its management will be much simplified. The adjustment of the slit, the care of its edges, the exchange of the plates, and the displacement of the case in series of proofs, as well as the arrangement of the case itself, can remain exactly as in an ordinary spectral apparatus.

The exhaustion may then be effected more simply. It does not need to take place at every change of the plates. The apparatus when once exhausted is available for a long time and for any desired number of proofs. At the same time such an instrument is relatively simple in its exhausted part, and the stratum of air between the slit and the plate can be brought without difficulty to the modest dimension of one centimetre in thickness.

According to the observations of others as well as to my own, I considered a stratum of air of this thickness as quite unobjectionable for the present purpose. If the air had been at all an obstacle in my earlier proofs with a short focal distance, the spectrum must decide when I reduced the thickness of the stratum to more than its thirtieth part, as was actually the case in a stratum of air of the thickness of a centrimetre.

This idea was at the foundation of the apparatus with which I sought to decide on the absorption of the most refrangible rays in the air.

I introduced the prism and the lenses of the apparatus of a short focus, carefully observing their respective positions, into a brass case closed air-tight. It had behind the slit and in front of the photographic plate two apertures for light, which were closed with plane parallel plates of fluor spar. Without the vacuum, at the distance of 2 mm. vertically from

the fluor-spar plate concerned, were the aperture of the slit and the photographic plate. When in use, the apparatus was connected (by means of a glass ground junction) with a mercurial air-pump (Geissler, of Bonn), by which it was exhausted according to the manner of Geissler tubes.

This was, in broad outlines, my first exhaustible spectrum apparatus. I omit here a minute description of the movement of the object lens, the slide of the slit, and the track of the case, as I purpose mentioning them in full by the opportunity of certain important improvements which I devised afterwards. But, for the better understanding of the following result, I will describe the path of the rays between the spark and the photographic plate at the respective distance of 4 mm. The rays traversed before reaching the vacuum a stratum of air of 6 mm. in thickness and the first closing plate (3 mm.), in the vacuum the lens of the collimator, the prism, and the lens of the camera, on leaving the vacuum at the angle of 20° the other closing plate of the same thickness, and lastly, still at the same angle, the stratum of air of 2 mm. which separated the covering plate from the photographic plate. As the prism of the lenses were of fluor-spar no other absorbents came into consideration except air, which acted as a stratum of approximately 10 mm. in thickness.

The spark was supplied by the smaller inductorium and a Leyden jar The electrodes were of aluminium and tungsten. The photographic plates were by Schleussner. Their treatment was like that already described.

The exhaustion of the air was effected in from ten to fifteen minutes. The pressure sank from below that of a mercurial column of 1 mm. Afterwards there certainly occurs a small increase of pressure due to the air adhering to the inner sides of the apparatus, and in the pores of the brass case. Where this change of pressure interfered, the exhaustion lasted longer, requiring hours; and, though I was certain that there was no fluctuation of pressure during the exposure, I was not able to procure evidence of this for a long time afterwards. I mean that the barometer test of the air-pump, in comparison with the cathetometer, is useless; but changes are shown in the most striking manner in the stratifications of the Geissler tube. Such small fluctuations were unimportant in the present proofs, in as far as they affected the absorption. It could not be otherwise with their influence upon the optical power of the apparatus, a question which, as I shall at once show, became important for the proofs.

Even the first proof, with the exhausted apparatus, showed how favourable was the action of a decrease of the stratum of the air. The spectrum of tungsten now extended beyond the wave-length 185·2 $\mu\mu$—one half further into the ultra-violet than formerly. I effected more in one minute than previously in fifteen minutes. The two components of the aluminium line No. 32 appear in these proofs at a distance from each other of 0·5 mm. With one-third metre of air, and an exposure of fifteen minutes, the tungsten spectrum can be traced 2·5 mm. towards the more refrangible side, but with one cm. of air, and an exposure of one and a half minutes, it can be followed for 4 mm. Hence, in my earlier proofs, the air had acted as a very considerable obstacle. The want of transparency of a thicker stratum of air was shown still more distinctly in photographing the aluminium spectrum. In thirty seconds there appeared, at a distance of 6 mm. from No. 32 (consequently where no action of light had ever been detected) the first traces of a group of lines with which, after fifteen minutes, with a slight increase of their intensity, there were associated three more strongly refracted lines. The most refrangible of these lines lies 9 mm. from No. 32. All attempts to demonstrate the presence of still more refrangible lines proved unsuccessful. This was the result concerning the original object of the vacuum proofs, the absorption of the rays in the air.

It was different with the applicability of the apparatus for the ultimate purpose of my work—the exploration of the region of the smallest wave-lengths. It resulted plainly, from all my vacuum proofs, that an apparatus containing air could no longer be used. Without the vacuum, every further improvement of my means of observation must remain non-effective.

But the vacuum alone was not sufficient. Without perfect sharpness, the spectra, in consequence of their small length (to which I was compelled, by the constructive difficulties of the apparatus), were worthless. I must lay an equally great weight upon clear definition, and in this point my early vacuum proofs were altogether defective. All their lines appeared blurred. Nowhere appeared the sharpness to which I had been accustomed in former proofs with the same prism and the same lenses. Without ascertaining the cause of this defect, any further progress in my research was cut off.

There were two essential points in which the exhausted apparatus differed from that containing air. In the vacuum, refraction and dispersion were effected by the fluor-spar prism alone; but, in the apparatus containing air, they were effected by the same prism, and, in addition, by two air prisms, which enclosed the former in a reversed direction symmetrically, after the manner of Rutherford prisms, and probably were not without influence upon the refraction and length of the spectrum.

The refractive angle of these air prisms was formed by the surface of the fluor-spar prism and the adjacent surface of the neighbouring lens. If the rays passed the fluor-spar prism symmetrically, both the air prisms were of equal size, and their refractive angle—if the line No. 31 was at the minimum of deflection—measured 59°. If the influence of these aërial prisms was considerable, it was possible that even small variations of pressure in the apparatus might displace the image of the slit in the longitudinal direction of the prism, and thus occasion the above-mentioned want of clearness in the lines.

Spectra situate below each other, one taken at the pressure of 700 mm. and the other after exhausting the apparatus, with an unaltered position of the plate, showed in fact a very great displacement of the lines. The components of the line No. 31 differ from each other by 0·5 $\mu\mu$ in their wave-length, and the air prisms have displaced the more refrangible of the two components by exactly so much, and the other lines in a proportion little different.

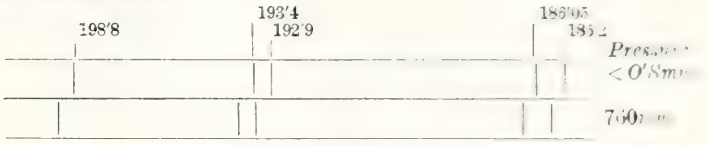


FIG. 4.

What applies to the prism holds good also for the lenses. Their focal distance is therefore greater in an apparatus filled with air than in one which has been exhausted. But I have not been able to show experimentally the connexion between the focal distance and the atmospheric pressure, probably because my proofs were defective in the requisite clearness. This was the case even with great differences of pressure, and still more with the small fluctuations which here come into play.

But even the displacement of the lines by the air prisms as they probably followed from the above-mentioned fluctuations of pressure was not sufficient—as appears at once from the proofs at the pressures of 0 and 760 mm.—to explain the defective definition. In these circumstances the cause can be sought only in the other peculiarity of the vacuum apparatus, the two fluor-spar plates introduced into the rays. In their technical execution the plates were faultless. The optical surfaces were exact planes. But with the material the case seemed different. As already remarked, fluor spar is rarely homogeneous in large pieces. My plates were certainly of crystalline clearness at the point of transit of the rays, apparently purer even than the prism and the lenses.

But I infer that they were not free from faults in crystallisation from the fact that my proofs improved in clearness when I placed the sensitive plate, not, as hitherto, behind the fluor-spar plate, but close before it, *i.e.*, in the vacuum; and that also the removal of the other plate to before the slit acted in the same direction, though only to a slight extent.

This fact was more important for the continuation of my work than it might have been at first supposed. It required a profound reconstruction of my apparatus, in which exactly its most expensive parts, the production of which had engaged me for the longest time, had to be replaced by others.

But before entering upon this matter I considered it advisable first to utilise the remaining results of absorption, those of gelatine and silver bromide, for the improvement of the photographic procedure hitherto employed, in order, if needful, to take their possible modification into consideration in remodelling the apparatus. VICTOR SCHUMANN

(To be concluded.)

Our Editorial Table.

FROM Messrs. Gauthier Villars et Fils, Quai des Grands Augustins, Paris, we have received two brochures: *Méthode directe pour la Détermination des Courbures des Objectifs de Photographie*, by Dr A. Martin; and *Sur une Méthode d'Essai Scientifique et Pratique des Objectifs Photographiques et des Instruments d'Optique*, by Captain Houdaille. Both of these have already appeared in the *Bulletin de la Société Française de Photographie*, and are able and exhaustive expositions of their respective subjects.

Herr Wilhelm Knapp, of Halle, is issuing a series of small monographs, by well-known German writers and experimentalists, under the generic title of the *Encyclopædia of Photography*, of which five have already been issued. No 2 is devoted to a summary of the experiments of Lippmann and others in colour photography, and is by E. Valenta; No. 3 has for its theme collodion emulsion, by Von Hubl; No. 4 wood engraving, by Lainer; No. 5 a simple guide-book for tourist photographers, by Neuhauss, who also devotes a chapter to cloud photography. The series will, no doubt, be highly popular among German readers.

Obernetter-Perutz Films.

J. R. Gotz, 150, Shaftesbury-avenue, W.C.

We have recently subjected samples of these films to practical trial. They are of medium rapidity, and yield clean, vigorous, well-gradationed negatives under pyro-ammonia development. The films are agreeable to manipulate, as they remain perfectly flat in their passage through the various solutions.

Paget Printing Papers: How to Use them.

By W. J. Wilson F.C.S.

Watford: The Paget Prize Company.

Mr. Wilson's brochure is a capital little guide to the use of collodio- and gelatino-chloride printing papers. A chapter is devoted to the partial development process which this company has recently made a feature; plain, useful, and common-sense directions for printing, washing, salting or bromising, toning, fixing, the alum bath, trimming, mounting, spotting and burnishing are given. The combined bath is also discussed. Altogether the book is likely to be of great use to the users of collodion and gelatine papers, as it is compiled with a singularly close regard to the requirements of practical printers.

The Company's collodio-chloride paper which has just lately been introduced does not differ in manipulations and results yielded from the gelatine paper. To prevent the paper from curling, however, a preliminary bath of water at 110° to 120° Fahr. is advised, which obviates the tendency referred to.

Gotz's Index File for Film Negatives.

This file, which is really a case, is in the form of a bound volume, and contains a series of leaves, between which the film negatives are inserted. Each leaf has its appropriate initial letter; thus all the subjects commencing with any special letter are placed together, and are immediately found in the recess thus initialed, and this without any loss of time. This applies also to loose prints. By means of a rigid interior cover and a spring, everything inserted is retained quite flat. No curling of films, however thin they may be, is possible when this "index file" is employed for their reception or storing. We can confidently recommend it very strongly as a handy adjunct to the impedimenta of both amateur and professional photographers. It is obtainable from J. R. Gotz, 150, Shaftesbury-avenue, W.C.

News and Notes.

The East London Photographic Society hold a Smoking Concert at the Crown and Cushion, London Wall, on Tuesday, April 3.

Addresses Wanted.—Mr. J. Woolfe, of Elm House, Loughton, requires the addresses of photographers at New Quay and Plymouth.

Mr. C. S. Baynton has acquired the old-established business for the supply of photographic materials so long carried on by Mr. S. Hulme at Exchange-buildings, New-street, Birmingham.

Messrs. Watkinson & Co., photographic and scientific apparatus makers, of Leeds, have appointed Messrs. W. Butcher & Son as their sole agents. Messrs. Butcher's show rooms are at 315 Regent-street, W.

Kingston-on-Thames and District Photographic Society (Founded 1893).—The club rooms of this Society are at 12 Palmer-crescent, Kingston-on-Thames. The officers are:—*President:* Rev. G. I. Swinnerton.—*Vice-President:* Rev. F. C. Lambert.—*Committee:* Messrs. C. E. Abney, Kingston Hill; G. George Cowen, M.D., New Malden; Albert Hill, Surbiton; A. F. Lemarchand, Kingston-on-Thames; W. E. Price, Hampton Wick.—*Hon. Treasurer:* W. Montague Robertson, Surbiton Hill.—*Hon. Secretary:* Dr. Finny, Kingston Hill.

Tooting Camera Club.—A Lantern Entertainment will be given by the Club on Tuesday, April 10, at the Vestry Hall. Tickets, reserved, 1*s.*; unreserved, 6*d.* The hall will be decorated with members' work. Pictures mounted, either framed or unframed, may be left with Mr. Simmonds, High-street, or at the Club-room.

Royal Institution.—The following are the future lecture arrangements:—Professor J. A. Fleming, four lectures on *Electric Illumination;* Professor J. W. Judd, three lectures on *Rubies: their Nature, Origin, and Metamorphoses;* the Rev. W. H. Dallinger, three lectures on *The Modern Microscope;* Mr. F. Seymour Haden, two lectures on *The Etching Revival;* Professor J. F. Bridge, two lectures on Music: (1) *Musical Gestures,* (2) *Mozart as a Teacher;* Professor Dewar, three lectures on *The Solid and Liquid States of Matter;* Professor W. M. Flinders Petrie, three lectures on *Egyptian Decorative Art;* Mr. H. D. Traill, two lectures on *Literature and Journalism;* Mr. John A. Gray, two lectures on *Life among the Afghans;* Captain Abney, three lectures on *Colour Vision* (the Tyndall Lectures); Mr. Robert W. Lowe, three lectures on *The Stage and Society.* The Friday-Evening meetings will be resumed on April 6, when a discourse will be given by Professor Victor Horsley, on *Destructive Effects of Projectiles.* Succeeding discourses will probably be given by Professor J. J. Thomson, Dr. J. G. Garson, Professor H. Marshall Ward, Dr. G. Sims Woodhead, the Rev. S. Baring-Gould, Professor A. M. Worthington, Sir Howard Grubb, Professor Oliver Lodge, Professor C. V. Boys, and other gentlemen.

Past and Present.—One has but to recall the names of Adam Salomon, Rejlander, Julia Cameron, Colonel Stuart Wortley, says Mr. W. S. Bird, in *Autotype Notes,* to remember that art in photography has had notable exponents in the past, when the facilities for the work were infinitely fewer than to-day. In like manner one has only to think of the productions of Robinson, Hollyer, Blanchard, Sutcliffe, Colonel Gale, and others, to know that its art capabilities are not a discovery of the Camera Club. The Camera Club makes no claim of the kind. Some of its members appear to hold a strong conviction that the art side of photography needs only intelligent cultivation, with technical knowledge and artistic faculty, to produce photographic pictures that shall be more delightful as impressions of natural beauty than any hitherto achieved, because they can be made to express also that mood of sentiment, the scene evoked in the photographer. Great is the power of faith! That a gifted artist, with simple means, trained hand and eye, and the gift of poetic imagination, can give to painted landscape "that light which never was on land or sea," and touch the mind and heart of sympathetic beholders, is a delightful fact. The variations of interpretation possible to the workers of photographic material are on a scale of narrow limitations.

"Photography and roulette," says the Paris correspondent of the *Daily Telegraph*, "have been cultivated for some time by a couple residing in the Batignolles district with considerable profit to themselves, if not to their customers. It was a case of a 'dual control.' The *appartement* was divided into equal parts, one of which was under the direction of the husband, the other under the management of the wife. In the one was the studio, while the other comprised a waiting-room and an inner chamber, in which the roulette table had been placed. While the husband was busy with a group, his spouse looked in occasionally on the persons who were waiting to have their portraits taken, entered into pleasant conversation with them, and finally suggested that they might try their luck at the gaming table by way of beguiling the time. Many accepted the invitation, and generally left the house relieved of all the cash that they had about them. In point of fact, it is almost superfluous to hint that roulette proved a more lucrative source of revenue to the pair than the photographs were ever likely to become. There is, however, an end even to such an attractive combination as photography tempered with roulette. Some unlucky customer, who had lost more money than he cared to sacrifice to the fickle goddess, put the police on the scent, and, armed with a warrant from the prefect, the commissary of the district and the *chef de la brigade des jeux*—to give that functionary his full style and title—burst into the *appartement*, and found no less than fifteen persons, including a mulatto, amusing themselves at the roulette table. The stakes, amounting to several hundred francs, were seized, and the usual *procès verbaux* were drawn up. The couple are to be prosecuted for keeping a 'gambling saloon.'"

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5095.—"Improvements in Photographic Change-boxes for Flexible Films." W. W. Beasley.—*Dated March*, 1894.

No. 5129.—"An Improvement in Photographic Cameras." A. R. Wormald.—*Dated March*, 1894.

No. 5310.—"Improvements in or relating to Photographic Hand Cameras." L. A. Franks.—*Dated March*, 1894.

No. 5357.—"Improvements in Photographic Cameras." H. Burnett.—*Dated March*, 1894.

No. 5374.—"Improvements in Photographic Cameras and the Like." J. Cole.—*Dated March*, 1894.

No. 5450.—"Improved Means for Photographically Recording a series of rapidly succeeding Views and Reproducing the same with Apparent Continuity." J. W. Young.—*Dated March*, 1894.

No. 5511.—"New Method of Reproducing Prints from Photographic Negatives." T. Moore.—*Dated March*, 1894.

No. 5551.—"Improvements in Magic Lanterns and Dissolving View Apparatus and the Like." G. Lesueur.—*Dated March*, 1894.

No. 5561.—"Improvements in Photography." Communicated by The Chemische Fabrik auf Actien vormals E. Schering. A. Zimmermann.—*Dated March*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
2	Camera Club	Smoking Concert.
2	Croydon Camera Club	Lantern Night.
2	Peterborough	
2	Richmond	
2	South London	
2	Stereoscopic Club	
3	Birmingham Photo. Society	
3	Bolton Photo. Society	
3	Brixton and Clapham	
3	Exeter	
3	Hackney	Open Night.
3	Herefordshire	
3	Lewes	
3	North London	
3	Oxford Photo. Society	
3	Paisley	
3	Rotherham	
3	Sheffield Photo. Society	
3	West London	Technical Meeting. Lantern.
3	Woodford	Public Lantern Exhibition and Concert.
3	York	
4	Croydon Camera Club	Last Lantern Show of the Season.
4	Edinburgh Photo. Society	
4	Leytonstone	
4	Photographic Club	*Lenses.*
4	Southport	
4	Southsea	
5	Birmingham Photo. Society	
5	Camera Club	*Some Researches into the Early History of Photography.* W. H. Harrison.
5	Dundee and East of Scotland	
5	Ealing	Lantern-slide Competition.
5	Glasgow Photo. Association	
5	Glossop Dale	
5	Hull	
5	Leeds Camera Club	Exhibition of Members' Work.
5	Leeds Photo. Society	*Criticism of Lantern Slides from an Artistic Standpoint.* An Artist.
5	London and Provincial	
5	Oldham	
5	Tunbridge Wells	
5	Woodford	*The Artistic Aspect of Photography.* J. W. Spurgeon.
6	Brighton and Sussex	
6	Cardiff	
6	Central Photographic Club	*Experiences.* Thomas Fall.
6	Croydon Microscopical	
6	Holborn	
6	Leamington	
6	Lewisham	Annual General Meeting.
6	Maidstone	
6	North Kent	
7	Hull	

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

MARCH 27,—Technical Meeting,—Mr. Andrew Pringle in the chair.

TONING PLATINUM PRINTS.

Mr. E. C. Hertslet passed round some under-printed platinotypes which had been toned with uranium, showing the toning process to be also an intensifying one. The whites were not in every case discoloured.

Mr. CHAPMAN JONES thought the results were more or less accidental.

In reply to the Chairman, Mr. HERTSLET stated that the intensification in some cases took twenty-four hours, the shortest time being about eight hours.

The CHAIRMAN thought the staining visible in some of the prints was due to the fact that they were not kept acid throughout the operation.

Mr. WALL suggested that halves of some of the prints should be treated with dilute ammonia, to show how far they had been intensified by the process.

COLOURED LENSES.

Mr. T. R. DALLMEYER exhibited some lenses with coloured balsams, as well as some green and yellow glass screens. He said that it was preferable to have the green in front of the diaphragm, and the yellow behind. They should be placed close to the diaphragm, and set carefully, or multiple images appear, though these latter depend a great deal upon the construction of the lenses. The most successful pictures had been taken with two separate screens, although screens had been used cemented together. Coloured balsams avoid all extra reflections, but have disadvantages. Mr. Burchett's greens had been, up to the present, aniline colours, and more or less fleeting, but this fading could be deferred by using the yellow in front of the green.

Mr. BURCHETT remarked that the screens if placed together should not touch, and passed round a number of examples showing in the most conclusive manner the benefits derived by the use of the screens. A large collection of Mr. Burchett's results were also exhibited on the walls.

Mr. DEBENHAM thought the experiments should have been made under strictly crucial conditions.

Mr. BOLAS inquired if Mr. Burchett had patented the process.

Mr. DALLMEYER said the combination of a yellow and green screen and the use of the coloured balsams were patented.

Mr. H. SNOWDEN WARD read a paper by Mr. A. H. Wall entitled, *The late O. G. Rejlander and the Progress of Pictorial Photography.* At the conclusion of the paper a number of slides, made by Mr. C. H. Oakden from negatives and prints by Rejlander, were exhibited in the lantern.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 22,—Mr. A. Haddon in the chair.

Mr. L. C. Mote was elected a member.

A very light tripod stand by the Eastman Company was exhibited.

Some discussion on the remarks appearing in *Photographic Work* of March 16, relating to the Association, took place, and the following resolution, proposed by Mr. J. WEIR BROWN and seconded by Mr. E. J. WALL, was put to the meeting:—

"That in the opinion of this meeting the reflections on the London and Provincial Photographic Association, contained in *Photographic Work* for March 16, 1894, are absolutely unfounded and unjustifiable, and we therefore call upon the editor to insert in the next issue of his journal a full and complete retractation and apology for his remarks, and that the same shall have as full publication as has been given to his strictures."

This, on being put to the meeting, was declared by the Chairman to be carried *nem. con.*

A collection of lantern slides, illustrative of the Chicago Exhibition, lent by Mr. H. M. Smith, was next shown.

PHOTOGRAPHIC CLUB.

MARCH 21,—Mr. R. Child Bayley in the chair.

Mr. W. England, who had promised to give a demonstration of the Daguerreotype process, did not put in an appearance, so that the proceedings were of an "open" character.

In reply to a question as to the function of ferrocyanide of potassium in the developer, Mr. HAES said it kept the shadows clear.

The HON. SECRETARY asked for opinions as to Mr. Watkins' statement that the time of appearance of the image in development had a definite ratio to the time necessary to bring the negative to printing opacity.

Mr. J. NESBIT thought it depended on the character of the particular plate used.

Mr. A. COWAN said that for time development a standard developer must be used.

Mr. F. A. BRIDGE believed that the ratio depended on correct exposure.

In reply to a question from Mr. J. R. WILLIAMS, who said that he had been troubled with yellow stains in pyro development, Mr. COWAN said that not sufficient sulphite had been used. He recommended ten parts of sulphite to one of pyro for securing clear blue-black negatives.

Croydon Camera Club.—The second excursion of the season was held on Saturday, the 10th, when a party of eleven visited Hayes and Wickham. On the 21st between twenty and thirty members assembled at the Club-room in the evening, when Mr. J. Smith experimented upon nine rapid plates by different makers with a view of determining which make was the best. On the preceding Saturday afternoon at four p.m. all the plates were exposed within the space of one minute, working at *f*-11, and giving one-tenth of a second, the light being indifferently bright. All were simultaneously placed in a large dish and pyro-ammonia (Cadett's formula) poured on. The result pointed to the inadvisability of treating various makes with an identical mixture. As might, perhaps, have been prophesied, the best negative was, under the special circumstances, on a Cadett plate. The isochromatics were badly fogged, which is hardly surprising. With another developing formula it was considered that a considerably different order of merit would have eventuated. Following the above, a large number of slides were projected on to the screen for selection for the forthcoming lantern show at Braithwaite Hall on April 4. They included examples by the President and Messrs. Jenkins, Whitaker, Noakes, Holland, and Bown. On Friday, the 23rd, two excursions were held, one to Crawley and another to Dorking. Favoured by the weather, some flattering scenes were attempted.

Croydon Microscopical and Natural History Club (Photographic Section).—The closing lantern exhibition of the season was held on Friday, the 16th inst., when Mr. F. W. HINDLEY delivered a lecture on *The Wilds of Connemara*, illustrated by a selection of his slides on that subject. The lecture and exhibition were of a highly interesting and amusing character, much information as to the ways of the people and of their surroundings being conveyed both by his pictures and by the reminiscences related in connexion with them by Mr. W. Hindley. The lecturer conducted his hearers over a wide stretch of wild and grand country, which was worthily illustrated by his very excellent photographs. While all were good, his pictures of the west coast scenery may be mentioned as specially fine, and some of his very amusing illustrations of pastoral life were probably more characteristic of, than flattering to, the people of the west. Mr. Hindley kept up a running fire of amusing tales throughout his lecture, and sent his audience home delighted and in high good humour.

Hackney Photographic Society.—March 13. The chair was taken by Mr. W. L. Barker, and later in the evening by Mr. T. A. Smith.—The HON. SECRETARY showed a print on Eastman's platinum-surface bromide paper, and announced the details of the first excursion of the season, to take place on Easter Monday at St. Albans. Permission had been obtained for the party to photograph in the cathedral. The rest of the evening was devoted to a smoking concert, which passed off very successfully. The following gentlemen kindly volunteered to entertain the rest:—Mr. Puttock with "Out on the Deep" and "Will o' the Wisp;" Mr. Gosling with "My old Dutch" and "'E dunno w'ere 'e ar;" Mr. T. A. Smith with "The Monarch of the Storm" and "The Postillion;" Mr. Moore, a piano solo—waltz (Chopin in E minor); and a duet with Mr. Baldwin, "The Moon has raised her Lamp"—the last-named gentleman also sang "The Last Watch;" Mr. W. Bentley sang "Up to Date" and "He hadn't been used to Luxuries;" Mr. S. J. Beckett obliged with a reading from Jerome, "Those 'High' Cheeses;" Mr. W. Fenton-Jones sang

"Thy Heart's Rest" and "Sambo's Serenade," and recited "Moses and the Sailor;" Mr. Guest sang "Sprung a Leak;" and last to mention, but certainly not least, was Mr. A. E. Bentley's "The White Squall" and "Queen of the Earth."

On the 20th inst., in the Club-room, an Exhibition was held as a result of the competition organized among members for the gold medal won some time back by the Society in a lantern-slide competition. To make the competition more valuable, the three silver medals that were offered but not awarded in the Members' Class at the late Exhibition were added. A considerable number competed, and, as a result, a good show was obtained. In printing processes, gelatino-chloride papers, ordinary and matt, were conspicuous; but other processes were not neglected, some good examples of work in platinotype, bromide, alpha, and plain-salted papers being shown. Messrs. Thomas Fall and C. H. Oakden kindly acted as Judges. The gold medal was awarded to Mr. J. Carpenter for *Marshland*. Mr. A. Hensler won the first silver medal with *Cloud-capp'd Tower*, and was commended for *Esher Bridge* and *A New Zealand Sound*. The second silver medal was gained by Mr. S. H. Barton for *Binding Corn*, and Mr. F. E. Roofe obtained the third silver medal for *Thames Barges*. Besides Mr. Hensler, as above mentioned, the following gentlemen obtained commendations:—T. H. Smith for an enlargement, *View in Rochester;* W. Selfe, for *Stream near Newbury;* and A. Dean, for *Burnham Beeches*. After the President (Mr. F. Houghton) had presented the prizes, Mr. S. J. Beckett announced the programme for the Easter Monday excursion to St. Albans.

Leytonstone Camera Club.—On the 7th inst. the President (Dr. W. Pickett Turner), in the chair, a demonstration was given by the Photo-autocopyist Company, the results being very satisfactory, and demonstrated a very easy way of producing good mechanical prints at a minimum of cost for apparatus, and capable of being worked without any previous knowledge or experience.

On the 14th inst. Mr. Walter D. Welford gave an evening entitled *What can be Done with the Hand Camera?* and, from the varied slides—about 250—that were put upon the screen, there was little room for doubt that the hand camera was capable, in the hands of an experienced worker, of turning out the best of results in almost every branch of photography. Mr. Welford, in his concluding remarks, said we were at present suffering from an artistic craze that he did not think had come to stay, the result of which was that we had many attempts to imitate art, but they were certainly not photography, as traces of the hand-and-brush work were to be seen in almost every detail. A discussion followed. In reply Mr. Welford said that hand-camera work was far more difficult than that done upon the tripod, and it was necessary that every detail of the mechanism of the working of the camera used should be mastered if good results were to be expected. He advocated magazine-changing, as it frequently happened that a wealth of good shots were to be got, one immediately following the other, when quick changing was necessary.

North Middlesex Photographic Society.—The Third Instruction Evening of the season was held on March 9, Mr. Beadle in the chair.—Mr. F. L. Pither, before a large audience, gave a very interesting lecture, the subject being, *Gleanings from Picture-galleries*. He said that pure landscape, compared with other branches of art, was quite a recent study, Albert Dürer (1471–1528) being the first painter to paint landscape. Mr. Pither carefully went through all the landscape painters from Albert Dürer to Constable, and then to the worker of to-day. He illustrated his remarks from a large and varied series of engravings, carefully examining the various points of each, and their adaptability to the pictorial photographer. Atmosphere, Mr. Pither said, was the photographer's greatest trial, and that it was important to be sure of it when exposing on any subject owing to the various contrasts met with. His method was to treat the negative with washes of colour until the proper effect was attained. In reference to sharpness of the various planes, he said no average etching gave so much sharpness as the ordinary photograph, and strongly advocated soft images, especially on large plates. A feature of the evening was a very interesting series of etchings and engravings which were hung round the walls, some thirty in all, representing pictures of the various masters. Mr. Pither went through them in order, giving most graphic particulars of each, and further illustrating his remarks by the constant use of the blackboard.

Richmond Camera Club.—March 12.—Mr. A. Horsley Hinton read a paper on the *Art Side of Photography*. He said the motive of a photograph was the chief factor in its production, and that the motive should be definite and paramount, everything else sacrificed to it. A photographer should approach his subject with some definite object in view, and not leave anything to accident or chance. In order to be able to do this successfully, he must, of course, have devoted some attention to the capabilities of his art. A painter pursues a long course of study, not to copy others, but to bring out any talent that is in him. He goes to his subject charged with an accumulated knowledge of what Nature is like under its varying conditions. So should it be with the photographer. Photography might be divided into two classes, the pictorial and scientific. The pictorial section might again be subdivided into three sections: 1, illustrative, as an assistance to speech or writing; 2, topographical (also illustrative); 3, artistic, or pictorial proper. A picture should be the reflection of Nature on the artist's mind, and the reproduction the impression which the artist had when looking at the original. The æsthetic pleasure should be the main purpose of any one working in an artistic or pictorial direction. In landscape work careful note should be taken of the impressions formed by the varying conditions of light and shade. The artistic photograph should be devoid of any topographical interest, and no one should think of asking where the view was taken, or how the result was arrived at. The ordinary commercial photographer generally forces one to exclaim, "Where was that taken?" The lecture was full of suggestive material for the serious worker. Mr. Horsley Hinton strongly condemned photography being taken up as a hobby or trivial occupation.

South London Photographic Society.—On Monday evening, March 19, Mr. W. Fenton-Jones delighted the members of the South London by delivering an interesting account of his adventures (illustrated by a large number of lantern slides) during a tour in Italy, and much information, useful to those intending at some future time to make a similar journey, was gleaned from his remarks. The President (Mr. F. W. Edwards) occupied the chair. The first slide was a copy of Mr. Fenton-Jones's passport, signed by Lord Rosebery. Then the pier-head at Dover was shown, with the steamer ready for the passage across the Channel. On the incidents of that short voyage the lecturer facetiously remarked he need scarcely dwell, some of the passengers frequently taking a great interest in the examination of the sea from the side of the boat. Landing at Calais, he and his friend who accompanied him on his tour proceeded to Nice by train. Some excellent views of this celebrated watering-place were thrown on the screen. The accommodation in the town, however, was not of the best, and the drivers of the local conveyances, similar to our cabs, were of a swindling turn of mind, and required looking after. The residence of the Queen when at Florence was shown. The Florentines themselves—and, in fact, most of the inhabitants of Italy—had a rooted aversion to washing themselves; notwithstanding that the great soap manufacturers of England advertised their wares at every possible corner, often thereby spoiling the beauty of many historic scenes. Beautiful specimens of architecture were to be seen in the gorgeous gambling saloons of Monte Carlo. The lecturer explained some of the many ways in which money could be staked at the tables, and stated that it was a sight never to be forgotten when one witnessed the intense eagerness of the players, and the way in which the golden heaps were treated as of no more value than so many piles of dirt. The remnants of the departed glories of Rome were realistically portrayed, and were found specially interesting. St. Peter's, Rome, the famous leaning tower of Pisa, the delights of gliding along the numerous waterways of Venice, and a hundred other fascinating subjects were ably commented upon, many laughable anecdotes being related of personal adventures and of the curious customs of the people. In conclusion, Mr. Fenton-Jones advised those who intended going for a similar tour to take at least three months over the journey, for justice could not be done to the various places, and the sights could not be properly appreciated in a hurried and shorter visit.

Bristol Camera Society.—March 22, Mr. John Fisher in the chair.—Mr. M. E. Dunscombe lectured on *Photo-micrography*. The lecture was ably illustrated by practical experiments, showing how any photographer who possessed a microscope might make pictures from his slides of almost any size he desired. Mrs. Cronk proposed a vote of thanks to Mr. Dunscombe. Mr. Harvey Barton, in seconding, who has kindly consented to act as President of the Society, described how he worked at the subject more than twenty-five years ago.

Glasgow and West of Scotland Amateur Photographic Association.—March 5.—Mr. S. Herbert Fry demonstrated the Paget Prize Plate Company's printing-out papers and lantern plates.

March 19.—Five new members were elected. Mr. William Goodwin read a paper on *Stereoscopic Photography*, in which he described the requirements of stereoscopic photographs and the methods of making them, both with ordinary and twin-lens cameras. He explained the functions of the stereoscope, and exhibited various forms of the instrument. He then showed the method of mounting stereoscopic prints, and made a stereoscopic transparency, using an ordinary printing frame with cardboard guides.

March 21.—A Lantern Lecturette Competition was held in the rooms of the Association. The conditions were: Lantern slides not fewer than twenty, or more than thirty, with descriptive lecturette not to exceed thirty minutes in delivery. There were four entries, as follows:—*A Trip to Inverness with a Camera*, Mr. Robert F. Linn; *The River Clyde*, Mr. A. Lindsay Miller; *Through Perthshire with a Caravan*, Mr. John Morison, jun.; *Picturesque North Devon*, Mr. Ralph H. Elder. The lecturettes were delivered in the above order, as determined by ballot, and at the close a vote was taken as to their merits, when it was found that the first prize, a silver medal, had been awarded to Mr. A. Lindsay Miller, and the second, a bronze medal, to Mr. Ralph H. Elder.

Photographic Society of Japan.—February 9, Mr. W. K. Burton in the chair.—Mr. K. Ogura showed plain collodion that he had prepared himself, the supply both of plain collodion and of pyroxyline in the country having fallen short. He had prepared the cotton himself, and it made a clear, smooth solution, excellent for enamelling, stripping, and like purposes. He also showed some bleached lac solution. He had found the bleached lac of commerce insoluble in alcohol; but taking brown shellac, bleaching it with chlorine, and treating it with alcohol at once, he had found it readily soluble. It soon tended, however, to become insoluble. A Steinheil tele-photographic lens had been sent to the meeting by Messrs. Mosle & Co. The lens consisted of an extra-rapid aplanat, working with an aperture larger than *f*-6—in fact, No. 2, Great Britain standard—with a focal length of about fourteen and a half inches, the lenses closer together than is common, and with the diaphragm slit quite close to the front lens. To this was attached a negative element of nearly the same diameter as the aplanat. The Chairman showed comparative results of exposures with a long-focus single lens, Steinheil's tele-photographic lens, and Dallmeyer's tele-photographic lens, all taken from the same position, and with the same extension of camera. The Steinheil lens gave an image much larger than the single lens, and admirably clear and sharp. The Dallmeyer lens gave an image quite as much larger than that given by the Steinheil lens as the latter was larger than the image got by the long-focus lens. The Steinheil lens was more rapid than the Dallmeyer with the same extension of camera, but less rapid with an extension necessary to get a like amplification. The Steinheil, giving a less amplification than the Dallmeyer, was naturally easier to use. In fact, a comparison between the Steinheil lens and the only Dallmeyer tele-photographic lens that the Chairman possessed was not a fair one. Dallmeyer had recently introduced a tele-photographic lens for moderate amplification which he (the Chairman) hoped to be able to bring before the next meeting. A comparison between it and the Steinheil tele-photographic lens would be instructive. The Chairman also showed comparative results of prints made in the ordinary way, in contact with the negative, and those made by doing part of the printing in contact, and part with a plate of glass inserted between the negative and the paper. The result

is a softening, which is not actual blurring, inasmuch as a perfectly defined image is superposed on an ill-defined one. The effect could be indefinitely varied by varying the relative times of printing with and without the glass between the negative and the paper, and by varying the thickness of the glass. The process was a very old one, having at one time been sold as a secret process for large sums of money. This seemed a suitable time to revive it, when the "Modern School" of photographers went in so much for—to put it as mildly as possible—"softness." There was some difference of opinion as to whether landscapes were improved by the treatment, but all agreed that portraits were. Mr. K. OGURA had analysed some of the "tabloids" that had been distributed at a recent meeting. He found that the "pyro" tabloids consisted of pyrogallic acid, sulphite of soda, and gum arabic. The "accelerator" contained potassium carbonate, potassium bromide, and gum arabic. The same gentleman showed prints on albumenised paper that has been only partially printed. They had then been cut in two, and in each case one half had been toned and fixed in the usual way; the other half had been developed by a weak hydroquinone developer, and had been toned and fixed in a special bath. The halves of the prints treated in the ordinary way were mere ghosts, the other halves were admirable in every way. They showed pure whites, an unusually full gradation, deep shadows, and were of a fine brown tone. It was considered that the process would be a most useful one for printing in dull weather, though dull weather is, fortunately, unusual in Japan.

FORTHCOMING EXHIBITIONS.

1894.

April 3, 4 ..... Rotherham Photographic Society (non-competitive).
,, 5–7 ..... *Aston Natural History and Photographic Society. Hon. Secretary, F. W. Pilditch, 133, Wills-street, Aston.
,, 13–28 ..... *Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 16–28 ..... *New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHERS AS DEALERS.

To the EDITOR.

SIR,—"Thirty Years' Professional," in the last number, is angry with me because I laid a finger on some of the difficulties in the way of the professional photographer being also the dealer, and, as a consumer, placing himself in the enviable position of buying goods for his own use at bottom prices, and supplying the public at a profit, a condition of things which does not prevail in any other industry. I can understand and appreciate your correspondent's chagrin, because no one likes, when indulging in dreams of self-aggrandisement at somebody else's expense, to have their remorseless impracticability and unattainableness exposed by an impartial onlooker. But "Thirty Years' Professional" had no cause to be stupid as well as angry, and need not have demonstrated the humiliating but miraculous fact, that it is possible for a man to have been in business for thirty years without having acquired a microscopical quantity of common sense.

If "Thirty Years' Professional" is so dense as not to know what is meant by an "average" professional, I fear that any extended exposition of the term would find him in just about the same condition of irreducible woodenheadedness, and I will pass on to his refutation of my charge of "apathy and helplessness." Says "Thirty Years' Professional," "The committee and other officers of the National Association of Professional Photographers scarcely come under this sweeping accusation." Granted, and cheerfully so; but what is the membership of the National Association of Professional Photographers? Something under two hundred, I believe. How many professional photographers are there in this country? One way and another, several thousands, I'm sure. And yet out of all this vast number not two hundred are found with spirit enough to band together for the purpose of obtaining "some better recognition than the manufacturers are giving them!" If this is not apathy and helplessness, in the name of goodness, what is it?

My critic takes exception to my prophecy that combination among professionals will not work out in practice, and wants to know who told me. Nobody. I am not (and nobody else but "Thirty Years' Professional" is) in need of information on the subject, for my "prophecy" is an inevitable deduction from clearly recognised facts. Photographers *have* not and *do* not combine, therefore there cannot be the slightest prophetical risk in saying that they *will* not. I hope most devoutly that I am mistaken, but—what has been the history of the National Association of Professional Photographers, the Benevolent, the Photographic Society of Great Britain, the Copyright Union, the Convention, and other attempts to help the photographer and improve his status? All, all, so far as the professional is concerned, must come under the category of hopelessness enshrined in that bleak and dismal word, "Failure."

I am not a manufacturer, but I have a large knowledge of the trade and of the photographic profession, and I should not be (as I trust I am) a true friend and well-wisher of the latter if I did not assault the fatal fallacies into which the ignorance of "Thirty Years' Professional" has led him. The entire case is in a nutshell. By the conditions of modern photographic trade, there stands, nay, there *must* stand, between the manufacturer and the consumer, a middleman or distributor. That consumer pays or should pay a fixed retail price. But a fourth party, the photographer, steps in and says: "I use such-and-such goods for trade (virtually manufacturing) purposes; I am entitled to buy cheaper than the man who does *not* employ his purchases in the way of trade." Nobody would dispute the photographer's right to such terms. "But," says he, "I also want to be a distributor or middleman, and make a second profit other than that of my own profession." The manufacturer says, "No; you are not a distributor or dealer, but a consumer, so that you are not entitled to the terms you are asking. Be a dealer right out, and you shall have them." Said I not truly when I remarked that photographers like "Thirty Years' Professional" wanted to hunt with the hounds and run with the hare? Photographers may have many injustices to allege against the manufacturers, but that is no reason why the latter should ill-use their best friends, the dealers. And, after all, what photographer I should like to know would ultimately bless the privileges "Thirty Years' Professional" is clamouring for? He would require to keep stock of infinite varieties of plates, papers, apparatus, chemicals, and hundreds of odds and ends, stand the risk of their being sold promptly, left on his hands, going out of fashion, giving credit, making bad debts—and all for what? A mere piece of silly sentiment. I fancy that, if "Thirty Years' Professional" and others could have their way, the last state of the professional photographer would be worse than the first.—I am, yours, &c.

March 24, 1894. COSMOS.

To the EDITOR.

SIR,—*Re* the question of dealers' and professionals' relations with the manufacturers, I should like to say a few words. I think the attitude of the manufacturer in declining often to appoint the chief user of his goods as his agent is both unique and unfair. A plumber, house painter, gasfitter, or similar trader buys direct from the makers at lowest prices, and, should he care to sell the goods he uses in his trade, the manufacturers are only too willing to supply him on good terms. The photographer buys from the manufacturers the goods he requires at a trivial reduction on a large quantity, or at full list prices. With the dealer he fares no better than the smaller amateur. Artists' colourmen supply professional artists at a large discount, twenty-five per cent. off list price being often given.

I am aware that some photographic manufacturers are more alive to dealing liberally with their best customers, but I think the majority are apparently set on bolstering up the middleman. For example, a certain large firm of dry-plate makers have in this town a chemist for their agent. During last season I was repeatedly asked for that firm's plates, and referred the applicants to the chemist. They invariably came back with the remark that the agent was out of plates, and bought some of the brand I use from me. Now, I had asked that firm some years ago if they would sell me their plates at a discount, so that I could supply amateurs. Reply: "We have an agent already in your town"—one who, by the way, doesn't spend 3*l.* a year with them. Yet, rather than they would supply me, a professional photographer, they would practically prefer to sell none here.—I am, yours, &c., J. MARTYN.

The Studio, Southwold, March 17, 1894.

THE BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—It is evident that your correspondent "F. J. A." has not made himself acquainted with the history of the Photographers' Benevolent Association, or he would not have written with such confidence of the support it would be likely to receive from the photographic profession were it a "Benefit" and not a "Benevolent" society. As a matter of fact, it was a benefit society, from its establishment in 1873, until a very few years ago, in the sense that subscribers only were eligible to receive benefit from its funds, and it was entirely owing to the small support it had received from the profession that a change was made in its constitution, and its funds were made available for the assistance of photographers generally. The sole reason for reconstruction was the fact that then, as now, the class which was most likely to require its help held aloof from it. The alteration was not made without mature consideration, nor before every effort had been made to increase its membership roll. The subscription was at first 10*s.* 6*d.* per annum, but this was reduced to the nominal one of 2*s.* 6*d.* Even this was not sufficient inducement to photographic assistants to join in any number, although it was, and is, obvious that, taking into consideration the proportion of the entire receipts which is contributed as donations, an assistant, or any one connected with photography, who is dependent for a living for a weekly wage,

which may, at any time, cease through illness or misfortune, could hardly have a better investment. At half-a-crown a week it takes forty years to subscribe 5*l.*, so the risk is not a very great one.

I am glad you printed "F. J. A.'s" letter. The more grumbles we have publicly expressed about what the Association *might* do, the greater publicity will be given to the work that the Association actually does. The Committee have almost given up appealing to the class which *ought* to subscribe. Their attempts at forwarding the work of the Association in this direction have been disheartening in the extreme. The expenses are not great, and the bulk of them consists of those of postage and stationery. Labour of every kind is given gratuitously; if it were paid for, it would certainly not be worth while to attempt to collect the half-crown subscriptions, since a renewal of subscription is rarely obtained without more than one application, and frequently both labour and postage are wasted, for it comes not at all.

The Committee would welcome any practical suggestion with regard to their work. F. J. A.'s ideas might be practical if photographers were like many other classes of the community; but, unfortunately, it has been proved they are not. The Benevolent Association can only take things as they find them, and endeavour to do the best under the circumstances.

—I am, yours, &c.
ALEXANDER MACKIE,
March 24, 1894. *Chairman of Committee.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

RECEIVED.—Col. Gubbins, "Dried'un," "Black and White," "Plymothian," and others, in our next.

E. HOWARD JAQUES.—If you send it, you may depend upon receiving such advice as we are capable of giving.

R. OFFARD.—There is no doubt as to the origin of the markings. They arise from the plate not being rocked during the development.

F. R. B. S.—Sulphide of potassium, otherwise known as "liver of sulphur," will precipitate the silver from the tub of old hypo baths.

S. SIMES.—Cold purple-black tones on gelatino-chloride paper may be obtained by the use of a phosphate toning bath. See the formula in the ALMANAC.

C. E. V.—Refer to the announcement pages of recent numbers of the JOURNAL, and you will see that a business firm advertises to purchase old negatives, &c.

K. LESLIE.—The effect is due to the work, and not the paper. Try the effect of finishing the picture in the reverse light to that in which the major portion of the work was done.

J. MARTYN.—Nothing new on the subject has been published during the last few years. Possibly the press could be adapted for the work; but we should not like to give a definite opinion unless we saw it.

PLATINOTYPE.—Messrs. E. Fox & Co., Little Britain, we believe, supply such mounts from stock. If not, they will, no doubt, make them to your order. They would be quite short enough for the purpose required.

SYDNEY BRAKSPEAR.—It is simply a piece of impertinence, or it may be ignorance, on the part of the Vicar. There may be copyright in a photograph, but, as we have stated to another correspondent, there is none in an edifice.

H. LESTER.—Ordinary crayons are all that is necessary. If you fail with them, it is not the fault of the materials, but lack of skill in using them. We should advise you to obtain a few lessons in that class of work from a skilled artist.

PLATTON.—Possibly, by following the method of toning platinum prints as given in "Continental Notes and News" on another page, you may succeed in getting something more than a "mere dirty yellow stain." Your failure is not uncommon just now.

P. L. MARKS.—By means of a mixture of bichromat potash and sulphuric acid the metallic image may be removed—possibly altogether, as we have observed that a faint image is still left in the gelatine. What this image consists of is matter of conjecture.

T. W. HUNTER.—1. The extent of glass will be quite sufficient. 2. Ordinary sheet glass, as generally used for windows. 3. We prefer, for such a studio, blinds for the roof and curtains for the sides. 4. The light from the old studio will be of no use to the new one. The plan has been returned, as desired.

W. LENNOX.—The cause of the paper printing with the mottled or rather "rotten" appearance is that it was sensitised on a bath too weak in silver for the amount of chloride with which the albumen was salted. Three minutes' floating ought to be long enough for any paper, provided, of course, the silver bath is of sufficient strength.

F. A. BOURNE says: "I shall feel glad if you will state in your issue next week what date or dates in your back numbers you refer to the four-footed stand that is shown in the ALMANAC, p. 691, as I should like the dimensions, so as to get one made."—In reply: See the article on "Elevating the Point of View" in the JOURNAL for March 24, 1893.

NEGATIVE (Hanley) writes: "Will you be kind enough to tell me in what year of your paper I shall find the case I spoke of in my question a week or two ago—Clergyman *v.* Photographer—in which the photographer lost? I remember reading the case in one of your papers."—A report of the case and comments thereon will be found on page 739 of the volume for 1888.

R. E.—It seems to us that the clergyman's objection to your photographing the church was a valid one, inasmuch as it involved trespassing on his private property without having asked his permission to place the camera. He cannot prevent the church being photographed provided it is not done from his private grounds. No one can prevent the building from being taken from a public highway.

T. A. W.—It is the old tale. See answer to "Rosebery." Write a peremptory letter to the paper, saying that, unless the guinea be forwarded by return, action will be commenced at once. There can be no question about the copyright in this case. We have little doubt that they will remit when they see you are determined. Some of the illustrated papers have been "bluffing" photographers for too long a time, but, when they find that that is not accepted, they pay up.

ROSEBERY.—If you are the owner of the copyright, we see no reason why you should not recover; but you cannot take any proceedings until it has been registered. We should advise you to consult a solicitor who makes a speciality of copyright law before issuing process. Your experience is by no means exceptional with the illustrated press. You might write to the two papers named, and tell them that unless the fee named, when you forwarded the prints, is remitted forthwith, proceedings will be commenced. They will then probably send the amount.

S. A. writes: "I have often read that carbon transparencies, when they are too thin, can be intensified with permanganate of potash; but I cannot find anywhere what the strength of the solution should be, and how it should be applied. Will you please say?"—The strength of the solution is not of much importance. The stronger it is the quicker it acts, and *vice versâ*. About ten grains to the ounce of water is a good proportion. It is simply poured on the plate, and flowed backward and forward until the desired density is obtained. If the transparency has been dried, it should be wetted under the tap before the permanganate solution is applied.

T. DALY asks: "How do professional photographers varnish large negatives? The directions on the varnish bottles say: Warm the plate before the fire, pour on the varnish, flow over the surface, and drain off into the bottle, from one corner. The largest plates I have tried to varnish are the half-plate size, and I find it impossible to work in that way. The varnish naturally runs off at the edges, over the fingers, and on to the floor. It seems to me that the makers, in giving such directions, have only the idea of amateurs consuming or wasting the stuff."—The directions are quite right. Professionals varnish their negatives according to them, and do not waste the "stuff." A little experience is all that is necessary.

F. B. writes: "In reference to Lord Rayleigh's lecture on the optical discoveries of Newton, at the Royal Institution, and as printed in last week's number of THE BRITISH JOURNAL OF PHOTOGRAPHY, I notice two sentences which, if true, I consider should be fully explained. Lord Rayleigh remarks: 'Black, of course, being no colour at all.' How is this to be understood? Is white a colour more than black? Further on, the lecturer says: 'Blue and yellow do not make green, as popularly believed, but a pinkish grey.' I have tried this for many a time, but always got a green colour, never a pinkish grey."—In reply: 1. Black and white are not "colours"—that is, spectrum colours. 2. The lecturer, doubtless, refers to pure yellow and green.

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THE BRITISH

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EMULSIONS AS A SUBSTITUTE FOR GROUND GLASS.

As a radiator of transmitted light, ground glass is not by any means so successful as some other diaphanous materials.

If the flame of a candle be intercepted by a sheet of ground glass, this latter will be luminous only in proportion as the eye is directed in a more or less straight line from the source of light and the part of the ground glass which interposes. This is not so in regard to some other surfaces which we shall presently mention. Let us apply this to the case of the focussing screen of a camera, so constructed, as some hand cameras now are, as to necessitate the observation of the composition of the picture on the screen being made through an aperture, square or round, in the back of the case forming the walls of the camera, such aperture being of smaller dimensions than the ground glass.

Now, observe that, while the objects focussed on or near the centre of the screen are clear and bright, those at either side, and especially as the margins are neared, are so faint as, in some instances, to be scarcely visible at all. The light transmitted through the lens falls upon the margins at an angle more or less great in proportion as they deviate from the axis; and, as the examination of these oblique incidences must be made under analogous conditions, the result is that the light transmitted from the ground glass to the eye is so much attenuated as to be in a great degree invisible and inimical to marginal composition.

In an ordinary camera, in which nothing is interposed between the focussing screen and the eye, the head, when covered by the focussing cloth, can be moved all over the surface from the centre to the extreme margin, the eye then roaming over the various portions of the composition, and seeing them under conditions of practically equal illumination.

We are not here finding fault with ground glass as a means for obtaining a sharp focus, but as an effective agent for showing the whole composition of a picture at a glance when viewed from a point opposite the centre of the screen, and that at no great distance from it. For obtaining a sharp focus fine ground glass answers every purpose; the best lenses are now so well corrected for flatness of field that, if perfect sharpness is secured in the centre of the field, the sides may be left to take care of themselves. What is wanted is a screen that, when looked upon obliquely, shall so radiate the light as to permit the image to be seen better than it can be by the ground glass.

Some years have elapsed since, when trying experiments to discover the best backing for stereoscopic transparencies, it was found that ground glass was the least best of all the substances that were subjected to trial. In order to see these transparencies under circumstances of good illumination, it was necessary that the stereoscope should be directed straight towards the light. This, together with the granular appearance imparted to fine delicate renderings of detail, especially noticeable if the ground glass is in near proximity to the picture, renders a backing of this nature the worst that can be adopted.

But it is not with this latter that we have to do at present. The requirement is a means of arresting the light, with a greater power of diffusing or radiating it than is capable of being obtained by ground glass. Happily, this is attainable by an emulsion composed of collodion or gelatine and one or other of a variety of white pigments mixed in intimate union. Collodion, when it can be protected from such tear and wear as will cause abrasion, is undoubtedly the best, but, when employed in providing a substitute for the focussing screen, it fails, in consequence of its liability to destruction. This is not the case when gelatine or isinglass forms the medium. The latter of these in particular gives a hard, transparent, tenacious film capable of being roughly treated without showing signs of such treatment. An emulsion of isinglass and oxide of zinc, when flowed over glass and allowed to dry, forms an admirable backing for a transparency or, what is more to the point of this article, a coating to a focussing screen.

But there are even better pigments than the zinc. Carbonate of lead, known in commerce as flake white or white lead, we have found to be superior. Some samples of the commercial carbonate are more opaque than others, but for coating a glass to be employed as a focussing screen it is somewhat immaterial whether it is quite pure or not.

For those desirous of backing a transparency in the most perfect manner possible, we recommend the manufacture of the lead salt each for himself, for it is an exceedingly easy operation. All that is necessary is to make a solution of either nitrate or acetate of lead, and add to this a solution of carbonate of soda, by which the lead is precipitated in the form of carbonate. This precipitate is washed first with water and then with alcohol, and is then added to plain collodion, with which it is well shaken up. One or two trials, by coating a plate of glass, will determine whether too much or too little has been added. There are other whites which answer well, among these being pearl white, sometimes sold under the name of Fard's Spanish white (the trinitrate of bismuth); alum white (Baume's white); and similar preparations.

A focussing screen we have made in accordance with the foregoing has afforded us the most complete satisfaction for use under the conditions described.

COPYING ENGRAVINGS BY CONTACT.

It not unfrequently happens that a copy is required of an engraving or document, and possibly at short notice. It may be that the trouble involved in the process of copying by means of the camera will outweigh the advantages to be derived; and the matter is consequently dropped, whereas, if a simple and easy method were available, it would be adopted.

It was under such circumstances that a few days ago we saw a job of this description undertaken and successfully carried through. The subject was an engraving bound up in a bulky volume, the picture itself measuring some twelve and a half by ten inches. A copy was required, the dimensions being immaterial; but, to save the trouble of fixing up the camera, with all the attendant precautions necessary to secure "rectilinearity," it was decided to perform the operation by contact printing direct on to a sensitive film. The idea is by no means a novel one, but its utility is such that we think the details of the process will bear narration.

A sheet of "Nikko" paper—that being the particular kind that came readiest to hand—was placed in contact with the face side of the engraving, and, a sheet of plate glass having been laid over it, the book was carried out into daylight, and exposed for forty-five seconds to a good diffused light. It may be remarked that the particular brand of paper was not selected on account of any special fitness for the work, but simply because it was at hand. Most probably one or other of the bromide papers would be preferable, or, better still, a negative paper or film. However, in this instance, the "Nikko" paper performed its duties with complete satisfaction.

After exposure the paper was thoroughly soaked in water, and then flooded with a developer consisting of amidol and sodium sulphite of the ordinary strength employed for negatives, with the addition of one grain of potassium bromide to each ounce of solution. The image was slow in making its appearance and progressed very gradually, but with patience worked up to printing density without any necessity for forcing by the addition of alkali, the lines of the picture remaining throughout perfectly clear and free from stain. Further than that, it may be said that in the finer portions of the engraving the lines were clearer and showed less tendency in the direction of "filling up" than would have been the case if the engraving had been copied in the camera.

Those who are familiar with the work of reproduction of line subjects are, of course, aware that the clogging or filling up of the lines is, to a great extent, due to the action of reflected light—light reflected from the ink surface, though, at the same time, some portion of the effect is traceable to the spreading action of the developer in the film itself. In the case of reproduction by contact there is, of course, an entire absence of the reflected light, and the troubles are narrowed down to those which belong directly to the film and developer; and, provided the subject is printed in sufficiently good ink, and the paper is of fairly even texture and free from stains, the results obtainable by direct contact printing are, for most purposes, fully equal to those obtained with the aid of the camera, and with far less trouble.

For such purposes as require the very greatest degree of density and clearness in the lines—for photo-zinco and litho processes, in fact—we have never used this method of negative-making, though, in the course of the last five-and-twenty years, we have made many negatives which have printed with the best results on albumen, carbon, and, more recently, gelatino-chloride papers. The only departure it is necessary to make from the ordinary course of negative development is to see that the solution is well restrained, and that it acts slowly and regularly. The heavier portions of the engraving should remain throughout development strong and clear, without any sign of fog or veil; indeed, even in the most delicate portions of the lights, the details should be clearly distinguishable under close scrutiny, even in the dark room.

We have suggested that probably other papers than "Nikko" would give as good, or better, results, but from actual experience we are able to say that ordinary albumenised paper is capable, when employed in the same manner, of giving the most beautiful results in the way of reproductions of line work. In fact, where the length of exposure is not an objection, the very best results, both as regards clearness of lines and printing density, are undoubtedly obtainable with albumen paper.

COLOUR OF AMMONIA-PYRO NEGATIVES.

The expression "wet-plate character," as applied to gelatine negatives, is little more than a meaningless tradition in the ears of a large body of modern workers; yet the time was when to obtain a negative of this type was the aim and the ambition of the majority of workers. When it was seen to be difficult of attainment, the opinion was put forward that the sickly yellow that distinguished the early plates was a distinct gain in printing, and so pleasant a salve to the conscience was adopted with avidity, and the majority of those who referred to the matter joined in the cry that such negatives were to be preferred. Next came the introduction of sulphite of soda into the developer, with, at first, its complete disregard, and gradually its adoption, by almost every photographer. Then it was discovered that the yellowness had not the advantage claimed for it, and only such an amount of yellowness was permissible as the use of a not over-large proportion of this salt involved. But, ever since the introduction of sulphite, there has been a growing tendency to revert to the old opinion that "wet-plate character" was, after all, a desirable effect, and many have so adapted their formulæ as to bring their plates into as near an approach as possible to the type. Possibly the great popularity of lantern slides, which are nothing if not crisp, clear, and free from stain, has affected public opinion; but, be the cause what it may, there is little doubt about the tendency, and it is our purpose here to show how it can best be brought about with least trouble or disarrangement of ordinary dark-room methods.

The foremost place must be given to the employment of an acid hypo bath, though, as far as we can gather, it is not adopted by any large body of workers. Why this should be so we are unable to say, but it is probably owing to the supposed trouble involved in using several different substances, which have to be dissolved and added, thus taking time and trouble. When the end in view is considered, this would seem to be a very inefficient cause, yet practical men know how such considerations will affect the practical working of a variety of hobbies besides that of photography, in which latter labour has been so much lightened to the plate-user that he, in so many cases, resents anything that is much beyond "You-push-the-button,-we-do-the-rest" mode of working. But, after all, there need be little trouble in the acid bath. Our own practice tells us that Mr. W. B. Bolton's original suggestion of acidifying a neutral sulphite solution is in every way equal to the

plan of using mixed solutions of neutral sulphite and acid sulphite. The mode we employ is simplicity itself. Always keeping on our shelves, as is our practice, a stone bottle of sulphite of soda of definite strength, it is only needful, when mixing a fresh fixing bath, to take such a portion of this solution as will contain one-tenth as much sulphite as there are hypo crystals to dissolve. Then, while this dissolution is taking place, we add to the sulphite solution a small quantity of dilute sulphuric acid (kept in a bottle for this purpose), until there is a distinct, but not strong, smell of sulphurous acid. When the hypo is dissolved, this acidified solution is added to the liquid, and the acid fixing bath is ready. Its properties are such that all negatives passed through it have very little of the pyro yellowness. Two precautions are necessary. First, it must not be supposed that it will answer for an indefinite number of plates; it will keep in good order longer than the ordinary hypo, but, after a while, even if not much discoloured, it seems to lose its colour-discharging power to some extent. Secondly, it is essential that the sulphite solution be not made too acid, otherwise there will, during fixation, be deposited upon the plate a slight scum of a gritty texture, fatal to surface when retouching is to be done, and, in any case, objectionable, as it is most probably a precipitate of sulphur.

But the acid bath is not alone to be depended upon; to get the full value from it, the developer should also have a sufficiency of sulphite in its composition; and here it is that mistakes most frequently happen. We have gone into this question very closely, and we unhesitatingly say that with plates of the thickness of film now becoming general it will be impossible to get the full effect of the salt if less than four grains to every grain of pyro be used. But this is not all: the proportion of sulphite to be used is not to be governed by the pyro alone (we are now speaking only of pyro-ammonia developing), it must be governed rather by the ammonia. If we take, for example, a normal developer containing half as much strong ammonia solution as of pyro, we may, with many plates, have all we could wish; but, the moment it is found needful to add more ammonia for under-exposed plates, we get yellower negatives. To avoid this, considerably more sulphite must be added, and, as at this stage of development the trouble of adding something else beyond the ammonia may be embarrassing, such addition is often not made, and negatives forced in the development are yellow. The simplest way to avoid this is to keep the ammonia in weak solution by adding the strong "liquor" to a solution of sulphite instead of water. It keeps as well, is easier to employ, and ensures that with every addition of ammonia there simultaneously goes with it the requisite amount of sulphite. In conclusion, we may say, that in working the way we suggest and employing the acid fixing bath, wet-plate character will distinguish every negative or transparency so treated.

Large Rock-salt Prism and Lenses.—Mr. Brashear is making for the Smithsonian Institution a rock-salt prism and set of lenses which, when completed, will probably be the largest optical train yet constructed of this material. The 60° prism is seven inches high, and the width of each face is five inches. The lenses are seven inches in diameter. While the prism is not perfectly free from flaws, the loss of light from this cause will hardly be more than five per cent., and the lenses are even clearer than the prism. All three pieces were cut from a block of rock-salt which formed part of the Russian mining exhibit at Chicago.

Spring Effects.—The country, so far as foliage is concerned is certainly in a very forward state for the time of year, and, if the meteorological conditions continue as they are, there is the prospect of not only a very early spring, but one of short duration; hence those who desire to obtain spring effects must be on the alert to secure them as the opportunity occurs, or they will have to wait another year for them. There are many subjects that will make charming pictures if taken when the leaves are young, but at no other time. If taken when the trees are bare, the scene will appear barren; if taken when the leaves are at the full, the main portions of the subject will be obscured. Notably is this the case with some old ruins that are surrounded by trees and shady glens. Fruit-trees in blossom, as well as the horse chestnut, with its stately bloom, form charming subjects for the lantern, but the time for securing them in perfection is very limited, and this year promises to be more so than usual.

Fine Art in the City.—On Saturday last the Lord Mayor formally opened a loan exhibition of pictures at the Guildhall. This year's show is pronounced one of the richest, if not the richest, the Corporation has yet held. It certainly is the most representative, as it includes examples of nearly every school, which have been contributed from some of the finest galleries in the country, including some from those of the Queen. Photographers who may be essaying *genre* subjects will do well to study some of the Dutch pictures, particularly a very fine Jan Steen. In the collection are some very excellent examples of landscapes, both of the old and modern schools, that are especially worth the attention of photographers. As the pictures are from private collections, this is, perhaps, the only occasion that the public will have the opportunity of seeing them; therefore the privilege should not be lost. A strenuous attempt was made by some of the promoters of the Exhibition to have it open on Sundays, but it was defeated after a prolonged and acrimonious discussion. This is a subject for regret with many engaged in photography.

The Dublin Convention.—Mr. F. P. Cembrano, jun., the Honorary Secretary, writes: "I beg to inform you that this year's meeting of the Photographic Convention of the United Kingdom will take place in Dublin, during the week beginning on July 9 proximo. The proceedings will be opened by a conversazione, which promises to be very largely attended by representatives of all the Dublin scientific societies and kindred bodies, and will be held in the rooms of the Royal Dublin Society. The Convention meetings and Exhibition will be held in the Large Hall of the Photographic Society of Ireland, 15, Dawson-street. Numerous excursions to places of interest in and around Dublin will be arranged, and there will also be longer-distance excursions to the scenery of County Wicklow, the Vale of Avoca, and the pre-historic remains of the Valley of the Boyne, with its Celtic crosses and caves. It is also probable that marine excursions will be the means of viewing the beauties of Dublin Bay, so justly compared to the Bay of Naples, and it is also likely that entertainments and receptions will be given under special patronage. The annual subscription, five shillings, is now due."

Close of the Lantern Season.—Photographic societies are now bringing their lantern meetings to a close for the season. Most of them have already done so, and the members—many of them—are even now securing early spring effects to show next season. A word of advice to lantern owners just now may here not be out of place, particularly to those who employ mineral oil as illuminants. It is this: Thoroughly clean all the parts of the apparatus before it is stowed away. In the case of oil lanterns, the oil should be closely drained from the reservoirs, the wicks removed, and the tubes carefully wiped out with strips of clean rag. The reservoirs, after draining, should be similarly treated; indeed, the whole of the fittings should be thoroughly freed from every trace of oil. All this will take but a few minutes, and it will save a deal of inconvenience in the form of cleansing and offensive odours when the lantern is next brought into use. Petroleum oils, or, indeed, any

other which have been allowed to remain for months about the fittings of lanterns, become very difficult of removal, and, unless they are completely removed, when they get heated, they emit exceedingly unpleasant fumes, which are very persistent in a room.

Variation in the Speed of Shutters.—"March dust," says an old adage, is worth a guinea a bushel, but it is often an unsuspected source of trouble to the hand-camera worker by causing a variation in the speed of the shutter. There are few shutters that would not be influenced, more or less, the former rather than the latter, by a few particles of road grit in the working parts, and the more delicately they are constituted the more readily will they be affected. A shutter which, in its ordinary state, will work in, say, the fiftieth of a second, may, if the camera be carried unprotected for a mile or two along a dusty road, have its speed very considerably reduced, probably one half or more. We were forcibly impressed with this fact on seeing a party of cyclists, evidently a club, two or three of whom had hand cameras attached to their machines, careering along a dusty road on the recent Bank Holiday. The machines and their riders were covered with dust, and so were the cameras. Those who know how road dust, when raised, permeates almost everywhere, will realise the effect it must have had on the rate of the shutter in this instance.

Art and Photography.—Art seems to be receiving much greater attention at the hands of photographic societies at the present time than it ever did in former days. This is a healthy sign. At a recent meeting of the Richmond Camera Club Mr. Horsley Hinton descanted on the *Art Side of Photography*, and, at the North Middlesex Photographic Society, Mr. Pither gave a lecture entitled *Gleanings from Picture Galleries*. The latter was illustrated with a large series of engravings from the pictures by different masters, also by the use of the blackboard. How very much more valuable would have been the lecture had it been illustrated with photographs taken from the originals, and projected by the aid of the lantern on a screen, so as to be seen by the whole of the audience! Excellent photographic copies of the old masters, in the various English and foreign galleries, are published by some Continental houses, but not as lantern slides. This is to be wondered at, as they would be most useful in art teaching. One reason assigned for this is that the lantern is not nearly so popular abroad as it is here; another is, that, if the copies were issued as transparencies, they could the more easily be pirated, and, as the copies were only obtained at great expense, they will not entail the risk of their sale being injured in that way.

Chlor-aurate of Silver.—Chlor-aurate of silver, $AgAuCl_4$, an interesting compound of the very soluble and deliquescent chloride of gold with the particularly insoluble chloride of silver, is described by Dr. Hermann, of Aschaffenburg, in a recent number of the *Berichte*. This compound has formed the object of previous unsuccessful researches, but its preparation is very simple when the necessary conditions are known. Four parts by weight of metallic gold are dissolved in aqua regia, and the solution evaporated over the water bath, until upon cooling the resulting chlor-auric acid, $HAuCl_4$, crystallises. One part by weight of silver dissolved in dilute nitric acid is then added, when silver chloride is precipitated in its usual form. Upon repeated evaporation of the whole with concentrated nitric acid containing a trace of hydrochloric acid, the silver chloride changes, becoming coloured bright red, and eventually is completely converted into a mass of crystals of silver chlor-aurate. The crystals are long prisms terminated by pyramids and dome faces; they appear to be coloured bright orange-red when singly examined by reflected light, but are pure yellow by transmitted light, and the finely powdered substance reflects bright yellow light. It is interesting to note that, when enclosed in a sealed tube containing perfectly dry air, the compound is quite stable and unaffected by bright sunlight, but the moment it is exposed to sunshine, in ordinary moist air, it commences to bronze, and eventually becomes superficially coated with a dark bronze metallic coating. Dilute hydrochoric acid instantly decomposes it with formation of silver chloride and a solution of chlor-auric acid. Ammonia, on the other hand, decomposes it with production of the usual ammoniacal solution of silver chloride and deposition of fulminating gold.

UNIFORMITY WITH GELATINO-CHLORIDE PAPER.

While the discussion on the question of uniformity of results with gelatino-chloride paper is proceeding, it may be as well to look at one possible, nay, probable, cause of uncertainty that seems hitherto to have been entirely overlooked. Various toning baths, the use of alum, neglect to keep the paper properly dry, and various other reasons have been suggested, in all which cases the user of the paper is supposed to be the delinquent; but may it not be that the maker may be at least as much in fault?

Let it be clearly understood that I do not wish to impeach the quality of the commercial article so far as I am acquainted with it. On the contrary, I have used little else during over twelve months in my own printing, and have seen a good deal of the results produced by others, and have been surprised at the general good quality, which I believe to be far higher than would have been the case if albumen papers or indeed any other process, had been in question. The one point I have any fault to find with is that of uniformity of tone, and here I think the manufacturer is to blame quite as much as, if not more, than the consumer. As much, because he is in a measure to blame; more, perhaps, because he places the user in a position of inability to help himself.

I suppose every one, be he amateur or professional, has a fancy for some particular tone, and, if he take any pride in his work, he likes to preserve uniformity. Of what avail is the individual good quality of the prints if a dozen of them show as many variations in colour? What chance would a frame of portraits or landscapes have at an Exhibition if they ranged in colour from brown to grey, from purple to black? Yet this is the result frequently obtained with the same brand of paper, though the toning and other conditions may be all precisely similar.

Only a few days ago, in conjunction with a friend, I toned a large batch of prints in two sizes, and necessarily from different packets of paper. It is needless to specify the brand; suffice it, it is one of the highest repute. Before toning, the prints were practically indistinguishable in general character, and only varied to the extent that some were a little more deeply printed than others.

But in toning it was found impossible to bring the two different-sized prints to the same tone, one set would not pass the purple stage without reaching the blue; the other, without touching a decided purple, went direct to black, and, to make matters worse, the purple prints went down about twice as much in the fixing bath as the others, and proved almost without exception under-printed when finished.

This was not a case of accidental variations in printing and toning, for the two sets of prints which were developed in the same bath were as easily separated by their colour into sizes as if one set had been untoned; they were toned, as regards order, indiscriminately as they came to hand, and the earliest of the batch presented precisely the same characteristics as the latter. I may add, that either paper was of a quality to give the very best results when its peculiarities were known, but to work the two together was utterly fatal to uniformity.

Now, I take it that this is an instance in which the user of the paper is practically helpless, and cannot be blamed; for, if each batch of emulsion is liable to vary slightly in its character, how is he to be aware of the fact. In the case I have quoted the two sets of prints were, as already stated, practically the same colour before toning; but who that has used gelatino-chloride can have failed to notice the wide difference that frequently is shown in the colours before toning, and that, moreover, although the paper may be in each case perfectly dry? Damp, we know, tends to cause a variation in colour; but, with the particular brand of paper I chiefly use, I am sorry to say I am acquainted with several shades and variations in colours, from a foxy red to rich purple.

By suitable treatment these different preliminary colours can generally be brought fairly well together in the toning bath, and I admit the experience detailed above is the first I have had in that direction, at least in such an aggravated form; but, if the difference in colour exists at all, it is evident there must be some difference in the composition and nature of the sensitive coating. I may say that this variation in printing colour is not confined to any one particular make of paper, but can be noticed with all that I have tried of the market articles. It would, perhaps, not cause much surprise in the home-made product.

It is eleven or twelve years since I first began to seriously experiment with so-called gelatino-chloride paper, by which is usually meant a chloride of silver paper containing also an organic salt of silver. There are a dozen, perhaps a hundred, different ways of preparing the emulsion, any of which will give a good result; but it is not quite so easy to find one which will, in repeated batches, give precisely the same result, even though the same formula and routine be closely followed in every case. The difficulty exists with ordinary negative emulsion, but it is far less in that case than with the print-out chloride preparation, the chief causes of variation in the former case being in connexion with the temperature of "cooking."

Now, with the positive emulsion, the conditions are altogether different, for, instead of the sensitive film consisting, when finished, of an entirely insoluble salt—bromide, chloride, or iodide of silver, as in the dry plate—there is also in combination an organic salt, which, as a rule, is more or less soluble and in the case of citrate of silver, fairly, if not very, soluble in water. Add to this, it is absolutely essential that, for "printing-out" purposes, the emulsion must be subjected to the action of a soluble salt of silver during some portion of its preparation, if, indeed, it is not equally necessary that it should remain at the time of printing.

I read a statement some little time back by an individual interested and experienced in the manufacture of gelatine paper, to the effect that, in the preparation of the gelatino-citro-chloride emulsion, it is allowed to set, and is then washed in the same manner as an ordinary bromide emulsion. I can hardly think that this is the general practice, for, if it is, it fully explains any irregularity in subsequent working. I cannot think it is the general practice, for, if it were, my own experience has taught me that it would be scarcely possible to get any results that were at all worth having unless, after washing, the emulsion were reorganified; for the effect of the washing would be more or less, according to its extent, to dissolve out the organic salts that give the emulsion its "printing-out" qualities.

As a matter of fact, there is no necessity for such washing, the presence of the organic and soluble matters that would be fatal in a negative emulsion are absolutely necessary in the positive, and their presence is in no way detrimental to the keeping qualities of the paper if properly preserved. I have kept such paper containing, in the film, a considerable excess of soluble silver and other salts, and it has been, after the lapse of many months, whiter than some commercial samples when they come from the dealer.

But the more likely cause of irregularity in the behaviour of the finished film is to be found in the emulsion itself, even when made to a definite formula without subsequent washing. From its very nature, containing, as it does, soluble silver salts liable to combine with the gelatine, as well as to act upon and modify the insoluble haloids, it is obvious that any variation of the time between the sensitising of the emulsion and the drying upon the paper must have a greater tendency to alter the final result than is the case with an emulsion containing only insoluble and comparatively inert matter.

It follows, also, that variations in temperature, both by hastening or otherwise the chemical changes going on in the emulsion and by accelerating or retarding its drying, must have a dangerous action in modifying the final printing result. Bearing these facts in mind, it is perhaps surprising that the commercial papers are as uniform as they are rather than they are not more so; but, until the makers choose to adopt a process that will remove the disturbing causes I have mentioned, it is hardly fair to lay all the blame on their customers.

With regard to the matt-paper controversy, I have prints on Obernetter's matt paper that must have been made four years ago, without, of course, squeegeeing on to glass, and they will compare favourably with any of the glossy papers for fineness of grain and general brilliancy. *Apropos* of the difficulty in getting a matt surface, it is not so much a matter of reducing the quantity of gelatine, or thinning the emulsion, but, as has been stated, of selecting a suitable paper, which is, perhaps, more difficult on a commercial than on a private scale.

W. B. Bolton.

TONING AND INTENSIFYING PLATINUM PRINTS: PROCESSES WITH GOLD AND SILVER.

We subjoin the text of Mr. A. W. Dollond's paper, read before the Photographic Society of Great Britain, on *A Method of Modifying Platinum Prints by After-treatment*:—

The process which I have to demonstrate is the outcome of some experiments made with the object of discovering a method of intensifying platinotype prints by depositing upon the developed image a further quantity of metal. At the outset it appeared to me advisable, in order to avoid any risk of detracting from the stability of the prints, to confine my attention to the permanent metals, and my experiments so far have been made with the two better-known examples only, viz., platinum and gold. As regards platinum, the results I have obtained have not been sufficiently decisive to be worth communicating. It is, therefore, with gold alone that I have to deal.

Some preliminary experiments were made with the ordinary gold toning baths containing borax or sodium acetate. The results were, in a measure, promising, as the image became in time perceptibly strengthened, showing that there was some slight attraction on the part of the platinum in the print for the deposited gold. But many hours were required in order to effect any change, the colour was disagreeable, and the print was badly stained all over. Baths containing gold sulphocyanide gave no better results.

Next, trials were made of depositing gold on the print by reducing gold chloride with such feeble reducing agents as sulphites, oxalates, organic acids, and pyrogallol, and other developing agents in a strongly acid condition. No useful result was obtained in any case. Whether the gold was deposited quickly or slowly, it appeared to have no distinctly marked attraction towards the platinum image, and did not perceptibly adhere to it.

I then used, as reducing agents, various organic compounds of a glutinous nature, such as gum, glycerine, sugar, treacle, and glucose. Several of these employed in a faintly acid condition gave promising results; glycerine, especially, answered well. The reducing action of glycerine alone upon gold chloride is very slow; no metal is deposited for ten or fifteen hours, but, when applied to a platinum print, the metallic platinum in the image, by its attraction for the nascent gold, hastens the action, and the gold chloride is then reduced in a few minutes. Under these conditions the metallic gold adheres closely to the platinum. The viscosity of the glycerine appears to play an important part, possibly by acting as a mechanical check on the rapidity of the deposition of the gold.

The first action of the toning solution on the print is to increase slightly the strength of the image without changing its colour very much; but, as more and more gold is added, the colour becomes first blue-black, and finally almost blue. If the original image is at all brownish in colour, the effect of slight toning is to convert it into a pure black. Unless the toning is continued to an extreme extent, there is very little tendency for the gold to be deposited on those parts of the print where no platinum is present.

The first prints prepared were toned to the required extent, and then simply washed and dried. I found later, however, that simple washing was not in every case sufficient to remove all the gold chloride from the paper, for, after keeping some weeks, a few of the prints showed a pinkish tinge in the high lights. It is probable that the gold chloride may, if left for any considerable time in contact with the size in the paper, form a compound of some description with it, and is then not removable by washing. Even rinsing the prints, after toning, with weak hydrochloric acid did not entirely prevent the pink colour appearing. The simplest means of ensuring the absence of any gold compound which would be liable to change appears to be to treat the prints after toning and slight washing with an alkaline developer, so that any gold remaining will be completely reduced to the metallic state. After this treatment, a moderate washing to remove the developing solution should render the prints quite free from any tendency to change. None of the prints I have prepared in this way have shown any sign of alteration.

The solutions required are:—

1.

Gold chloride	15 grains.
Distilled water	7½ drachms.

Neutralised with chalk, filtered, and one drop of strong hydrochloric acid added.

2.

Glycerine.

3.

Sodium sulphite	1 ounce.
Water up to	10 ounces.
Metol	50 grains.

4.

Potassium carbonate	1 ounce.
Water up to	10 ounces.

The following is the method of application:—

The platinotype print, developed, cleared, and dried in the usual way, is soaked for two or three minutes in water, then laid upon a flat surface, preferably a sheet of opal glass, and blotted, to remove the excess of water. Next, glycerine is gently spread over the whole surface of the print with a soft brush or the finger-tip. When evenly coated, a few minims of the gold solution are dropped on, and rapidly mixed with the glycerine with a soft camel's-hair brush. Very soon the print will begin to gain in strength and assume the blue-black colour. During the whole time the toning is proceeding, the surface of the print should be brushed lightly and quickly in order to ensure even action, and to constantly bring fresh gold chloride into contact with the platinum image; also there seems to be less tendency for a deposit to be formed on the high lights if the solution is kept in motion. The high lights should be watched, and as long as they remain clear the action may be allowed to continue. When the desired effect is obtained, or when any colouration is seen in the high lights, the print should be quickly rinsed, to remove the adhering glycerine and gold. After this, a mixture of equal parts of metol and potash solutions is sponged over both front and back of the print. Washing for half an hour completes the operation.

Prints may be kept after development for some weeks or even months before toning, but very old prints will not readily tone. If the weather is cold, the water and dishes used will probably require to be slightly warmed or the action will be very slow. Prints are best toned in good daylight, as it is easier to see that the gold is kept evenly distributed over the print, and daylight also assists the action and renders the process more rapid than when performed by gaslight. The general effect of the toning action is to slightly increase the contrasts in the print, as proportionately more gold is deposited where there is a large quantity of platinum present than where there is a small quantity. The best results are obtained when the actual increase in intensity required is small only.

The method of treatment I have described will, I think, be found to have four distinct uses:—

1. To strengthen under-exposed prints.
2. To convert a rusty or brownish colour in a print into a pure black.
3. To produce blue-black in the place of black prints when this modification of colour is considered desirable.
4. To enable brighter prints to be obtained from flat negatives than is usually possible by the ordinary method.

The treatment can be applied to most silver printing processes; but, as a rule, the improvement is not very marked.

In conclusion, you are aware that other workers have published methods of modifying platinotype prints, and I trust the few examples I have brought are sufficient to indicate that we shall find, by further experiment, the means of producing still more variations in the tone and character of our platinum prints.

At a subsequent meeting of the Society, Mr. E. J. Wall made some remarks on silver intensification of platinum prints. He said that, at the last technical meeting, he had called attention to a process suggested by Dr. Vogel for the intensification of platinum prints by means of a solution of chloro-platinite of potash and ferrous oxalate. It was suggested that it would be easy to try that method, and he had accordingly done so, and so far he had been unable to get any satisfactory results. Some two or three days afterwards, he happened to be reading a German periodical, in which he came across a note which referred to experiments by Dr. R. E. Liesegang in the intensification of platinum prints by means of silver. The note in question appeared in *Photographisches Archiv*, p. 116, No. 716, 1893, and it stated that under-printed platinum prints could be intensified with aristogen, citric acid, and water, to which a few drops of nitrate of silver solution had been added. Aristogen was a special preparation placed on the market by Liesegang, and was composed of hydroquinone, acetate of soda, and citric acid. Mr. Wall had tried this process, and exhibited a few results to show that it was quite possible to intensify platinum prints by that means. He did not use aristogen, although he possessed the formula; he simply used an acid hydroquinone developer, as Liesegang stated that any acid hydroquinone or pyrogallic acid developer might be used. After the print had been cleared with hydrochloric acid, it was thoroughly washed, and then treated with the acid developer containing silver. When the silver was mixed with the acid developer, the solution turned thick and clotty, and quite white, he supposed by the separation of citrate of silver. After some time metallic silver would separate out, but, before that point was reached, the platinum prints were considerably intensified. After intensification, the prints required fixing in hyposulphite of soda, and then washing. It struck him that, having silver deposited on platinum, it would be possible to treat the silver image with various agents, and thus get other colours. The first print passed round had been treated with chloro-platinite of potash and ferrous oxalate, and he could detect no action, although there might be a very slight deposit all over; the solution went black instantly. The next prints shown were very much under-printed platinotypes, a portion of each being untouched, and another portion having been treated with silver and an acid pyrogallic developer. They had been forced to an enormous extent, and stained in consequence of the deposition of the silver. He had not worked out the process, and did not propose to give specific formula; he hoped that some one with more time than he had at his disposal would take up the subject and experiment further. There was not the slightest doubt that considerable intensification took place; but, if the action was very much forced, there was a deposit throughout on the paper, as was only to be expected. After trying the acid pyrogallic developer, he had tried hydroquinone, and in the result, which was passed round, he did not think there was any deposit on the whites. At the last moment, after the print had been mounted, it occurred to him that it would be possible to treat the silver image with gold uranium, &c., and he showed a print, a portion of which, after intensification with silver, had been toned with gold and sulphocyanide; there was a distinct change in colour, turning into blue. His attention had also been drawn on the previous day to the fact that Liesegang had been second in the field, and that Mr. Rowland Briant, in a paper read on the May 23, 1892, had given exactly the same process. The process seemed to Mr. Wall to be simple, and with hydroquinone he did not think there was any changing of the whites, and it was an advantage to be able to change the colour of a platinum print if one wished to do so. Having silver deposited on the image, it was very easy to treat the print with any of the known reagents, and thus get any colour desired to suit cretain subjects. With regard to the question of permanence, of course, in a platinotype, the image was absolutely permanent, so far as we knew, but he must leave it to better chemists than himself to decide as to the permanency of the silver deposit on the platinum. It seemed to him to have as fair a chance of being permanent as any ordinary developed silver print, or perhaps a better, as the greater part of the image would consist of platinum.

DEVELOPING CHLORIDE PRINTS.

As there seems to be an idea afloat that the method of developing chloride prints is not practicable, I should like to state that this is a mistake, as, with care, no process is easier or more certain, and to my son, who is printing for the trade in Manchester, it has proved of immense value during the last few weeks.

The extent of exposure to light (so long as it is sufficient—say, about one-eighth the full time) is of very little moment, as the prints can be all developed up evenly, and the result is, if anything, better than when fully printed out, the detail being better in light and in shadows in the developed print than when printed out; more especially with flat negatives is the advantage seen.

The process is simple enough. First the prints are placed, one at a time, in a ten per cent. solution of potassium bromide. Here they are kept moving for ten minutes. From this solution they are taken one at a time, and immersed in clear water, this being repeated for five or six changes of water. Running water is a mistake, taking too much time, and also risking the prints sticking together, and causing patches in development.

When properly washed they are ready for the developer, and it is at this stage that care is requisite. All detail must be brought out, but no attempt made to obtain vigour, or the finished prints will be too dark. The light used during this operation is ordinary gas or

oil, without any yellow screen, so that the operation of development can be watched easily. As each print is developed it is put in running water, as, unless the action be at once stopped, the print is spoilt. After development, wash carefully, and tone in a sulphocyanide bath, which occupies about the same time as with printed-out prints.

The new matt paper gives just as good results as does the glazed P.O.P., as also does albumenised paper sensitised at home, but the ready-sensitised is muddy in the shadows.

No special precautions are needed to shield the paper from light during the printing operations, not even in opening the frames for occasional inspection; in fact, the process is simplicity itself from beginning to end, and reduces the operation of making silver prints to a very easy one, and stamps the method as the greatest advance made since the introduction of albumenised paper.

To see a batch of prints come down, some dark, some light, and none right, and to see them when spread out to dry, is a great difference, as then they are all as near perfection as possible, and, even if any are too dark, a short immersion in a weak solution of cyanide of potassium will soon reduce them.

When the prints are toning, if any are too light, they can be washed and again immersed in the developer, then again washed and toned; but, if possible, this should be avoided, as there is risk of double toning, which is not always pleasant.

The cost of development is not much—say, 6*d.* for five sheets of paper, the bromide solution absorbing two-thirds of this; but against this must go the fact that at least twelve prints can be made in less time for development than if printed out, and this would weigh very heavy against that 6*d.* at this time of year—I say here twelve prints against one—and, at the beginning, say, one-eighth of the normal depth, which at first seems a misnomer; but in practice it will be found that, whilst chloride paper will print one-half its depth in, say, five minutes, it will take sometimes an hour or two to print the full depth, so that, in giving twelve to one, I have rather under than over-estimated the increased production of development over printing out.

W. T. Wilkinson.

PRACTICAL HINTS ON VARIOUS SUBJECTS.

Excellent trays for enlargements, and large work generally are made of pine wood. I find them extremely useful for many purposes, and have had them made from 16 × 13 to 30 × 24—the work should be done by a joiner, the trays being of full size and deep to hold easily the print or plate for which they are intended to be used. The sides should be well screwed to the bottom board (glass bottomed trays are an abomination), and when out of the workman's hands they should be finished at home; give them a good coating, inside and out, with shellac varnish (shellac dissolved in methylated spirits), stop all cracks, if any, with paraffin wax or the wax compound mentioned below; then finally give two coats, inside and out, with bath enamel, white inside and black outside, or any other colour desired.

They may be used for the usual purposes of photography, but after use should always be carefully sponged and wiped out with a wet leather. For convenience of storage and packing, let them be made in series to fit one within the other.

A serviceable dissolver for the lantern is easily made at home. It is simply a slide-carrier fitted with a flange to fit on the front of lens; a piece of ground glass of sufficient length, the two ends of which are sharply bevelled, slides backwards and forwards. If nicely made and worked, this will be found much pleasanter for one's audience than the sudden changes from light to darkness often inflicted upon a helpless congregation of fellow-men.

A negative wanted in a hurry, or a lantern slide made at short notice, may be dried very quickly, as follows:—After washing, wipe off as much wet as possible with a plug of cotton-wool, and dry the back of the plate; now immerse in a bath of methylated spirits of wine (which, it must not be forgotten, tends to reduce the density), then a final rinse with methylated ether ensures complete desiccation. After using the spirit several times, it will contain an appreciable amount of water. It is renovated by adding to a bulk of it some dry salts of tartar (subcarbonate of potash), shake up well, and let it stand; after a time pour off the supernatant spirit. An accumulation of the alkaline liquor is readily converted into oxalate of potash by the addition to it of oxalic acid in strong solution, till effervescence ceases.

Vignetting papers of various useful shapes and sizes are easily made. For a cabinet size, take a half-plate frame, and fit thereto a piece of plain glass. Gum on the centre of this, outside, a piece of cork, half to one inch in length. Pin on this a piece of shaped card, oval or otherwise. Put in the frame sensitised albumen paper, and expose to the extent of slight bronzing. The frame must be put, of course, where the light will fall *vertically* in order to get even results. Tone and fix the prints, and wash and dry them. They now require to be *waxed*. This may be done by placing, face up, on a hot plate, and applying white wax until it is uniformly absorbed, then put between folds of clean blotting-paper and apply a hot iron. The blotting-paper absorbs any excess of wax. These waxed papers and negatives often get bent and marked with much handling. This may be remedied by warming at the fire or ironing.

Border negatives don't seem to be very popular. Certainly those to be purchased leave much to be desired, for some of the designs are far from pleasing. A border negative is very useful sometimes, and helps to give a finish to a picture which otherwise would be incomplete. Some very pretty designs are often seen in the linings of books. I cannot particularise any book or books, but bookbinders have a capital collection of lining papers, many of which, carefully photographed, make good and suitable borders. Perhaps the best, however, certainly a favourite with me, is a border made by photographing a piece of "oatmeal cloth." This, neatly stretched over a flat board and copied in a good light, presents a very nice appearance, somewhat like that of rough drawing-paper, and seems to stand out well against the picture; the latter, being printed close up, appears as if mounted in a cut-out. It is an easy matter making a landscape border, but I do not advocate them. If the portrait is a poor one, one is apt to wish there were less portrait and more landscape. At the same time, judiciously selected, and to suit the time of year—Easter, Christmas, or the new year—we can oftentimes get really pleasing results. I have one, a sparkling winter scene, snow and ice, trees covered with rime, and over all a gentle sunshine. This is printed with a disc in the usual way; then, masking the border meanwhile, a cluster of merry, fur-lined faces is vignetted in, and makes up a very pretty picture.

One word here: if possible, don't *put off* taking the necessary *portraits* to the usual dark December days; or, if you do—and of course this is intended for the amateur—don't forget to give the requisite extra exposure.

Zinc trays coated with black varnish are often used; if not carefully cleansed and put away dry, and occasionally reblacked, they wear into holes very quickly. If not too extensive, these holes may be almost *permanently* stopped with a compound of wax and resin. I make this for professional purposes in the form of sticks. Melt half an ounce of resin and add one ounce of beeswax, mix, and pour out on to a cold slab, cut up quickly, and roll into sticks. A piece softened and pressed into a hole or crack makes a very tenacious filling. Apart from the above purpose, other uses will often be found for this cement. It is much more workable than paraffin wax, though, of course, the latter has its special uses.

No dark room is really complete without a drying cupboard. Many processes are a sealed book to the worker who is not possessed of a reliable "drying closet." Apart from the insignificance of its use merely as a receptacle for storing dry plates, to dry negatives in, or carbon tissue, excursions into such processes as collotype cannot be thought of without a place in which to dry the coated plates. I find a convenient arrangement is made in the following way, the dark room is supposed to be lighted from the outside. A gas jet burns outside the ruby window controlled by a tap within easy reach, therefore the room is free of deleterious gas fumes. Now, at a distance of twelve inches or so above the gas jet is adjusted a tin funnel *inverted*. The tube of the funnel is connected with a second metal pipe, which carries the hot air into the dark room, not to contaminate the air, but through an arrangement of pipes going round and round the inside of a large box; then, after three times round, out at the top of the closet and room. Air is supplied to the closet from outside, also carried out at the top. I find it easy to arrange for a steady flow of warm air. The *piping* is best made of metal, but cardboard cylinders (as supplied with sensitised paper) answer very well, are being taken to cut the joints accurately, and to carefully make them *air-tight*. The closet inside is fitted with iron rods placed across, and very accurately levelled. The door, after fitting as closely as possible, is made more secure by the insertion into a small and neatly cut rebate of a length of indiarubber tubing. This, running all round the edge of the box, makes a fairly air-tight joint when the door is closed and buttoned. To make the thing complete, a thermometer should be fixed up. Get a *chemical* thermometer about twelve inches long, and bore a large cork, into which it fits. A hole in the top of the closet to hold the cork is to be made next. The cork, with thermometer inserted, is pushed into its place, leaving so much of the apparatus outstanding as will indicate the temperatures attained.

To be constantly drawing upon one's purse when engaged in photographic pastimes takes a good deal of the pleasure away unless, indeed, something very good is seen for the outlay. I must confess I like to be able to do things for myself in preference to waiting the pleasure and convenience of others, hence the art of "soldering" I have found to be one easily acquired, very inexpensive, and on occasions exceedingly useful.

Business is undoubtedly far from good, but I don't advocate just now "tinkering" as a *profitable extra* for the professional. I *have* heard of a travelling tinker taking to photography and ultimately making his fortune thereby, but I hope the *reverse* won't happen to any of us. Seriously, a soldering iron is a very useful tool. Trays and cylinders, chimneys and funnels for ventilation, &c., are by no means troublesome to make. Many little contrivances that one makes in cardboard (such as, perhaps, an extending front for the camera for copying purposes) are better made in metal. Recently I have made an extra long front to my enlarging lantern to carry a second and (with adapters) third lens, as may be most suitable. To make a mount for a pair of condensers is easily done, while to fit up the lantern body itself is within reasonable bounds of possibility. The whole outfit need not exceed two shillings in cost—*i.e.*, a good soldering iron, which will be supplied ready "nosed" for use (the soldering bit is made of copper and pointed; this *point* is cleaned with a file and heated, a little soldering fluid applied, and then coated with solder, simply by rubbing against a stick of solder; if, by overheating, this coating comes off, it must be again cleaned and "nosed"), a small bottle of chloride of zinc solution, or *killed* spirits of salts (muriatic acid saturated with zinc filings) called the soldering fluid, some soft solder, and a supply of tin, which may be bought in sheets at a very cheap rate. The solder is conveniently kept cut up in small pieces. A gas stove is best for heating the iron, being cleanly, and the risk of over-heating being less. It is sufficiently hot when it will take up a piece of solder on its "nose" on being applied. The edges to be soldered must be perfectly clean and brushed over with the fluid prior to the application of the iron. Taking a cylinder, for example, say, the lantern front above mentioned, a piece of sheet tin is measured and cut off, bent round to the required size, allowing half an inch for "overlap." A shape or block may be extemporised, the tin bent round this and securely fixed in position, held by an assistant or tied with string, the edges brushed over with fluid, then a piece of solder is taken up on the nose of the bit, and applied to the edges, and drawn along, applying more solder as necessary to make the connexion. Some dexterity and practice are requisite to do neat work, but a file will help to smooth matters over. A disc is now wanted for one end; this must be neatly cut out, and a hole also made, into which to fit the lens. The disc should be just a trifle larger all round than the cylinder. Place the disc on a board, and one end of cylinder on top, so that we see a little of the disc all round. Apply the brush with soldering fluid to the edges as before; then, holding the cylinder steady, apply the solder as before, running it all round. We may now warm the cylinder, and give a coat of Japan black. If neatly done, we have a very workmanlike cylinder front. If the edges of the *aperture* are filled and smoothed with emery cloth, I find the lens may be screwed in without doing any injury to the screw, but a spare flange is to be preferred.

J. Pike.

PHOTOGRAPHY BY LAMPLIGHT.

Notwithstanding the success which has attended the application of the electric light for photographic purposes in the absence of good daylight, there would still appear to be a craving on the part of a good many workers for some equally good, but more simple, means of undertaking numerous branches of photography without the aid of a costly installation of electricity; and somewhat recently attention has been drawn to our trusty old friend gas—this time in the form of an incandescent light by means of a delicate shroud or mantle surrounding the gas flame, whereby the actinic power of the light is considerably enhanced.

The weak point, however, in these incandescent gas lamps appears to be the trouble in manipulating the fragile mantles or shrouds, besides the somewhat costly nature of the lamps with their incandescent attachments.

Again, these are only available in places where a suitable supply of gas is laid on, so as to feed the requisite number of burners.

On this account alone there are many country studios, likewise numerous enthusiastic amateur workers, who, not having a supply of gas in their premises, are of course outside the question of utilising even such a costly installation of gas lamps.

It is to such workers more especially that the following method of lighting is addressed; and I pen these remarks without in any way being desirous of detracting from the utility of these gas lamps for photographic purposes.

I know quite well from experience what can be done with gas, even for portraiture, for I have, along with the late Horatio Paterson, utilised such for the taking of portraits on a very large scale at fancy dress balls, &c., when as many as three hundred excellent negatives have been secured in one night, and as I write I can look with pleasure on many of the results obtained—results which will compare with daylight exposures. These results, however, were only obtained by a somewhat costly, although temporary, installation of gas into the anteroom where the ball was being held. The fittings comprised several hundred gas jets suitably arranged around the front, sides, and top of the portion of the room that was for the time being utilised as a sort of stage for the purposes of photography. The cost, however, was well laid out, for the results were most successful, both in a pecuniary and all other respects.

I often think nine-tenths of the failures which are made in all attempts at photography by means of artificial lighting are due to the employment of too small a supply of light, and the using of such an inferior quantity in too concentrated a form.

The main factor is a full flood of diffused light, and this is best got from many jets placed in proper positions without the introduction of diffusing screens. When gas is to be employed, the first essential is a plentiful supply from the main. It is no use trying to succeed without this, and but very few studios indeed are fitted with anything like a sufficient supply pipe to feed the requisite amount of gas jets to undertake portraiture. Any outlay in lamps or other fittings is just so much good money thrown away until a proper supply is laid on from the main. When such is available, and a suitable room or stage specially set apart, with white reflecting walls, and the entire light screened off from the camera, which must, as it were, work through an aperture, good and profitable results will be secured in portraiture.

Ventilation is another important factor, for without a certain degree of comfort it is useless to attempt portraiture. Such, however, is quite easily overcome, provided some forethought be brought to bear upon the subject and suitable entrances and exits made for the sitters in the extemporised gas studio.

In the instances I have referred to the sitters were introduced into the studio by a door at the back, and at no time were they posed at a nearer distance than fifteen feet to any gas jet. This arrangement was necessary, to allay any fear or dread of the flowing costumes coming in close contact with the lights.

When proper arrangements are made, sitters can be dealt with in a very rapid manner.

Suitable backgrounds must be employed, and these placed at a considerable distance behind the sitters, so as to prevent the cast shadows being seen in the pictures.

There are, however, very many workers, amateur and professional, who have not even the advantage of a gas supply, not to speak of electricity, and who have to give up all thoughts of night work; for as yet the flashlight has not been robbed of its smoke, and, until such be achieved, I am afraid in private houses and many studios it will never be largely employed, from this drawback alone. At least, I know that since my co-worker, Mr. Reid, and myself, who were the first to bring before the public notice the advantages of magnesium powder when blown through a gas flame, I have spent much time in endeavouring to bring to perfection some system of flashlight photography whereby the smoke nuisance would be overcome; but all without avail.

For several winters, therefore, I turned my attention to another method of lighting, so as to enable me to overcome very many orders that were not possible of execution by the poor daylight available in the dead of winter.

I therefore brought to my aid some good paraffin lamps, and experimented with them until, step by step, I worked out the problem; and now I can safely assert that, with a plentiful supply of good lamps, I can overcome almost any class of work at night-time.

In arriving at this result I have closely followed the experience gained by the success which attended the work done at the fancy dress balls referred to with the aid of gas, and which I have somewhat fully described here.

In my experiments I have used all kinds of lamps, from the modest one-wick country-house lamp (and this is not to be despised) to the more formidable hundred-candle power lamp of the mitrailleuse form, and the results have clearly shown me that large lamps used singly in a concentrated form are not nearly so serviceable as a battery of smaller-sized ones placed in suitable positions.

It is, however, not only in portraiture that these handy lamps come to be useful. This winter I had some very large missionary plans, charts, and drawings of about fifteen feet by ten to copy, and these I found were easily done with a few lamps. When such are used, it is wonderful what an even illumination can be obtained—an evenness of lighting not possible in many studios by means of daylight. With the plans tacked on to the side of a room, the lamps can be so placed as to throw an absolutely even flood of light. It takes a little experience in working by artificial light for the eye to judge when a white surface is evenly lighted. It may often appear to the worker, when first undertaking this, that the entire surface is so; but on development it will be at once seen where the illumination has fallen off. It is therefore a good plan, where large work is being done, to expose a modest quarter-plate first, which on development will show any inequality in lighting; and, where such is noticeable, the addition of an extra lamp, or quite possibly the alteration of the position of one already placed, will easily set matters to right.

Isochromatic plates and long exposures with the lens well stopped down are the chief factors in the success of copying even such large subjects as fifteen feet by ten.

My best results have been obtained with the use of four good paraffin lamps, of about forty-candle power each, with exposures ranging from ten minutes up to three-quarters of an hour. These negatives of plans and maps far surpass any daylight exposures I ever met with.

In portraiture working, with the lens well shaded from all front light, and using a good portrait combination, with open aperture, and a plentiful supply of lamps, I can obtain fully exposed negatives on fast isochromatic plates in six seconds.

The main factor is plenty of light. There must be no stinginess in this respect. A good one-wick country paraffin lamp can be had for one shilling and threepence, and twelve or fifteen of these, judiciously placed in front of the reflecting screen in advance of the sitter, with perhaps the addition of two or three extra strong lamps of the mitrailleuse form, of about forty to eighty-candle power placed on one side, will yield a fully exposed negative in an incredibly short space of time if a suitable developer is used.

I always use pyro and ammonia for this class of work.

T. N. Armstrong.

REVIEW OF THE THEORY AND USE OF COPPER SALTS IN PHOTOGRAPHY.

I.—Introductory.

The application of copper salts to photography has from the earliest days received a considerable share of attention, without, it must be confessed, obtaining many results of permanent value. So little is known, however, of the photo-chemistry of many of the salts of copper, that an interesting field lies open to the investigator in this branch of photographic research. Many obsolete processes, based upon the use of copper compounds, seem to contain the germs of promise of future utility, and it will be the object of the present article, not only to give an outline of what is already known in this direction, but also to point out, if possible, where our knowledge is deficient. The experimentalist has the advantage at least of being able to obtain easily and cheaply a large series of copper salts, which have not hitherto been much used for photographic purposes, amongst which may be mentioned many of the organic salts and the remarkable series of copper-ammonium compounds.

II.—Constitution and Reactions of Copper Salts.

It would be impossible in the limited space of a single article to give more than a very brief account of some of the more important reactions of those copper salts which have already been used in the photographic laboratory. Beginning with the haloid salts, we find two well-defined classes of compounds, the *cupric* and the *cuprous;* but some uncertainty seems still to exist as to the valency of copper in the latter class of salts. From the molecular weight of cuprous chloride it is thought that the proper formula for this substance is Cu_2Cl_2, the cupric chloride being $CuCl_2$. The haloid cuprous salts may be formed either by the action of the haloid acids upon excess of metallic copper, or by the action of metallic copper upon the corresponding cupric salts. The cupric salts are formed when copper is acted upon directly by an excess of the halogens themselves.

The cuprous salts are generally white or grey, and are insoluble in water, alcohol, or dilute nitric or sulphuric acids. They dissolve freely in solutions of metallic chlorides, ammonia, or sodium hyposulphite.

The cupric salts are usually coloured green or yellow, and are more stable than the cuprous compounds, with the exception of the iodide. Gehlen, however, showed in 1804 that an alcoholic solution of cupric chloride gradually loses its colour in sunlight, owing to photo-reduction to the cuprous salt. Haloid cupric salts also differ from the cuprous salts in being extremely deliquescent.

Cuprous chloride, dissolved in hydrochloric acid, forms an energetic reducing agent, converting mercuric chloride into calomel, decolourising Prussian blue, and reducing gold chloride to the metallic state. It is also a powerful absorbent of certain gases, such as carbon monoxide, acetylene, and hydrogen phosphide. Dissolved in ammonia and crystallised, it forms colourless crystals, becoming violet in the air, and reducing ammoniacal silver solutions. The action of alkali on cuprous chloride forms the hydrous suboxide, which dissolves in ammonia to form a powerful reducing agent, and a delicate test for oxygen, the colourless solution immediately becoming blue on exposure to the atmosphere. The suboxide is largely used for colouring ruby glass.

The action of light upon cuprous chloride was first described in 1859 by Dr. Vogel.* In the presence of moisture it becomes first yellow, then violet, and finally blue-black. The resulting product is believed to be an oxychloride, having the composition $CuCl_2$, $3CuO$, according to Vogel.† Plates of copper exposed to the action of chlorine, bromine, or iodine vapour, become coated with a grey or white film of cuprous salt, and are then sensitive to light, and will take photographic impressions. The sensitive cuprous chloride may be prepared by boiling cupric oxide and copper foil in strong hydrochloric acid, and pouring the clear solution into cold water. A white crystalline precipitate of cuprous chloride settles to the bottom. This becomes almost black after a few minutes' exposure to light. Polished copper plates may also be coated with a sensitive film of cuprous chloride by immersing them in a strong solution of neutral cupric chloride, obtained by boiling cupric oxide with hydrochloric acid.

It was found by Rosenfeld that the photo-reduction of cuprous chloride does not take place in presence of acetic acid, although sulphuric acid does not prevent the change.‡

The photo-reduction product of cuprous bromide is not so soluble in sodium chloride or hyposulphite as the unaltered salt. Cuprous bromide, also, is more sensitive to light than either the chloride or iodide.

Other copper salts, besides the haloid compounds, show a certain sensitiveness to light. The double oxalate of copper and soda blackens in sunlight, and in the presence of ferrous oxalate deposits metallic copper.§ Eder has shown that Fehling's solution (alkaline tartrate of copper and potash), even in dilute solutions, decomposes in sunlight, depositing copper oxide.

One of the best-known salts of copper, cupric sulphate, has a property which may be of possible use in photography. The crystals are intensely blue, but effloresce and become white on heating. The anhydrous white salt is very hygroscopic, and may be used as a test for the presence of water in organic liquids, such as alcohol, by the production of the blue colour of the hydrous salt. Cupric sulphate, even in solution, absorbs hydrochloric acid, and may be used to separate this substance from other gases, such as chlorine, cupric chlorine being formed and sulphuric acid liberated.

The hydrated copper oxide, $Cu(HO)_2$, has been found useful in a variety of ways, both in photography and other arts. It may be prepared by precipitating a solution of a copper salt with potash, and washing the precipitate rapidly. This hydrate dissolves in ammonia, and forms the solution commonly known as Schweitzer's reagent, although the discovery of the properties of this substance has been attributed to John Mercer.

This ammoniacal solution of copper hydrate has the property of dissolving cellulose. The viscous solution deposits gelatinous cellulose on the addition of acids, or more slowly by simply diluting with water. The deposit dries to a hard, horny mass. Paper or calico dipped in this solution and dried assumes a green varnish-like surface, consisting of cellulose and copper oxide, and becomes both antiseptic and impervious to water. In this way the well-known "Willesden" papers are prepared. Peligot's process for the preparation of Schweitzer's reagent is very simple. A glass vessel is filled with copper turnings and ammonia added, cautiously, on account of the heat which is generated. A blue liquid is formed, which rapidly converts cotton-wool into a thick jelly. Such a solution must be filtered through asbestos, as paper is quickly attacked. The cellulose can be reprecipitated by alcohol, acids, alkaline salts, honey, gum, or

* *Jahresb. d. Chem.*, 1859, p. 223.
† *Ding. Poly. Journ.*, p. 136, 238.
‡ *Chem. Centralb.*, 1879, p. 372.
§ Buchner, *Repert. Pharm.*, 49 p. 112.

dextrine. By evaporation of the solvent the cellulose can be procured in amorphous membranous sheets, which do not adhere to the support. Silk is dissolved as well as cotton, but gun-cotton, woody fibre, and pith seem to be unaffected. J. VINCENT ELSDEN.

(To be continued.)

ON THE PHOTOGRAPHY OF THE LUMINOUS RAYS OF THE SHORTEST WAVE-LENGTHS.*

The New Plate Sensitive to the Ultra-violet Rays.

A PLATE coated with pure silver bromide would in any case be most serviceable for photographing the rays of the smallest wave-length. For a long time I thought of using the Daguerreotype plate, which seemed for this purpose better adapted than the gelatine plate, as being free from retarding absorbents, if sensitised according to the process which Edmund Becquerel used for taking the solar spectrum. That I desisted from its use was due to its moderate sensitiveness and the manner of its formation.

Attempts to cover plates with an emulsion of silver bromide poor in gelatine proved entirely unsuccessful. The silver bromide deposited on the plate prior to the congelation of the coating, and there was formed above it a stratum of gelatine almost free from silver bromide, which prevented any result of the most refrangible rays; but, when I exposed to the spectrum pure silver bromide spread out upon a plate of mirror glass, I obtained a basis for the preparation of a plate such as I required for my experiments.

Pure silver bromide gave a very intense image of the spectral region beyond 185·2 $\mu\mu$ many times denser than any of the gelatine plates hitherto exposed. Here, then, was attained, for the first time—even if in a very imperfect degree—what had hitherto been wanting in all my proofs, the intensity required for a clear image of the lines. This proof, on pure silver bromide, imperfect as it might be, acquired in the sequel a fundamental importance for my work; it formed the initial point of a photo-chemical investigation—not yet complete—on the behaviour of the silver haloids of gelatine and its constituents soluble in water, of collodion, gum arabic, and agar-agar in ultra-violet light.

Among the principal results of this investigation ranks a new photographic plate of great sensitiveness for the ultra-violet rays and of corresponding intensity. With this, the above-named fluor-spar train, and with exclusion of air, I have subsequently obtained proofs of the extreme ultra-violet of faultless sharpness. From here date my better results with the more strongly deflected rays.

For two and a half years I have photographed all rays the wave-length of which is below 185 $\mu\mu$ exclusively with this plate, which is for the present the only means which allows of the observation of this region of the spectrum.

The new plate develops its maximum sensitiveness in the most refrangible ultra-violet. For instance, in the spectrum of aluminium it always shows first the line 32, and afterwards the other lines. Towards the red its sensitiveness decreases gradually, and from the cyanogen blue very rapidly, so that in the green it becomes coloured only on very energetic insolation. Hence, for the less refracted ultra-violet, and for the visible spectrum, it is less susceptible than for the remainder of the spectrum.

This smaller sensitiveness renders it all the more suitable for the photography of all the more strongly deflected violet rays. For as against the diffused light derived from the interior of the prism and of the lenses of the apparatus—which in gelatine plates is so apt to veil the background, and obscures all the more tender effects of the light—it is so little sensitive that it bears exposure for hours without danger of veiling. It presents, therefore, besides the desired sensitiveness, the advantage which was previously to be obtained only from a suitable filter for the rays.

The treatment of the new plate does not differ from that of the gelatine plate. The development is effected with pyrogallic acid and soda, and is generally completed in two minutes. The fixing bath is a solution of hyposulphite of soda in water (1 : 4). The fixation is very rapid, a few seconds being generally sufficient. The fixing agent can be washed out in a minute, and the drying does not last much longer.

The microscopic examination of the plate can always be undertaken in a few minutes after the development is completed. This is an advantage probably not possessed by any other plate in an equal extent.

The negative as to its intensity and its grain, depends on the preparation of the plate. It may have a very fine grain, but it is then never so intense as with a coarser grain, where it quickly attains absolute opacity. Indeed, plates which otherwise give a finely granular image can be brought to the utmost intensity, but not without a simultaneous increase of the size of the grain when the plate becomes less brilliant.

For microscopic measurements, for the comparator, the intense—*i.e.*, coarsely granular—image is far more suitable than the finely granular. This fact does not harmonise with previous observations made on other plates, according to which the finely granular image shows the better defined lines.

The image of the new plate can readily be magnified one hundred times without being rendered useless for measurements.

Distortions of the negative image, such as may readily occur with gelatine plates, are, in my opinion, here quite excluded.

The production of the new plate presents as yet difficulties. I have therefore turned my attention entirely to improving the method of preparation, which goes hand in hand with the development of the photography of the new rays.

The process which I now make use of I do not consider trustworthy for publication. I also wish to give at the same time a series of normal accessory facts in their regular connexion. To this end the verification of some of these results is necessary. Hence I prefer to treat the photochemical part of this investigation separately, and to defer publication until its definite conclusion. VICTOR SCHUMANN.

* Concluded from page 203.]

DEATH OF MR. JOHN POUNCY.

WE are sorry to have to record the death of Mr. John Pouncy, of Dorchester. Mr. Pouncy was at one period a somewhat prominent man in the world of photography, he having achieved that position in virtue of his introduction of a carbon process, which he subsequently developed into a method for producing photographs in oil pigments. Our volumes of thirty years ago, and over that period, contain much relating to Mr. Pouncy's early work. An appreciative notice of his career is given in the *Dorset County Chronicle*, from which we condense the following:—

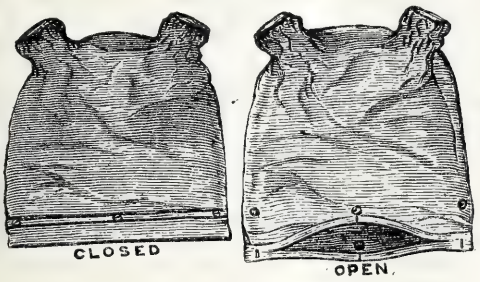
"Mr. Pouncy was first attracted to photography in the early days of the Daguerreotype process, and, working at it with intelligence, originality, and enthusiasm, he may fitly be described as one of the pioneers in the development of that art whose advances during the past half a century have been as interesting as they have been remarkable. In 1857 he conceived the idea of illustrating, by means of photography, the 'stately homes' of this county, and by his own skill and enterprise accomplished a part of that important work upon which the Dorset Field Club is now entering on a much larger scale—namely, a photographic survey of Dorset. The original idea was never carried out in its entirety, but four volumes were published, each containing views of country mansions, churches, and other features of interest reproduced from photographs by means of one of the forerunners of those many 'processes' by which in these days pictures are prepared for publication with such marvellous rapidity. The work was published under the title, *Dorsetshire Illustrated*. By J. Pouncy. The detail and touch of nature faithfully reproduced by a new process on stone by which views are rendered truthful, artistic, and durable." Mr. Pouncy having experienced the need of a means of producing photographs in a permanent form, his inventive genius led him to the discovery of a carbon process which, proving effective, became the basis upon which this branch of the art has been brought to such perfection, and which, looking to the advantages it has brought in its train, may fairly be regarded as of real national importance. For this invention he obtained, in 1859, the prize offered through the French Photographic Society by the Duc de Luyens for the best permanent photographic process. But the discovery of which Mr. Pouncy was most justly proud was a process for obtaining photographs in oil colours, and by means of which many of the *chefs-d'œuvre* of eminent artists have been copied with a faithfulness which would otherwise have been impossible. For this process also Mr. Pouncy was awarded medals by the Berlin, Edinburgh, and Paris Photographic Societies. In the various and more ordinary branches of the art, Mr. Pouncy was, of course, a successful worker, and, from his long study of the subject and his experience of its many intricacies, he was able, when he would, to impart much valuable information to those of the younger generation who had not had his advantages. For some time, however, he had been in failing health, and, although he could not be induced to remain indoors even during the recent cold and inclement weather, it has been apparent that his life had almost run its allotted course. A few days ago he contracted a cold, which was followed

by bronchitis, and, in his enfeebled condition, he was unable to rally, and early on Tuesday morning (March 27) he passed peacefully away, at the advanced age of seventy-five. In his private life deceased displayed a strong will and a firm determination, and, when once he had convinced himself he was right, it was difficult to move him; but, coupled with this characteristic, he exhibited a ready sympathy with real need, and, as far as his opportunities gave him the power, he left no stone unturned in order to help those who required assistance. As a proof of this, we may state that, during the cholera epidemic at Fordington some years ago, he, as overseer, regularly visited the infected houses, and his prompt action was frequently the means of saving life.

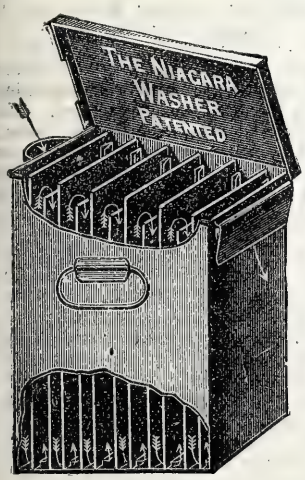
Our Editorial Table.

Wormald's "In and Out" Changing Bag.

Messrs. Wormald & Co., New Malden, Surrey, have introduced a changing bag which will prove useful for changing plates both indoors and out of doors. Its form will be seen from the cut. It is



provided with a large mouth at the bottom to enable dark slides, plates, and even hand cameras to be placed inside, after which the mouth is closed by buttons. The hands are then inserted in the sleeves, when the changing is effected with ease. It is nicely made in sateen, and is procurable through any dealer.



The Niagara Washer.

This useful plate-washer, which is manufactured by Mr. W. Tylar, of Birmingham, provides for the plates being stacked in, singly, between vertical partitions. The water flows into a cup at one end, as shown in the cut, and travels up and down, zigzag, finally emerging at the opposite end of the washer, after having flowed over every portion of the surface of every plate in the vessel. The washer holds twelve plates, any one of which can be removed without disturbing its neighbour. It is a useful appliance.

Trade Catalogues and Descriptive Circulars.

The Kodak (the Eastman Photographic Materials Company, Limited).—On opening this brochure of thirty pages, we are met at the threshold by the statement that the Kodak is used by their Royal Highnesses the Princess of Wales, the Duke of York, the Duchess of Fife, Princess Maud, the Crown Prince of Greece, by hundreds in the fashionable world, and by many members of the literary and scientific world, including photographic clubs. That Kodaks are now most extensively employed all over the world goes without saying. This pamphlet contains an abbreviated account of each instrument, and these are of very great variety, both in form, capabilities, and in price. Mr. Fred. Villiers, the *Graphic* War Correspondent, writes in terms of enthusiasm concerning the excellent service rendered to him by the Kodak.

W. Wray, Optician, Highgate, N.—It is with much satisfaction we find, from the new catalogue, that Mr. Wray has adopted the standard flange screws recommended by the Photographic Society of Great Britain. It wanted this alone to render his instruments beyond the shadow of reproach, the lenses themselves being always renowned for their excellence. The catalogue, contrasted with previous ones, is considerably enlarged. It embraces rapid and wide-angle rectilinear lenses; special lenses for hand cameras, which are made in a greater variety of focal lengths than formerly, and in a greater variety of mounts; landscape lenses of wide and narrow angles; casket lenses, ranging from five inches to twenty-one inches focus; stereo lenses, lantern projection lenses; with other items of interest.

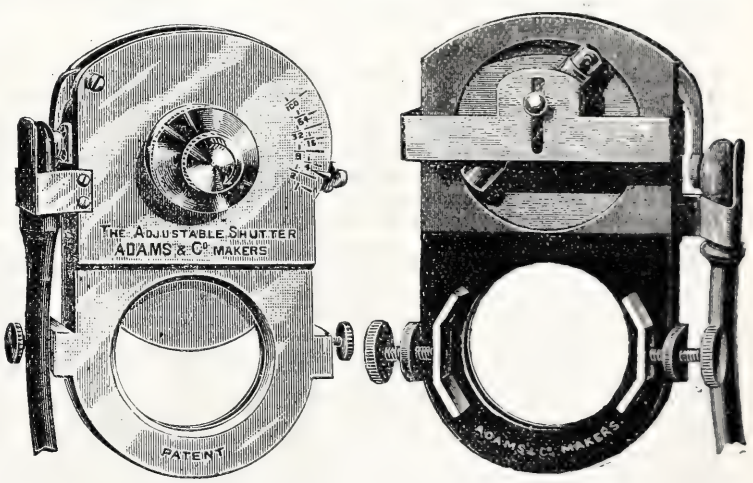
"Fallowfield's Photographic Remembrancer" contains as usual, a great variety of things of much utility. Opening with job lots, we find next a large collection of hand cameras under various designations, dry plates and films, printing papers and mounts in great profusion, lenses (among which we find the new Goerz double anastigmats of Berlin manufacture), ferrotype cameras, with batteries of lenses, chemicals, and, in short, everything which one can desire in practising photography.

A. Frank's Hand Cameras.—In this list we find hand cameras from half a guinea each and upwards. We are told not to consider the "Presto" as nothing but a toy, on account of the above low price charged for it. We should, however, have more faith in the performances of some other and higher-priced ones in Mr. Frank's list.

ADAMS & COS. PATENT ADJUSTABLE SHUTTER.

We question whether anything in the world has engendered such an outcome of mechanical ingenuity as photography for the short time it has been in existence. It almost astounds one, who devotes a little time to the consideration of hand cameras and shutters, to find what a vast amount of ingenuity of a high order has been expended upon these alone. With the publication of each one we are inclined to say that finality has at last been attained, but "still they come."

The appliance which prompts these remarks is a new shutter, patented, which is just introduced by Messrs. Adams & Co., 26, Charing Cross-road,



W.C., and 81, Aldersgate-street, E.C. Being made of aluminium, it is necessarily light, while the quantity of this light metal employed in its construction speaks for its strength and rigidity. The annexed cuts show respectively a front and a back view. The shutter is fixed to the lens by two jaws kept tight by thumbscrews. It is set by the turning of a button situated above the exposing aperture, and the rapidity of the exposure is regulated with great accuracy by an ingenious pneumatic appliance, so arranged as never to deviate from the rapidity determined upon.

The range of rapidity is from one hundredth of a second downwards, it being very easy to give a time exposure if desired. It most worthily bears the name "adjustable," for its movement can be adjusted to a hair s-breadth. It answers for either a hand camera or one supported on a stand, and is a fine piece of mechanism both in conception and execution.

In our announcement columns this week will be found a notice of considerable interest to purchasers of bag changing cameras and changing boxes. Messrs. Godfrey & Webb, the solicitors to Messrs. Newman & Adams, warn dealers and chemists against purchasing infringements of Newman & Adams' patent for improvements in changing boxes for photographic cameras.

News and Notes.

MR. S. HERBERT FRY has recently been ill with rheumatic fever, and has thus been unable to fill his lecturing engagements with several societies.

AT the Photographic Society of Great Britain's Ordinary Meeting, on Tuesday, April 10, *Polarisation Practically Applied to Photography* will be the subject of a paper by Mr. Birt Acres.

WE understand that under the auspices of the Committee of Societies affiliated to the Photographic Society of Great Britain, two lectures on *Theee Colour Printing* will be delivered at the end of this month in the Cordwainers' Hall, Cannon-street, E.C.

MR. W. COLE, of 4, Princes-street, Yeovil, writes: "It may interest you to hear that a Society has been formed here, to be called 'The Yeovil and District Camera Club,' with Mr. Stiby as President, Mr. Howell, Vice-President, and myself as Hon. Secretary."

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—Easter Monday.—A most enjoyable excursion to Winchester took place, when nineteen members attended. Permission to photograph in the cathedral and the deanery garden was kindly granted by the dean. The excursion secretary is to be complimented for the excellence of his arrangements for the benefit of those attending.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' INTERNATIONAL EXHIBITION.—We are informed that this Exhibition promises to be a very successful one. There will be from 120 to 130 exhibitors, and the Association hopes to beat the 1890 record. It opens on the 13th inst., and the opening ceremony will be followed by Mr. G. E. Thompson's lecture on *Life in Tripoli*.

AT the Central Photographic Club to-night (Friday) April 6, Mr. Thomas Fall is to deliver an address on *Photographic Experiences*, at the Club-rooms, Coleman's Hotel, 13, Henrietta-street, Covent Garden, at eight o'clock. On the following Friday, Mr. A. Horsley Hinton will deliver a lecture on *The Language of Photography*. Tickets can be obtained from the members or the Hon. Secretaries.

THE Royal Meteorological Society's Fourteenth Exhibition of Instruments, which will open on Tuesday next in the room of the Institution of Civil Engineers, 25, Great George-street, Westminster, will be devoted mostly to instruments, drawings, and photographs relating to the representation and measurement of clouds. The Exhibition promises to be a very interesting one, and will include original cloud sketches by the late Luke Howard, F.R.S., as well as photographs of clouds by the highest authorities in various parts of the world. The Exhibition will remain open till the 20th inst.

THE Birmingham Photographic Society's Exhibition of Photographs, in five open classes, and by the members, will be held in the Young Men's Christian Association Rooms, Needless-alley, on May 1, 2, 3, and 4, 1894, open at two p.m. on Tuesday, May 1, and continuing from ten a.m. until ten p.m. each following day. Nineteen silver medals, bronze medals, a silver cup, and other valuable prizes (besides certificates) are offered for competition, and in connexion with the Exhibition there will be an exhibition of apparatus, and lantern shows will be given each evening. The Secretaries are C. J. Fowler, Court-mount, Erdington; and T. W. Robinson, 63, Temple-row, Birmingham.

EXETER PHOTOGRAPHIC SOCIETY'S EXHIBITION.—This Exhibition was held last week, and proved in every way successful. In the open section there were over 300 frames, many of them examples of the best professional work, while a large number were contributed by amateurs. The section included pictures by foreign artists, and Scotland was well represented. In the "general" class there were nearly 240 pictures, twenty-six competitors appearing in the lantern-slide class, while there were thirty-four contributors in the "champion" class. Of exhibits not for competition there were six. There was a great improvement apparent in the members' section, both numerically and artistically. The five classes were as follows: General, eighty-four; portraits, twenty-three; architecture, sixteen; hand camera, thirty-one; lantern slides, fifteen. The following were the awards:—Members' section.—General: Silver medal, Rev. J. Sparshatt, *The Passing Cloud;* bronze medals, Rev. J. Sparshatt, *A Favourite Haunt;* and Miss K. Truscott, *Entrance to Fisherman's Cottage, Clovelly.* Portraiture: Bronze medal, Rev. J. Sparshatt, *In Wonderland.* Architecture: Bronze medal, A. H. Denmead, *Wells Cathedral.* Hand-camera work: Silver medal, C. Cole, *A Nor'-Wester;* bronze medal, C. Cole, *I've Got It.* Lantern slides: Silver medal, views set, C. Cole; bronze medal, plaque, Colonel A. Dawdhall. Special medal for the best picture in members' classes: J. W. Huggins, *The Exe at Brampford Speke.* Open section.—General: Silver medals, J. W. Higgins, *A Water Frolic;* Robert Terris, *The Ghost Story;* S. B. Donkin, *Ploughing in Spring;* Charles Moss, *A Winter Sunset:* bronze medals, T. H. Morton, *Crypt;* T. Lee Sims, *Hearts are Trumps;* Hy. O. Isaac, eight landscape studies; Ellen Underwood, *A Freshening Breeze and a Cloudy Sky;* W. M. Warneuke, *At the Well;* Edwin Underwood, *Oriel College, Oxford;* F. Howard, set of six; E. B. Rock, *Grief, a study by ordinary gaslight;* H. O. Isaac, *Caught Napping.* Champion class: W. M. Warneuke, *In the Meadow.* Lantern slides: Silver medal, J. F. Blower, views; bronze medals, George Hanks, various; E. R. Ashton, *Tunis and Keronay.*

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—On March 29 there was a meeting at the rooms of the Photographic Society of Great Britain, Mr. R. Beckett in the chair. *First application.*—Was from a family in which the father is incapacitated through old age and blindness, and which was assisted last year, which had now fallen slightly into arrears through non-payment of rent by a lodger. A grant of 2*l.* to pay arrears of rates was voted. *Second application.*—An old man, who had been twenty-five years in photography, and sixteen years in his last situation, as a printer, had received 25*s.* a week for many years, which was reduced to 20*s.* some time ago, and afterwards the employers attempted to reduce it to 15*s.*, when he left. This was nine months ago, since which time he has been out of work, but came to London to seek it, but has not been successful. Temporary assistance was granted for a few weeks. *Third application.*—From a woman photographer, who was assisted last spring, and now asked for further assistance, as both she and her husband were out of work. In this case a small grant weekly for a few weeks was granted. *Fourth application.*—From a country photographer, who was recently assisted, and who now asked for a further loan of 5*l.* to complete purchase of a larger camera. This was granted. *Fifth application.*—An assistant, who had been long out of work, and had recently started in business in a small way for himself, but being unable to make a living, asked for 2*l.* to pay his arrears of rent and debts. Granted. *Sixth application.*—An assistant, who asked for loan to clear a few small debts of long standing, contracted through illness in his family. Secretary was instructed to ask for further references. *Seventh application.*—From a country photographer, who asked for a loan of 10*s.* to enable him to leave the town in which he had been attempting to get work. Granted. Two other applicants, who had been receiving a small sum weekly for some time, applied for extension of the time. The Secretary was instructed in each case to make one further payment only. Mr. C. Finch was accepted as a subscriber. The Secretary stated that Mr. George F. Fall, of 6 and 7 Portman-street, Portman-square, W., had accepted position of Hon. Solicitor to the Association, and was instructed to offer the Committee's best thanks to that gentleman, and to at once place in his hands one or two cases of non-payment of loans.

EXHIBITION AT BEVERLEY.—The Beverley Photographic and Sketching Society are to be congratulated on the unqualified success which attended their latest efforts, in the shape of a public exhibition, the first yet promoted by them, in the Assembly-rooms, on Easter Monday. The opening ceremony, which took place at noon, was kindly undertaken by Dr. Crooke, in the enforced absence of the Mayor (Mr. Tom Turner), who, in speaking of the rapid growth and progress of the Society from its foundation twelve months ago, passed high encomiums on the energies of its members, and of the opportunities and scope for future effort. A large company was present during the day, especially in the evening, when the Exhibition rooms were crowded. The number of entries was particularly good, there being competitors from all parts of the Kingdom. Arranged on tiers of stands, the pictures were seen to great advantage, and the further decorations of plants and muslin, &c., assisted to give a very striking effect. The competitive specimens were arranged on tiers round the small rooms and one of the side rooms, and, with the aid of plants and other decorations, the *ensemble* was very marked. The Judges were Mr. and Mrs. S. F. Clarke, Louth, for the photographs, and Messrs. T. E. Burras and T. Burton for the paintings, the following being the awards:—Open Classes.—Landscape, Seascape, and Architecture: Silver medal, J. H. Gear (London), *Going to Sea;* bronze medal, C. A. Timmins (Runcorn), three landscapes; extra bronze medal, S. L. Coulthurst (Manchester), six landscapes; highly commended, R. J. Latham (Howden) Library, *Carlton Towers;* commended, A. E. Hobson (Beverley), *Beverley Views.* Portrait and Figure Studies: Silver medal, J. H. Gear (London), *The Return;* bronze medal, withheld; highly commended, W. D. Welford (London), *For some must lose;* commended, W. B. Dart (Bridgewater), *Somebody's Darling.* Hand-camera Work (six direct prints on one mount): Silver medal, W. Thomas (London); bronze medal, W. D. Welford (London); highly commended, W. B. Dart (Bridgewater); commended, A. E. Hobson (Beverley). Enlargements: Silver medal, J. H. Gear (London), *Handel's Organ;* bronze medal, S. L. Coulthurst (Manchester), *A Corner of the Market;* commended, James Shaw (Manchester), *Moreton Old Hall.* Lantern slides (sets of six): Silver medal, F. Howard (Wallingford); bronze medal, James Shaw (Manchester) and G. Hankins (London), equal; highly commended, S. L. Coulthurst (Manchester) and E. R. Ashton (Tunbridge Wells). Photo-microscopic class: Silver medal, W. I. Chadwick (Manchester; bronze medal, withheld; highly commended, C. D. Holmes (Hull) and E. Dockree (London); commended, S. Brown (Manchester). Members' classes.—Landscape, Seascape, and Architecture: Silver medal, R. Railston Brown, *Norman Door, Tilbury Church;* bronze medal, W. Barnard, jun., *Mere, Bishop Burton;* highly commended, W. H. Kirby, *Gateway, Burton Agnes Hall;* commended, J. V. Kinsley, *Harbour Entrance, Bridlington Quay.* Portrait and Figure Studies: Silver medal, withheld; bronze medal, W. Barnard, jun., *A Cup of Camomile Tea;* highly commended, Mrs. W. Thompson, *Girl's Head.* Club Excursion Work: Silver medal, W. Barnard, jun., *Percy Shrine, Beverley Minster;* bronze medal, Mrs. W. Thompson, *Hedon Church;* highly commended, Rev. F. J. Hall, *Interior, Dining-room, Burton Agnes Hall.* Enlargements: Silver medal, Rev. F. J. Hall, *A Lady;* bronze medal, H. Mann, *North Bar Gateway;* highly commended, G. Dawson, *Grovehill.* Lantern slides (set of six): Silver medal, withheld; bronze medal, Rev. F. J. Hall.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6185.—"Improvements in Tripods or Supports for Cameras and other Objects." Complete specification. E. W. PERRY, JUN.—*Dated March*, 1894.

No. 6256.—"Improvements in Photography called 'Photo-sculpture.'" J. R. HUETOS.—*Dated March*, 1894.

No. 6348.—"An Improved Envelope, specially applicable for the Transmission of Photographs and the like." G. F. CHENEVIX-TRENCH.—*Dated March*, 1894.

PATENTS COMPLETED.

An Improved Method of Photographic Printing in Bromide of Silver.

No. 6491. Ephraim Norman, 52, Jerningham-road, St. Catharine's Park, Hatcham, S.E.—*January* 27, 1894.

My invention relates to the preparation of a printing-out bromide of silver for photographic purposes, that is to say, of bromide of silver which will yield a completely printed visible image in the printing frame by the action of light without after development. I first take from 55 to 110 parts by weight of gelatine, and melt it in 1000 parts by weight of water. I then add, in proportions stated hereafter, a soluble bromide, such as the bromide of ammonium, or barium, or cadmium, or calcium, or lithium, or sodium, or potassium, or zinc, or any other that will not reduce nitrate of silver to the metallic state. For every 1000 parts by weight of water I may take from 25 to 50 parts by weight of bromide of ammonium, or from 37·5 to 75 parts by weight of bromide of barium, or from 45 to 90 parts by weight of bromide of cadmium, or from 35 to 70 parts by weight of bromide of calcium, or from 25 to 50 parts by weight of bromide of lithium, or from 25 to 50 parts by weight of bromide of sodium, or from 27·5 to 55 parts by weight of bromide of potassium, or from 27·5 to 55 parts by weight of bromide of zinc.

I may take one bromide only, or I may mix any two or more in proportionate parts. I may also add from 8 to 12 parts by weight of a soluble chloride, such as chloride of sodium or ammonium, and I may further add from ·5 to 1 part by weight of an acid, such as hydrochloric acid. I then mix the bromide or bromides to the hereinbefore mentioned gelatine solution, together with the chloride and hydrochloric acid, and with the mixed solution I coat paper, or other suitable material, either by means of a brush or other suitable appliance, and allow it to dry. I then float the material, prepared side down, on a solution of nitrate of silver, containing from 114 to 137 parts by weight of nitrate of silver to 1000 parts by weight of water, and again allow it to dry. I again float the material, prepared side down, on a solution of oxalate of potassium, containing from 180 to 200 parts by weight of oxalate of potassium to 1000 parts by weight of water, and again allow it to dry. The material prepared in the above mentioned manner is then ready for printing, after which it may be toned and fixed in the usual way.

The claim is: The preparation of bromide of silver on paper or other material in such manner as to yield a completely printed visible image in the printing frame by the action of light, substantially in the manner hereinbefore described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
9	Camera Club	
9	Lantern Society	
9	Norfolk and Norwich	
9	North Middlesex	*Failures.* E. J. Wall.
9	Putney	
9	Richmond	
10	Birmingham Photo. Society	
10	Great Britain (Technical)	*Polarisation Practically Applied to Photography.* Birt Acres.
10	Hackney	*Negative Making on Cut Films.* W. H. Barnes.
10	Manchester Amateur	
10	Newcastle-on-Tyne & N. Counties	
10	Paisley	
10	Rochester	
10	Stockton	
10	West London	*Negative Development.* A. Pringle.
11	Croydon Camera Club	Annual Dinner at Greyhound Hotel.
11	Ipswich and Suffolk	
11	Leytonstone	
11	Munster	
11	Photographic Club	Members' Open Night.
11	Southport	
11	Stockport	
12	Birkenhead Photo. Asso.	
12	Camera Club	
12	Cheltenham	
12	Ealing	
12	Glossop Dale	
12	Hull	
12	Leicester and Leicestershire	
12	London and Provincial	
12	Manchester Photo. Society	
12	Oldham	
13	Bristol and West of England	
13	Cardiff	
13	Central Photographic Club	*The Language of Photography.* A. Horsley Hinton.
13	Croydon Microscopical	
13	Halifax Camera Club	
13	Holborn	
13	Ireland	
13	Maidstone	
14	Croydon Camera Club	Excursion to Carshalton. Train from West Croydon, 2.48.
14	Hull	
14	Liverpool Amateur	Bidston. Leader, T. F. Lloyd.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 29,—Mr. J. S. Teape in the chair.

Mr. P. Everitt exhibited the "Constant" time and instantaneous shutter, which, he remarked, was handy for hand cameras.

Mr. Thomas Bedding asked for experiences as to the use of the new (mineralised) methylated spirit for drying off negatives. The previous day he had been using it for this purpose, and found that it left ridges and black markings on the negative.

Mr. Everitt stated that he had recently been using a cold negative varnish, which, upon the application of slight heat, produced pinholes.

The Chairman asked if any one had tried the experiment suggested by Mr. W. B. Bolton in The British Journal of Photography for the removal of the mineral naphtha by means of permanganate of potash?

Mr. E. H. Bayston stated that he had recently immersed matt Ilford paper prints, mounted on Bristol boards, in hypo for several hours, at the end of which time he found that the image was nearly gone.

PHOTOGRAPHIC CLUB.

March 28,—Mr. J. Weir Brown in the chair.

The Hon. Secretary read a letter from Mr. W. England, regretting his inability to give a demonstration of the Daguerreotype process at the previous meeting on account of domestic trouble.

Mr. T. Charters White showed results taken on the Easter Monday outing to Stanford-le-Hope.

Mr. F. Haes stated that Zeiss had issued a new series of lenses to compete with the Goerz lenses. According to the catalogue, they could not be bought in this country on account of the English Patent Laws operating against their sale by an agent.

Mr. R. Child Bayley asked why, if Zeiss alleged that there was no advantage in the new Goerz lenses, the firm of Zeiss were making lenses to do the same kind of work.

Mr. Haes replied, that it was simply to meet the competition. He had always maintained that, except at the extreme edges of the field of the lens, the Goerz lens had no advantage over the old Zeiss form.

Being a Lantern Night, slides were shown by the Chairman, Messrs. T. Charters White, Broad, Captain Hayes, Sinclair, Medland, and others.

Central Photographic Club.—March 30, Mr. T. Sebastian Davis in the chair.—Mr. Redmond Barrett exhibited an electric lamp of his own invention, and for the purpose of retouching it gave a good soft, steady light for twenty hours. The front was so arranged that, by changing the front glasses, it could be used for developing, the light being capable of being thrown either in an upward or downward direction at will. By substituting a small bull's-eye for the front glasses, the lamp could be used for reading. The lamp was of five-candle power, and could be recharged for ninepence. Mr. Barrett hoped to be able shortly to replace the present battery by one of the dry form, which would obviate the necessity of carrying the lamp in an upright direction. After illustrating the method of using the lamp, Mr. Redmond Barrett proceeded to read a paper on *Retouching and the Trade.* He said the question to be solved was, Whether anything could be done to better the present state of the trade, and better its future prospects? The mistake most retouchers made in their work was to destroy all individuality in the portrait. Foreheads, as a rule, require very little retouching, but yet he had seen all the marks and lines taken out. No photograph can do without retouching, but the less done to the negative the better, the more lead put on the more likelihood there was of losing the likeness. In the early days all the work was done with colour, but at the present time the lead pencil is chiefly used. Formerly there was a very good living to be got, but now it is very different. Prices have gone down, and naturally, when higher remuneration is given, the retoucher gives more care and study to his work. Country photographers are more speculative in the matter of retouching than London ones are. At the present moment we have not twenty good retouchers in London. There are scores who can polish a negative in a most beautiful manner, but they destroy all likeness. Many operators complain, and with good reason, of the loss of all the delicate effects of their lighting in retouching, which causes them to be less careful. The beautiful-looking photographs went down with the public until they began to inquire whether they resembled the original, which in many instances they did not, and he remembered one good-looking lady who told him that among all her photographs there was not one which was a good likeness. Many of the Continental houses are as bad as our own in retouching. If likeness is of any consequence, it ought to be preserved, the smoothing up of every surface is not the beginning and end of the art. Another thing which militated against photography is the wholesale production of prints, &c., by large concerns—in fact, work cannot be carried out conscientiously and properly in large firms. The difference in the charges for the same work was also a great drawback. Personally he had not found a rush for cheapness. Prices ought to be kept up instead of being lowered. In judiciously catering for a smaller crowd we get a living for ourselves, and leave room for others—the world is big enough for all. "If I get a customer in a country town, and paint in his backgrounds, I don't approach another man in the same place, because, in all probability, if there is no competition, the customer is likely to push anything which seems likely to take on." In large towns, where the proprietor is a photographer, he fixes his own standard of the quality of work to be sent out, and in other cases the operators fix it. Men who show individuality in their work are always certain of making a living. In large joint-stock concerns there must always be a very large turn-over before there is any dividend or profit for the shareholders. The paper used at the present time is at the root of the evil—fading. We don't get the same quality as formerly. The question of prices is one in the hands of photographers generally, amateur and the customers, and if a fair standard medium price was fixed, photography would be all the better for it. The Chairman said thirty or forty years ago

there was a large feeling of association for mutual support, the benefit of which had been destroyed by cutting prices. With the public, price was a secondary consideration if a good likeness was obtained. Mr. THOMAS FALL gave his experiences with reference to retouchers and their work, and particularly deprecated the "egg-shell complexion" turned out by some houses. With regard to fading albumenised paper, in the early days it was very different from what is sold now. It was made from pure white of eggs, thinly coated, and caused very little discolouration of the sensitising back; but what we get at the present time is offensive in smell, thickly coated with some substance which is not pure albumen at all, requires a larger quantity of silver, and very quickly discolours the bath. In consequence of the unstableness of albumen paper, he had discontinued its use for two or three years. Mounts were responsible for some of the fading, and he thought photographers should require manufacturers to give a guarantee as to the quality of the goods supplied. In replying, Mr. REDMOND BARRETT said he was sorry he was unable to show the slides he had intended, as they had not come to hand n time, notwithstanding they were promised.

Ealing Photographic Society.—March 22, Mr. H. W. Peal in the chair.—Miss Baker, of Barnes, was elected a member. The PRESIDENT addressed the meeting *re* the question-box, which he hoped would be made more use of, and then referred to the exhibition which was to have been held on April 19, but which the Council have decided to postpone till the early part of next season. Thursday evening was considered by a small majority to be the most convenient evening for the meeting. The rules with the proposed alterations were then read, discussed, and voted upon. The principal alteration is that the Society will next season meet at 8.15 p.m. every Thursday instead of at 8 p.m. every other Thursday.

Bath Photographic Society.—March 28, Mr. Augustus F. Perren (President) in the chair.—Messrs. Dowding and Thomas were elected members. The CHAIRMAN, in suitable terms, referred to the decease of Mr. W. B. Beauchamp, of Norton Hall, who had been a friend to the Society. The family acknowledged the sympathy which had been expressed by the Society in their bereavement. Some formal business having been disposed of, the Chairman gave an entertaining description of a trip to Scotland. The places visited comprised most of those on the west coast known to tourists, besides many others situated away from the beaten track. The lecture was copiously illustrated with lantern views, the work chiefly of the lecturer and Mr. George F. Powell, the latter gentleman also officiating at the lantern. The first annual dinner was announced to take place at Fortt's on Tuesday next, the 10th inst., at half-past seven. Tickets from the Hon. Secretary, W. Middleton, or the Dinner Committee, Messrs. Powell and Lambert.

Ipswich and Suffolk Photographic Society.—This Society gave a Lantern Night on Friday last to a good attendance. About two hundred slides were shown, contributed by Messrs. Allen, Bond, Curtis, Penraven, Sneezum, Wiggin, and Mrs. Catherine Ward. The Society has now been affiliated to the Photographic Society of Great Britain.

Liverpool Amateur Photographic Association.—March 29, the President (Mr. A. Tyrer) occupying the chair.—Six new members were elected. Mr. G. F. WYNNE, of Wrexham, patentee of the "Infallible" exposure meter, gave a lecture and practical demonstration, entited *Correct Exposure and how to Ensure it.* He developed a few plates that had been exposed by himself and two members of the Society during the afternoon by his new meter, the results being very satisfactory.

THE first excursion of this year was held on Saturday, March 3, when the Society journeyed to Rossett and Gresford under the leadership of Mr. H. Holt. There was a large muster of members and their friends, and the outing was graced by the presence of several ladies. Special compartments were reserved by the Great Western Railway Company, and the excellent arrangements made by them were greatly appreciated. A substantial tea was provided at the Griffin Inn, Gresford. The weather, however, was not all that could be desired from a photographic point of view, being extremely dull and persistently remaining so; but, in spite of this, over two hundred plates were exposed and many artistic bits taken. Several groups were taken by the President (Mr. A. Tyrer) and Dr. John W. Ellis. The trip was thoroughly enjoyed.

Glasgow Photographic Association.—March 29.—The members held their first Salon Night in one of the rooms of the Philosophical Society in Bath-street, and on their invitation a large number of ladies and gentlemen unconnected with the Society attended. The guests were received by Mr. Stuart (President). This is the first Exhibition held under the auspices of the Association, whose membership is made up of professionals and amateurs. The collection, while not a large one, was of first-rate quality. Mr. Stuart (the President) showed some interiors, and Messrs. J. & T. Annan were represented by reproductions of Raeburn portraits, &c. A specially interesting set illustrated isochromatic photography. The examples forwarded by amateurs were more than creditable. Indeed, Mr. Stuart, in a short address, admitted that the amateurs are doing so well that professional photographers must look to their laurels. The Exhibition, he added, was not as large as he hoped might be brought together in future years. In the course of the evening, photographs were projected on a screen by means of the lantern. This was, perhaps, the most enjoyable item in the night's programme. The pictures were exceedingly beautiful. They were pictures of land, and cloudland, and sea under many conditions of light—in full sunshine, in tender evening tones, in all the seasons. White-winged yachts skimmed through lively waters, the breeze heeling them over until the keels were almost laid bare. Hayfields and their picturesque activities formed the subjects of a good many of the photographs, and one showing a couple of bulls butting was said to have been taken from life. There was evidence of this in the picture, for the massive creatures kicked up the earth under their feet into cloudy dust, which must have been instantaneously taken; but where, it may be asked, had the enterprising photographer meanwhile ensconced himself, lest the great brutes should take it into their powerful heads to butt him and not each other? Another interesting picture was that of a building in Montreal which had been destroyed by fire in winter. The brigade seemed to have played on the tall ruins after the fire had been subdued, and the cold was so intense that the water immediately turned into masses of hanging ice. The entertainment was altogether a delightful one.

FORTHCOMING EXHIBITIONS.

1894.	
April 6, 7	*Aston Natural History and Photographic Society. Hon, Secretary, F. W. Pilditch, 133, Wills-street, Aston.
,, 13-28	*Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 16-28	*New York. T. J. Burton, 111-115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

RETOUCHING.

To the EDITOR.

SIR,—With reference to your article in your last, "Will Photographic Business Revive?" and especially to that paragraph of it which treats of incompetent retouching, I should like to offer a suggestion; and that is, why should not some of the leading photographers constitute themselves into a board of examiners, to hold examinations in, and grant certificates for, all that branch of work in which skill with a brush or pencil is required, *viz.*, "retouching" and "finishing?" Such a board might sit in London once a year, and the examination might be somewhat on the following lines:—First, the retouching of a cabinet head in forty minutes, as a test of speed and quality of work combined; second, the retouching of a similar head in a couple of hours, as a test of excellence of work alone; third, the retouching of a very large, say, a six or seven-inch head, as a further test. As to the certificates, these should, I think, comprise a first and second class. The first-class certificate would be given only to those who had excelled in every test; the second class to those retouchers who, though good in all, were not up to the standard of the very best work in each, and a similar examination might be held for brush work.

Perhaps some may object that this might raise the rate of retouchers' wages; but a little thought will show that this could not hold for long, because, by the inevitable sequence of supply and demand, there would soon be as many certificated men (or women) in the market as there are now non-certificated, and therefore wages would be at the same level, while excellence in that branch of photographic work would have a tendency to increase.—I am, yours, &c., A RETOUCHER.

Weston-super-Mare.

MEASURING THE ANGLE INCLUDED ON A PLATE.

To the EDITOR.

SIR,—May I be permitted to warn your readers against a mistake which they may make in applying the rules given last week in the article concerning the angle included by a lens?

In the fifth paragraph you recommend the use of the longitudinal dimension of the plate upon which to erect the triangle including the required angle. Having made the measurement and selected a lens including the angle and no more, it will be found that the corners of the plate are not covered. The direction should be:—Base the measurement upon the diagonal of the plate, if the question in the second paragraph of your article is to be answered, viz., "How can I ascertain what angle of view will be included on, say, a whole-plate or any other size, by the use of such lenses as I possess?"

As to defining a wide angle, anything over sixty degrees might conveniently be so described. This is the limit usually imposed by writers on perspective. To avoid apparent exaggeration, they recommend that this angle should not be exceeded, and it is this objectionable feature which is generally associated with the use of wide-angle lenses. If the focus is as long as the diagonal of the plate, an angle of sixty degrees will not be exceeded.—I am, yours, &c., P. EVERITT.

London, April 2, 1894.

PHOTOGRAPHERS AS DEALERS.

To the EDITOR.

SIR,—Having read with considerable interest the reply by "Cosmos" to "Thirty Years' Professional," I should certainly advise any photographer desiring to take up the supply of amateurs, &c., with photographic goods, to put such ideas for ever on one side. I had a dip at it

some years ago, and certainly say, "My last state was worse than the first." I could give you pages of most miserable experiences if it was necessary. The amateur I have a great respect for, but we must not touch on a business relation again. What with loss of capital, time, and temper, I shudder at the shadow of the past.

I certainly don't always agree with what "Cosmos" writes upon different subjects, but we certainly are as one on this point.

And, as touching the combination of professionals, I for one do not think photographers ever did or ever will combine, and, what is more, don't desire it. Why, sir, in my own experience of about twelve years, I don't think our combination, out of about seven photographers, consists of more than twelve words exchanged in the whole business experience. The utmost jealousy exists, and, in making this remark to a friend the other day, he said I should take it as a compliment.

If I am not taking up too much of your valuable space, I should like to make a remark or two on the subject of "Trade Depression," for the reason, in a great measure to my mind, you have only to turn to a few back numbers of the JOURNAL to the remarks of one correspondent, who makes the statement that, for six years (I think this is the period mentioned), he has not had so much as a single inquirer, let alone an order for an enlargement. How any man could sit down or be satisfied with the production of *cartes-de-visite* or cabinets for this number of years is surprising!

It is not new processes, fresh styles, mounts that are wanted, but the tact and business ability to put what is at present upon the market to a successful issue. You may have elaborate show-cases, artistic specimens, &c., but these in themselves will not combine to produce a satisfactory result; until we lose sight of so much professional starch, and look to the business side of things, there will be no improvement. I look, personally, on my profession as a means of earning my "bread and butter." I do not look upon the profession generally (as I heard a remark some years ago) as being in a state of chronic bankruptcy; there is plenty of money to be made yet, and I, for one, mean to have a share, and, if any experience I have found of a successful nature would be welcomed by any photographers I should only be too pleased to state them by letter or through the JOURNAL.—I am, yours, &c., SILVERDALE.

April 3, 1894.

To the EDITOR.

SIR,—As "Cosmos" fails to carry on this controversy in gentlemanly language, I must decline to reply to his letter. The taste of writing and publishing such vulgar abuse I leave to the judgment of your readers.—I am, yours, &c., THIRTY YEARS' PROFESSIONAL.

April 2, 1894.

PATENT LAW IN DENMARK.

To the EDITOR.

SIR,—It will no doubt interest a number of your readers to be informed that on 28 ult. a new Patent Law for Denmark passed both Chambers of the Legislature, and it is expected will be signed by the king in the course of a few days.

The principal features are the same as the laws of Germany, Norway, and Sweden, viz:—

Protection from date of filing application; duration of patent fifteen years; importation of patented articles prohibited; examination as to novelty prior to the grant; opposition to grant by interested party permitted.

The new law is to come into operation about the middle of June, and we think it would be well for any one contemplating patenting an invention in Denmark to wait until then before having an application for letters patent filed, and thus obtain the advantages of the new law.—I am, yours, &c., W. P. THOMPSON & Co.

6, *Bank-Street, Manchester, April* 2, 1894.

THE WORK OF THE AFFILIATION COMMITTEE.

To the EDITOR.

SIR,—I am a little surprised at the tone adopted in your leaderette in the issue of THE BRITISH JOURNAL OF PHOTOGRAPHY for Friday last with reference to some remarks of mine at a recent meeting of the Woolwich Photographic Society respecting the report of the Affiliation Committee.

My speech was by no means fully reported in your issue of the 16th inst.; if it had been, you would have seen that your request for information as to how more pressure was to be put upon the railway companies was, to some extent, answered in anticipation. Before, however, going into this matter, will you allow me to say that I have no antagonistic feeling towards the Affiliation scheme. I warmly supported our own Society joining, and, because I see the large possibilities involved in the idea, I am anxious that it should not remain a sentiment, but become a living reality.

In my remarks I broadly criticised the report recently issued by the Committee, a document which does not show that the delegates have been unduly energetic during the last two years. My point about reduced railway fares to members of affiliated societies was only one of the many which I raised; but as you seem to have only one idea—and that, you will excuse my saying, a somewhat ridiculous one—as to how this question should be pushed, I will, with your permission, discuss it briefly.

You say that railway directors have their shareholders' interests to consider, and may fear a reduction in their returns if they concede this privilege to photographers. This has surely not been their experience in other directions, for, just as facilities for cheaper travel have been given, such as improved third class, tourist tickets, cheap excursions, &c., so the returns of the companies have increased by leaps and bounds. A large cycle club have, by refusing to accept a *non possumus* from the companies, at last succeeded in obtaining a very valuable concession in the rates charged for the carriage of cycles, and members of angling clubs—I venture to say by no means so large and important a body as photographers—are allowed to travel at greatly reduced rates on production of their membership ticket, and if accompanied by their tackle. I think that it cannot be gainsaid that, if societies could arrange outings at less expense than they are able to do at present, not only would many more members avail themselves of them, but they would take place more often. Judging by our own experience, too, excursions are often arranged which do not involve the expense of a railway journey, when, under more favourable terms, the companies would be patronised. In another portion of your same issue you speak of the non-success of the Saturday afternoon outings of several societies. I believe that, if reduced fares were granted by railway companies, you would never have to suggest that such valuable aids to photographic work should be abandoned. It is useless to speak of the ordinary cheap excursions as a facility for photographers, whose best work, speaking broadly, is not done in the presence of the "madding crowd," or of the arrangements for pleasure parties when a large number of photographic outings are undertaken by fewer than the twenty persons required.

The "pressure" which I wish to be brought to bear upon the railway authorities is a persistent pointing out to them, in season and out of season, that it is as much to the advantage of their companies as to photographers to grant the facilities asked for; when they see this, the reform will come. In the recent report of the delegates, no mention whatever is made of the subject. What I asked at our meeting was, Is the matter dropped? are the delegates satisfied with the present position of affairs? If so, this is precisely how *not* to do it; let them continue to press the matter to the front, and let them be supported by a largely increasing number of societies joining and sending up representatives to the central body.

I suggested at our meeting other ways in which the Affiliation might be made more popular. Considering that it is supposed to be a brotherhood of societies, why should not at our exhibitions a class be set apart for members of affiliated societies, just as we have a members' class and an open class? Further, why should not a member of an affiliated society, on visiting a neighbourhood where there is another society, also affiliated, be able to go to the secretary or other member of such society and obtain any information on matters photographic which he may require. Thus would the brotherhood be not only a sentiment on paper, but a reality.

There is another question involved in your somewhat bitter criticism of my remarks, and your offer of sympathy to the poor delegates. Are members of affiliated societies to be debarred from criticising the work of the Committee, and must they simply vote their guineas year by year and ask no questions? The biennial report just issued, with the exception of the question of judging at exhibitions, a valuable work for which I give the delegates full credit, contains no record of work done; it is, in the main, a repetition of the glorious promises of the prospectus. Well, we have contemplated the future of the scheme for two years, now let us realise something. Depend upon it, the societies concerned, especially the provincial societies, who are debarred from participation in London lectures, the library, &c., will presently begin to ask what benefits they derive from affiliation, and, if they cannot see anything tangible, will begin to drop out. I am fully aware that great things move slowly, but they *do move*. Let us all put our shoulders to the wheel and push the good old chariot along. Apologising for trespassing upon your space, I am, yours, &c., WILLIAM H. DAWSON.

135, *Herbert-road, Woolwich, March* 28, 1894.

THE BENEVOLENT: A SUGGESTION.

To the EDITOR.

SIR,—As the season has now commenced with the coast photographers, I would offer a suggestion which might be worth the consideration of ths Secretary of the Photographers' Benevolent Association, viz., that he should provide coast photographers with subscription-boxes, such as the Travellers' Association have in hotels, and that the said photographere

should make a small charge for the use of their dark room from amateurs who wish the accommodation.

I have already made a charge of sixpence each from five gentlemen, and they think my idea a very good one. On previous years I never made any charge for the use of the dark room, but I thought that this year I would make this new departure.

Should this proposal meet with the approval of the "Photographers' Benevolent," I shall be pleased to have a box from them, and, if not, I shall collect the money all the same, and let them have it at the end of the season.—I am, yours, &c., C. SWEET.

Rothesay, March 31, 1894.

P.S.—Although I have only made a charge of sixpence for the use of the dark room, I would not be inclined to refuse more if the parties were generously inclined. C. S.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

Crippin & Co., Morecambe.—*Photograph of the Bolton Wanderers' Football Club.*

Nathan Smedley Kay, Southport.—*Two photographs of Rev. Charles Albert Berry.*

Eleanor Blackburne, Chester.—*Photograph of Oil Painting, by G. Beechey, of General Sir Stapleton Cotton.*

Blake & Edgar, Bedford.—*Photograph of His Grace the Duke of Bedford unveiling the Howard Memorial Statue at Bedford.*

A. L. KNIGHTEN.—Precipitate with potassium sulphide.

WESTON.—Please send date and number of the specification.

T. PROTHEROE.—The address you want is Trapp & Co., Budge-row, E.C.

BLACK AND WHITE.—See articles by Redmond Barrett in our volume for 1888.

PLYMOTHIAN.—See answer to A. F. P. For lantern slides a good tone is got by development alone; but they may be often toned with gold with advantage.

CHANGE OF ADDRESS.—T. Miller, formerly of 141, Broughton-road, Salford, has removed to larger premises at 29, Blackfriars-street, Manchester.

COL. J. E. GUBBINS.—Communicate with Mr. J. R. Gotz, 150, Shaftesbury-avenue, who would doubtless be able to supply you with what you require.

CAMERON & SMITH.—Messrs. Penrose & Co., Amwell-street, E.C., will, doubtless, be able to supply you with the small copper plates for photogravure.

A. W. S.—The treatment will depend upon what the bellows is made of. We should recommend you to consult the maker; he will advise you as to the best treatment.

DRIED 'UN.—These plates are suitable for slides as well as for negatives. Better make a trial in order to ascertain the exposure. Ordinary spirit varnish will be suitable.

BRITISH.—So far as we can understand the query, such a light can be used, provided the studio is fitted with suitable blinds and reflectors. If we saw a plan of the studio, we might understand it better.

B. ROBSON.—We have heard nothing for the last year or two of the photographic paper that the Willesden Paper Company proposed to introduce some time ago. Why not write to them? The address is Willesden Junction, N.W.

X. Y. Z.—Better wait and see the picture at the Royal Academy, if is hung. Then, if it is a copy of your photograph, and you can establish the fact, you can recover damages or penalty, which will also entail forfeiture of the painting to you.

C. W. T.—It is not possible for any one to say, by merely looking at a small piece, whether the mounts are trustworthy for gelatino-chloride prints. If they are known to cause albumen prints to fade, they should certainly not be used for gelatine.

A. F. P.—1. Collodio-albumen is not superior to wet collodion for lantern slides. 2. Yes. 3. It is much slower than wet collodion. 4. Quite suitable for outdoor work. 5. The developer we have most used is the acid pyro one with silver added. It is not, however, the quickest.

B. KINGS asks "if professional portrait photographers in London give time exposures, or do they employ instantaneous shutters in their studios; and, if the latter, whose shutters are most generally used?"—"Time" exposures are given. Instantaneous shutters are rarely, if ever, employed in studio practice.

THOS. CRAWLEY somplains of ——'s double albumenised paper cracking. He says that when the prints are laid out to dry they curl up so much that, when they are opened out, they are a mass of small cracks.—If the prints are dried between blotting-paper or boards, they will be kept flat and will not crack.

W. A.—1. If the colours are of the proper kind, they will not come off, provided the instructions for using them be carried out. 2. Use the largest stop that will give the desired definition in the different planes. 3. A little below the head for a sitting figure, and a little above the middle of the body for a full-length standing figure.

T. HOPKINS.—What is known as gun-cutton is not well adapted for making collodion for any photographic purpose. The right thing is what is known as soluble pyroxyline. It may be obtained at some photographic warehouses and of all operative chemists. The explosive cotton is only partially soluble in alcohol and ether, and what does dissolve does not form a suitable film for negative work.

GLEN asks: "Can you inform me, in reference to the copyright of photographs, who is the responsible party should a customer bring a copyright photograph to be reproduced for advertisement or book illustration; is it the block-maker, the printer, or the publisher?"—If the person incurring a penalty for infringement is meant, we should think that the publisher would be responsible. The question, however, is one for legal opinion.

T. MCD.—The sketch shows that there is no fault in the design of the studio or the way the blinds are fitted. The portrait is, however, very faulty, and that is due to the improper lighting of the sitter. Far too much direct front light has been admitted, which is the cause of the flatness in the face. If the whole of the light at the west end were dropped out, it would be a great improvement, and at once remedy the greater part of the evil.

J. W. B.—As the second brand of plates you name is marked with the Hurter & Driffield system of speed determination, you had better procure and use the actinograph sold by Messrs. Marion & Co. Having therewith ascertained the time of exposure required, you will be able to compare it with that which you give with the other plates named. We agree with you that it is a pity that one standard of sensitiveness is not used by all plate-makers.

W. HOLMES asks what material is used to whiten the glass of photographic studios?—Often the glass is painted over with white paint and then stippled with a dry brush; but a preferable method is to mix some common whiting with starch paste and coat the glass with that, stippling it over as in the case with paint. The advantage of this is that the coating can at any time be easily removed, which is not so easily done with paint. Moreover, the latter is liable to turn yellow, and thus entail prolonged exposures.

OPERATOR says: "In answer to a letter I sent a number of specimens to a photographer in the Midlands, and have heard nothing since, although I have written twice and sent stamps for their return. Can you tell me how to act?"—Our correspondent has not complied with our regulation by sending his name and full address. However, without doing what we otherwise should have done, we will, under this case of hardship, so far depart from our rule of not replying, and advise him to write directly to the Superintendent of Police for the district, giving full details.

R. BELCHER writes: "I am going to experiment in photogravure intaglio. Will you please tell me how to print from the plates when I have made them? Is any special appliance required for the work," &c.?—Photogravure plates are printed from after the ordinary method of copper-plate printing, and necessary plant for the work is requisite. Copper-plate printing is work that requires considerable skill, and instruction in it does not come within the province of a photographic journal. Our correspondent had better take his plates to a copper-plate printer to get impressions from them. This is what most workers find it advantageous to do.

XENO writes: "I see it is becoming very general for photographers to obtain apprentices with a premium, and, probably, pay them a small salary. Of course, this must considerably lessen one's working expenses these hard times. I think of getting two apprentices in place of an assistant, to whom I pay thirty-five shillings a week. Will you kindly tell me what premium I should get for, say, five years, and how much I should pay the apprentices a week after the first year or two, during which I suppose they are not paid anything?"—We have no knowledge of this branch of the business, but presume that much will depend upon the status of the establishment and what its proprietor is capable of teaching. Perhaps some reader can enlighten our correspondent.

TOURIST.—1. Inquire for particulars of Messrs. Adams & Co., Charing Cross-road; Messrs. Newman & Guardia; or Mr. Gotz, Shaftesbury-avenue, W. 2. Place's shutter is obtainable of Mr. J. Place, optician, Birmingham. We do not know its measurements or price. 3. We have not had any experience of the Queen films. 4. Hurter & Driffield's actinograph is obtainable of Messrs. Marion, Soho-square. The price, we believe, is about 12*s.* 6*d.* 5. Pack the films tightly, face to face, in an hermetically sealed box. 6. Better study Murray's, Black's, or Baedeker's guide-book. Devon and Cornwall present such a large and varied field for photographic work that it would be difficult, if not impossible, for us to advise you the "most desirable" route.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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THE COLLODION PROCESS.

Practical Directions for Stripping Large Films.

Before dismissing the subject of stripping collodion films from off the glass plate, we think it well to give a synopsis of a method that has been much practised in America, having found great favour there among photo-lithographers and others. There is no essential difference in the principles underlying it and those we have described in a previous chapter; but sometimes little matters in detail form the difference between success and failure.

But, first of all, a word or two on substrata. When a collodion negative is taken with the intention of its being afterwards stripped from the glass support, it is desirable that the plate, after being cleaned, be rubbed well over with powdered steatite or French chalk. This treatment has a two-fold property, in fact it may be considered as possessing properties quite antagonistic to each other, for it causes such an adhesion of the collodion as to enable it to resist what might otherwise be considered a decidedly loosening action engendered by, possibly, a series of intensifications and intermediate washings. No matter what these may be, the film adheres throughout. The antagonistic property of French chalk is this, that when the film is dry, it becomes a very easy matter to strip it from off the plate and in the preparation of a plate intended ultimately to be employed. But, while French chalk is such an excellent and easily applied substratum, our readers will know that a solution of white wax answers equally well, so far, at any rate, as regards stripping facilities.

Having prepared a plate with the substratum, apply a coating of plain (uniodised) collodion of a good body—that is, one containing from six to eight grains of cotton to the ounce of solvents, and, when well set, lay the plate in a flat dish of water, imparting a rocking motion to the same until the water is seen to flow smoothly over the surface without any seeming greasiness being apparent. Instead of being washed in a dish, it may be done equally well by a rose faucet attached to the ordinary water tap. For that matter, the washing may be done by a common garden watering pail out in the open daylight—a method of which we have just proved the efficacy by doing so on an 18 × 15 plate.

After allowing the water to drip off, coat the surface with diluted albumen, in the proportion of the whites of two eggs to a pint of water, the whole having been well beaten up together. When dry, the plates may be stored away till required for use, when they are coated with iodised collodion, sensitised, exposed, and developed in the usual way. Having been washed, a second application of the diluted albumen is made, and the negative is dried.

It is now ready for the final varnishing with plain collodion in which have been dissolved six or eight drops of castor oil. This is allowed to become dry.

To remove from the glass, run a knife around the margin, when the combined film will leave the plate with facility. The pellicular negative will be tough and strong, and, owing to the presence of the castor oil, will remain flaccid, and not be inclined either to curl or to crumple.

One special advantage of this system, hinted at in a previous chapter, is the excellent manner in which a pellicular negative lends itself to the preparation of surfaces for mechanical or process printing—such as collotype and photogravure—without reversing the position of the scenes, whether figures or other compositions, on the finished prints; for with a collodion pellicle it will be readily understood that there is absolutely no practical difference in the sharpness and gradation obtained, when either the front or the back is in contact with the sensitive surface.

AN IMPORTANT DECISION ON COPYRIGHT LAW.

Judgment on an important point in Copyright Law has just been given in the Chancery Court, in connexion with what has become known as the "living picture" case, or cases. Briefly stated, the facts are these:—The plaintiff, Franz Hanfstaengl, a fine-art publisher in Munich, and having a branch house in London as well as in New York, is the owner of the copyright in a number of pictures, photographic copies of which are very familiar to us in this country. Two or three months ago the Empire Palace Company reproduced, from the photographs, some of these works on the stage as *Tableaux Vivants*, the backgrounds being painted scenes, and the figures, living beings, posed as they were shown in the originals. An injunction was applied for to restrain the exhibition. It was refused, as to the living figures, on the ground that the representations were not of a permanent character. On the question of the backgrounds, the defendants gave an undertaking to keep, until the trial or further order, photographs of them, also an account of all moneys received for admission at entertainments at which they were used. Against this decision the plaintiff appealed, and the appeal was dismissed; and so the matter rests, for the present, as far as the Empire Theatre is concerned.

The *Daily Graphic* and also the *Westminster Budget* gave illustrations of some of these living pictures, and injunctions were applied for against the proprietors of both papers to restrain the infringement of the plaintiff's copyright. It may, *en passant*, here be mentioned that, under the International Copyright Act of 1886 and an order in Council of 1887, it is

enacted that the owners of copyright in all countries comprised in the Berne Convention enjoy the same rights and privileges in foreign countries as they do in their own. Therefore the plaintiff, so far as the law is concerned, is on the same footing as if he were a British subject. The cases were argued before Mr. Justice Stirling about a month ago, and in the end judgment was reserved, and was only delivered on Friday last. The Court granted an injunction in each case "to restrain the defendants and their agents from printing, publishing, or offering for sale, or otherwise disposing of, any copies or colourable imitations of the copyright pictures of the plaintiff."

During the hearing of the cases several points interesting to the owners of copyright, photographic or otherwise, were raised. A case was cited which, no doubt, had a great bearing on those before the Court, as to whether copies of representations of pictures—although the representations themselves were not, as in the case of the Empire pictures, infringements—were infringements of the copyright in the originals. The case was that of Turner *versus* Robinson. In that instance the plaintiff was the owner of the copyright in a certain picture, *The Death of Chatterton*. The defendant, a photographer, arranged in his studio a garret scene like that in the picture, and posed a living person in the same position as that of the figure in the painting, photographed it, and published the copies. In an action that was instituted, it was decided that the copyright in the original painting had been infringed, and this decision was upheld on a subsequent appeal.

In delivering judgment, Mr. Justice Stirling said, quoting Lord Blackburn: "When the subject of a picture is copied, it is of no consequence whether it is done directly from the picture itself or through intervening copies; if, in the result, that which is copied be an imitation of the picture, then it is immaterial whether it be arrived at directly or by intermediate steps." A question in German Copyright Law was raised, and it was argued that the plaintiff could not enjoy greater privileges in this country than he did in his own, it being contended that the German Copyright Law permitted an illustration to appear if it be subsidiary to and serve only to illustrate the text. But even if that is the case, and it seemed to be denied by the other side, the learned Judge remarked, "So far from being subsidiary to and serving only to illustrate the text, these illustrations constitute the main feature, and that the text is, in truth, subsidiary to, and serves to illustrate, them."

Section 2 of the Copyright Act of 1862 provides that "nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to present any scene or object, notwithstanding that there may be copyright in some representation of such scene or object." On this subject Mr. Justice Stirling remarked that, "if the artist employed by the newspaper had seen fit to make a sketch of the theatre as a whole at the moment when one of these living pictures was being represented, it may be that the Court would not interfere, even though the sketch included as part of it a delineation of the *tableau*. That, however, is not the state of the facts with which I have to deal; in both these cases the illustrations represent the pictures only; in both papers they are described at the foot or the head as 'living pictures at the Empire Theatre.'"

According to the above section of the Copyright Act, it is clear that, in taking the photograph of the interior of a building, for example, if some copyright pictures were on the walls, it would not be an infringement to include them in the picture, provided, of course, they were only subsidiary to the general view. Again, in photographing a street scene, it would not be an infringement to include in it any copyright works that might be seen in shop windows, or elsewhere, supposing they were merely subsidiary to the view depicted.

ONE-SOLUTION DEVELOPERS.

By the term "one-solution developer" we understand, at the present day, a developer that is put up in a concentrated form, and, only requiring dilution with water for use, is practically guaranteed to meet all the requirements and all the contingencies of every-day practice, whatsoever they may be. Whether such a preparation has ever fulfilled the promises made for it we cannot say, but we scarcely think we have met it yet. The fault, perhaps, does not lie so much with the authors of the one-solution formulæ—the backers, so to say, of the principle—as with the users, who are too prone to accept in the widest sense possible any statement as to the general applicability of such preparations.

Going back scarcely more than a dozen years, to the days of wet collodion, we had then purely and simply a one-solution developer as the sole resource of either the portrait or landscape photographer — a developer, moreover, that was susceptible of no modification in use to adapt it to the immediate requirements of the case, if the plate were under or over-exposed, although the formula might be varied beforehand, within narrow limits, to meet any special class of work. In those days, in fact, accuracy of exposure was the one element in the production of a picture that went farther than all the rest to ensure success.

On the introduction of gelatine plates, the first great claim in their favour was their wonderful "latitude," that is to say, the power they offered of correcting errors of exposure by modifying the development. This was the first point that struck the new convert to "dry plates," the range and power, the latitude, that alkaline pyro gave in comparison with the iron developer with which he had been familiar for so many years; but, compared with the pyro development of ten or twelve years ago, the one-solution preparations of to-day, as used by the majority of those who do employ them, offer no such range or latitude, but, on the contrary, necessitate almost as much care in the adjustment of the camera exposure as was the case with wet collodion.

But is this as it should be? We are speaking of no particular form of one-solution developer, either of published or secret formula, when we say that it certainly should not be so, nor is there any necessity that it should, if those who use such preparations systematically and regularly would do so intelligently. Not only when travelling, but more especially to the amateur who only turns to development at occasional and irregular intervals, the concentrated developer in a single solution would be an undoubted convenience, could he be always certain of his exposure. To the happy-go-lucky individual who most frequently pins his faith and trusts his all to this form of developer it can scarcely bring greater disaster than would the "rational" or any other system that requires judgment; but singularly enough, under the very conditions where it would be most useful and amongst the people who would most benefit by its use, the one-solution developer is practically unknown or unemployed. Professionals, in fact, who are in the best position to accurately time their exposures, and who are therefore the ones who should derive the greatest

advantage from a developer of fixed strength, are the very ones who, as a rule, prefer to adhere to the old style of separate solutions.

Yet at very little extra trouble any of the really good formulæ for single-solution developers can be made very pliable in nature, and, though they may not offer the same range of power as the three-solution pyro developer, yet give quite sufficient margin in the matter of exposure to bring them within the bounds of practical utility for all-round purposes.

The fault with most of the developers of the class to which we are alluding is that the only instructions proffered for their modification to meet varying circumstances are to dilute them to a greater or less degree. Now, although this may be all very well so far as concerns the energy or developing power of the solution—that is to say, so far as regards its power of bringing out an image with a given exposure—it has a different bearing upon its capability of rendering density. In other words, although, by varying the degree of concentration of the developer, slight errors of exposure may be rectified, in too many cases it will be found that the density and gradation of the image are not all that can be desired.

In the instructions given with many of these formulæ, however, we find allusion made to "accelerating" and "restraining" solutions that are to be kept in reserve in case of emergency—that is, in case of under or over-exposure. Among a very large number of amateurs who employ regularly one or other of these prepared one-solution developers, we have met as yet but one who systematically keeps by him these emergency solutions; and yet with their aid, combined with variation in the strength of the original solution, almost as much latitude can be obtained as with the old system of "ten per cent. solutions." We have recently made a trial between one of the commercial single-solution developers and pyro worked upon the rational system, using in conjunction with the former special solutions of alkali and of bromide, with the result that, however the exposures might be varied, there was quite as much control over the so-called single-solution developer as over pyro, and it proved capable of giving equally good results.

Of course, under these circumstances, it ceases to be a one-solution developer; but that at the present moment is not the question. For general purposes, the one-solution remains, and it is not every exposure we make that we expect to be wrong. In the majority of instances the single-solution will suffice to do the work required, and the two auxiliary solutions, if at hand, enable us to rectify accidental errors that would otherwise be irremediable.

We may sum the matter up by saying that, while the single-solution developer, in the hands of one who understands how to use it, may be as efficient as any other form, it leaves much to be desired when heated, as is too often the case, as an automatic developer that will do any and everything required of it; but perhaps, in the same hands and under the same circumstances, any other style of development would prove equally unsatisfactory.

Estimation of Silver in Commercial Dry Plates.—An important communication on this subject by Mr. A. Haddon and Mr. F. B. Grundy is to be made before the members of the London and Provincial Photographic Association on Thursday evening next, April 19. A matter of such interest is sure to attract a good attendance. We may remind our readers that visitors are always welcome at the Association's meetings, which are held every Thursday, at eight o'clock, at the Champion Hotel, Aldersgate-street, E.C.

Luminous Insects.—Photographs have before now been produced by the light from glow-worms: but in the examination of a particular insect—*Photinus coruscus*—which emits luminous rays, Mr. A. F. Miller has shown (in the *Transactions of the Astronomical and Physical Society of Toronto*) that the specimens examined did not seem to give out any blue or violet light, thus supporting Professor S. P. Langley's conclusion that nature produces the most economic kind of light, which, translated broadly, may be supposed to mean that, as the insect has no need for photographic light, it does not produce it. It is, however, to be stated that photographic experiments have not been tried with this *Photinus*.

The Action of Water on Glass.—We have before pointed out that glass is by no means the inert chemical substance it is usually supposed to be. Herr F. Kohlrauch has examined various kinds of glass to ascertain their relative solubility. He finds that, of the alkali and silica dissolved, the former increases in proportion to the latter the greater amount of glass dissolved. Among the new glasses made at Jena is one for "apparatus." He found that a flask of this glass that he examined was not insoluble, but that after two days' exposure to water it lost per square decimetre ·005 milligramme; after two hundred days, ·066 milligramme; after twenty-four hours, at 94° C., ·8 milligramme. It is evident from these facts that, in conducting special experiments with emulsions, it is quite possible that the amount, slight though it be, of alkali dissolved from the glass vessel containing it might have an appreciable effect on the proportions of the "cooked" result.

Improvement in Diffraction Gratings.—Professor Rowland's well-known grating, which, as our readers are aware, consists of lines ruled on a concave surface, is subject to the objection of exhibiting astigmatism, an advantage in respect to dust, as it gives no lines from that cause, and also is favourable to the spectrum of minute points of light, which it widens out into a band; but for the same reason it is inapplicable for the simultaneous observation of two spectra by the usual method. By a special device, these defects are able to be avoided in photographic comparison spectra, but recently Dr. J. L. Tirks, of Amsterdam, has devised a slight modification by means of which comparison spectra may be easily examined. He simply places the prism for giving the second spectrum some distance from the slit. He further suggests that the advantages described as peculiar to the Rowland grating may be obtained with an ordinary dioptric spectroscope by creating astigmatism by means of a slight spherical convexity to one of the prisms.

The Annual Exhibition of the French Physical Society took place the end of last month, and it must be said that some of the most attractive exhibits were those in which photography took a part. M. Lumière's coloured photographs, by the Lippmann method, were greatly admired; one represented a chemist's laboratory, and is said to have depicted all the varied colours there to be seen in a perfect manner. A little girl reclining among green foliage (which required only four or five minutes' exposure) came out with "startling reality." M. Marey was to the fore with some of his wonderful photographs of moving objects—men, domestic animals, insects, jets of water, &c. M. Mach's photographs of flying bullets, with the aërial waves they produce, were exhibited by means of the optical lantern. Photographic clouds in all varieties were exhibited, this being a branch of photography much followed of late, and for the particular purpose of obtaining them M. Echassoux exhibited a photographic theodolite.

The London and Provincial Photographic Association.—Probably no more useful Photographic Society than the familiarly known "L. and P." exists in London. The discussions which take place and the subjects which are brought before its meetings are usually of a practical and technical nature, and photographers of all degrees of knowledge can hardly fail to derive much useful in-

formation and instruction from them. Many country and American visitors are attracted to the "L. and P." meetings in the course of the year, and we have frequently heard them express pleasure at having been present. During the last twelve months or so, such able men as Mr. A. Cowan, Mr. J. Cadett, Mr. G. F. Williams, Mr. A. Haddon, Mr. F. B. Grundy, Mr. Birt Acres, Mr. J. Howson, Mr. S. H. Fry, Mr. E. Howard Farmer, Mr. P. Everitt, Mr. W. E. Debenham, Mr. Thomas Bolas, and others have made interesting and valuable communications to the Association. The subscription is only five shillings a year, and the Hon. Secretary is Mr. T. E. Freshwater, of 45, Torriano-avenue, N.W. Photographers desirous of passing a pleasant, profitable, and cheap evening once a week in the discussion of photographic matters could not do better than seek admission to the "L. and P." The meetings, as we have said, are held on Thursdays, at eight o'clock, at the Champion Hotel, Aldersgate-street, E.C.

The "L. and P." Attacked.—In the foregoing paragraph we have been at some pains to place before our readers an idea of the general nature of the "L. and P." and its proceedings, before making a brief reference to other matters connected with the Association of a less agreeable kind. Some months back the Association, by a large majority of the members present at the particular meeting at which the matter came up, decided on the exclusion of ladies as ordinary members. This fact, coupled with the circumstance that smoking and alcoholic refreshment are permitted at the meetings, seems to have provided a contemporary with a text upon which it has based a series of attacks upon the Association, the substance of which is summed up in our contemporary's own words: "Those who objected to the admission of ladies openly avowed that they objected to the admission of women because it would interfere with the events ordinarily incident to the free drinking of intoxicating drinks, and would practically break down the drinking custom." There is a great deal more of the same kind, which we shall not quote. Nobody has a more intimate knowledge of how the proceedings of the "L. and P." are conducted than ourselves, or are in a better position to refute any misstatements of which it is made the object. Upon the latter course, however, it is not necessary for us to enter, as the Association itself has taken the matter in hand in the most forcible manner. But, in justice to that excellent body, as well as for the information of those who are not members, we feel it our duty to state, as we do from our own knowledge, that the standard of behaviour at the "L. and P." meetings is always such as we are accustomed to expect and find in any body of gentlemen habitually assembled together for the discussion of mutually interesting subjects. Any insinuation to the contrary is simply untrue. We have always entertained a high esteem for the "L. and P.," and shall continue to support so admirable and useful a Society.

The Newcastle International Exhibition.—The International Photographic Exhibition, promoted by the Newcastle and Northern Counties Photographic Association, will be formally opened to-night (Friday) by the Mayor of Newcastle at the Art Gallery, Granger-street. We understand that the number of pictures sent for competition is extremely large, and that the sections devoted to apparatus, appliances, photographic printing, &c., are well patronised. The Exhibition remains open until April 28, and the following are some items of the evening programme:—Monday (April 16), at eight p.m., Exhibition of Prize Lantern Slides; Tuesday (April 17), at eight p.m., Illustrated Lecture, *The Beauty Spots of the North Tyne*, by J. P. Gibson, Esq.; Wednesday (April 18), at eight p.m., Exhibition of Lantern Slides sent for Competition; Thursday (April 19), at eight p.m., Illustrated Lecture, *Photography! What it is—What it has done, and the Men who have made it*, by J. Brown, Esq.; Monday (April 23), at eight p.m., Exhibition of Lantern Slides; Tuesday (April 24), at eight p.m., Illustrated Lecture, *Instantaneous Photography*, by W. Parry, Esq.; Wednesday (April 25), at eight p.m., Illustrated Lecture, *A Holiday in Holland*, by Mrs. W. Waters Stainthorpe; Thursday (April 26), at eight p.m., Exhibition of Prize Slides.

Dust and Haze.—A very interesting paper dealing with this topic, by Mr. John Aitken, F.R.S., was read before the Royal Society of Edinburgh a little while ago, and deserves note on account of the very clear exposition it gives of the causes of that haze which in so many cases is fatal to crisp and clear photographs. Dirt has been called matter in the wrong place, and for photographic purposes, when the atmosphere is dirty, the resulting negatives may be similarly described. It will be useless to burden our readers with the details of what is truly a most interesting paper; and we will therefore only indicate such points as have a practical bearing on "fog" probabilities when starting out for landscape work. We need scarcely say that haze is produced by the presence in the air of a number of distinct, separate particles of dust—the greater their number the greater the haze. But—and here prognostics may be made—"double the number of particles are required to produce the same amount of haze when the air is dry as when it is dampish. It will also be noticed that the transparency of the air is roughly proportioned" to the wet-bulb depression. Hence, when contemplating outdoor work, a glance at a wet and dry bulb thermometer will show the probability of fine or hazy atmosphere—a very useful hint, for few things are more annoying than to take a long journey on photographic work intent, and to find on arriving at one's destination that the atmosphere is unfavourable for any view in which distance is included. It is well known that the air is usually clearest some little time after a smart shower. Mr. Aitken shows that this is to be expected, those "areas where most clouds form, and most rain falls, will have the greatest purifying influence."

Lectures on Photography in Colours.—Under the auspices of the Societies affiliated with the Photographic Society of Great Britain, two lectures will be delivered upon *Photography in Colours*, by Mr. E. J. Wall, at the Cordwainers' Hall, No. 7, Cannon-street, E.C. (by permission of the Worshipful Company of Cordwainers), on Friday, April 27, and Monday, April 30, 1894, at eight p.m. During the lectures it is hoped that examples of every process of photography in colours will be on exhibition. The following is the syllabus:—Lecture I.: Colour—its nature—the spectrum—early experiments by Seebeck, Senebier, &c.—Herschel—Hunt—Becquerel—Niépce St. Victor, Poitevin—Veress—Difficulty of rendering the colours permanent—this finally achieved by Lippmann—his method and arrangements—theory of his process—later improvements thereon—exhibition of photographs in colours by Lippmann's process. Lecture II.: Composite heliochromy—the theory of colour sensation—suggestions of Collen—Ransonnet—Ducos du Hauron's patent—Cros—Poirée—Failure of these experiments and its cause—Vogel's discovery of colour sensitising plates—Vogel's process—Stolze's suggestion—Ives' process—Bligh Bond's results—Kurtz—Vogel's process—its theory and manipulation—three-colour printing and optical projection—exhibition of three-colour prints, lantern slides, and the heliochromoscope. Admission to members of affiliated Societies will be by tickets, to be obtained beforehand from the Hon. Secretaries of their Societies, one shilling the two lectures. Non-members will be admitted by tickets, obtainable only on application to Mr. R. Child Bayley, Secretary, 50, Great Russell-street, Bloomsbury, two shillings and sixpence the two lectures. Cordwainers' Hall is within one minute's walk of St. Paul's Cathedral.

THE NEW METHYLATED SPIRIT.

A QUESTION arose at a recent meeting of the London and Provincial Photographic Association, as to the effect of the new mineralised methylated spirit when used for drying negatives. I have used it for that purpose several times lately, but, before I had seen any mention of the matter in last week's JOURNAL, I had decided never to attempt it again.

In almost every case the result has been injury of some kind to the negative, in the shape of indelible markings of one sort or another, and I think, in every case in which the spirit has been used,

I have had to rewash the negative and allow it to dry in the natural manner.

The most common defect produced is a patchy, opalescent appearance, chiefly visible from the back of the negative, and which I first attributed to the precipitation of hyposulphite remaining in the film from insufficient washing, but this I have since abundantly proved is not the cause. In the first place, if the film be again washed, the opalescence will disappear, as might be expected if it were crystalline matter; but, if the negative be redried with alcohol, it reappears, though in quite a different form and position, which shows that it can scarcely arise from hypo, since the second washing would surely remove any traces that remained. In two instances where this opalescence has occurred, washing has failed to remove it, and only on rewetting with spirit did it disappear, to return, however, when the film was dried.

But the most remarkable case, and the one that finally made me resolve to relinquish the practice, somewhat resembles that described by Mr. Bedding at the meeting in question. Hitherto, I had only employed this method of rapid drying when I was in a hurry to see a print from a negative, and, that end gained, I rewashed the negative, to remove the opalescence invariably present. But on the last occasion I had to intensify five negatives, all of which had been developed, washed, and generally treated in precisely the same way; had, in fact, gone through the washing operations in the same rack—with one exception, one of them was dried off with spirit and rewashed.

Immediately before intensification it would have been impossible to say which of the five had undergone drying, as not the faintest sign of the treatment or its hidden consequences could be seen, but on passing the negatives through the mercury solution, while four of them were all right, the fifth was decidedly all wrong. The mercury appeared to act in an irregular and patchy manner, and, in fact, to produce an appearance precisely similar in character to that already referred to. The negative was left in the solution in the hope that time would equalise matters, but after a couple of hours' immersion the unevenness was as bad as before.

But one hope remained, that the irregularities might disappear under the action of the ammonia, but instead they took the form of brown, patchy stains, accompanied by an appearance like "ripple marks" on the sand, and similar to the "ridges" I suppose mentioned by Mr. Bedding. The image was treated with hydrochloric acid, bleached, and rebleached, but still the irregularities remained immovable, so I have given up the use of methylated spirit for drying purposes.

With reference to Mr. Teape's question as to the purification of the spirit by means of permanganate of potash I am afraid it is no use so far as the removal of the naphtha is concerned. When I first suggested that treatment some two or three years ago, I had been experimenting with mixtures of ordinary methylated spirit and benzoline, which behave rather differently from the new spirit as sent out by the methylators, when subjected to that treatment.

If a quantity of the new spirit be diluted with water, it of course becomes "milky," and if the mixture be passed through a filter paper it still remains "milky;" but if a portion of it be shaken up with a few crystals of permanganate, or if a quantity of solution of the latter salt be added to a fresh quantity of spirit and allowed to stand for a short time, until the purple colour has given place to a dirty brown, and a heavy sediment has formed, the liquid will pass through the filter perfectly *clear*, though of a purple or pink tint. If this be again allowed to stand, it will turn brown and muddy, but upon refiltration will pass through bright and clear, and this time probably colourless. The addition of more water fails to produce any further milkiness.

This certainly looks as if the offensive "naphtha" was removed by the permanganate, but a different course of treatment gives a precisely opposite result. If a few crystals of permanganate be added to a quantity of *undiluted* spirit, a pink tint is first given to it, but this quickly passes into brown, and, if the mixture be well shaken for a few minutes, it quickly develops a heavy brown sediment. If this be passed through paper, the filtrate will be at first perfectly clear as before, and faintly tinged with the colour of permanganate, but this almost immediately passes into the brown and muddy state showing that a change is going on constantly, and that, as rapidly as the permanganate is dissolved by the water in the spirit, it is decomposed by the spirit itself. The filtrate, if again mixed with fresh crystals of permanganate, very soon becomes as filthy as before; but, if refiltered after standing a little while without any fresh addition, it will again pass through clear, and, if the whole of the permanganate is decomposed, colourless also. But—and here is the point—if water be added, the mixture become just as cloudy as before the treatment, showing in this case that the naphtha is *not* removed.

The change that goes on is, no doubt, a slow but continuous oxidation of the alcohol, with the gradual formation, amongst other products, of aldehyde and acetic acid; so that the process of "purification" can scarcely be deemed a satisfactory one if the spirit is to be used for emulsion purposes, more especially as the obnoxious naphtha seems to be the constituent that appears to suffer least from the treatment.

It is just possible that those who are bold enough to undertake the task may get rid of the naphtha by treating the diluted spirit with permanganate of potash and then distilling it; but I am afraid the Excise authorities would come down on them, as they did on Mr. Eschwege years ago. So the matter remains where it was; if you have not a "permit" for the old methylated, you must use pure alcohol.

W. B. Bolton.

PHOTO-MECHANICAL NOTES.

A satisfactory sign of the times is the increased attention that is being given to the question of utilising dry plates for process work, and the recent leading article in this Journal should stimulate further interest. For my own part, I firmly believe in the eventual possibility of discarding the wet-collodion process, admirable as it is in many respects. Long ago I made a determined attempt to use dry plates for this kind of work, and succeeded to my own satisfaction; but, when it came to requiring other people to do the work, the use of dry plates became a disheartening and discouraging waste of time and money, and I was only too glad to let the operator get back to the old wet-plate bath and its messy concomitants. My experience is not singular. A friend in a large way of business uses dry plates exclusively for half-tone work, but he can get no operator to meet his requirements, so that he has to do all the negative-making himself, with the assistance of a youngster whom he is training up to his own methods. In most cases where dry plates are being used successfully it will be found that the operator is or has been a dry-plate worker, and is not hampered with wet-plate traditions. Thus it comes to this, if dry plates are to be adopted for process work, it will be necessary to train up the coming generation of operators to the use thereof. The old wet-plate hand is past redemption. I have had some experience of him, and have seen him in his lair (otherwise dark room), and I must say that a more dirty, slipshod, unmethodical workman it would be difficult to find in any trade but this. I am not individualising; I speak of a body of men as I have found them, and any exceptions only prove the rule.

And, oh, the excuses of these old hands for bad work or for no work! They ring changes on various things going wrong. First it is the bath; and, when a new one is made up, and equally goes wrong, it "must be the silver." They will even impeach such a standard article as Mawson's collodion, whilst, amongst minor troubles, there is the developer, the cyanide solution, and the intensifier. The mirror gives a safe excuse always, because it is prone to be out of order; yet I have used this article, when the silver had worn off, until it was as full of holes as a sieve. The lens, camera, screen, and electric light, if not "out of order," are at least condemned as unsuitable. Where there are so many employers in the business who do not thoroughly understand the routine of the work, the "old wet-plate hand" easily manages to find a situation. Of course he has no chance in the best houses, where there is careful supervision. One large employer takes the trouble to prepare the silver baths himself for all his operators.

For my own part, I have not found the wet-plate bath to be the bugbear it is to some people. I make it carefully, to begin with, exactly to weight and measure, exercising scrupulous cleanliness. The strength is kept up by occasional argentometer tests—thirty-five grains to the ounce for line work, forty grains per ounce for half-

tone. The bath-holder is light-tight, and the mouth is covered as soon as the plate is taken out. When out of use, a screw-down lid is put on. In this way, with occasional filtering, the bath works well for months; trouble only comes when it gets charged with iodine, ether, and alcohol from the plate, but then it is easy to drive these off by evaporation, and add new solution, so that a fresh career of usefulness is entered upon.

Returning to the subject of dry plates, let me point out that any one who wants to succeed with them must adopt dry-plate methods. The dark room must be thoroughly overhauled for any light leakage. The window or lamp must be tested for dry plates. A new outfit of dishes and measures will probably be required, judging by the usual state of those in most wet-plate dark rooms. Next, the dark slide should be thoroughly overhauled, cleaned free from dust and silver drippings, and reblacked. The camera likewise should be looked to, and will probably require reblacking, for dry plates are very susceptible to fog from apparently trivial causes like these. It is also a good plan to shield the lens with a conical tube blacked inside, and fitting on to the hood. Trials should be made to find the correct exposure for the plates to be used, and all exposures carefully timed by this. Finally adopt a good standard developer, suited as far as possible to the plate. Do not try modern developers with fancy names. If you have been used to pyro-soda, stick to that; if to hydroquinone, there is no need to change. Either of these will give right results. Of course the formula should be one calculated to give greatest clearness. It is a point to remember that the exposure should be full, and the lighting of the subject is important. With a good studio light or with a pair of arc lamps all will go well. No amount of exposure seems to compensate for a poor light in process copying. A single arc lamp is troublesome enough with wet plates; with dry plates it is worse. The part of the picture furthest away from the lamp will always show a distinct difference in density on the negative. One may sometimes dodge the matter by shifting the lamp over to the other side after half the exposure. The fixing, washing, and drying of the plates are important considerations. The hypo will give no trouble if it is used strong and fresh. A constantly running syphon washing trough should be fixed up beside the sink for washing, and operations can generally be so arranged that each negative gets a fair amount of time in this trough. As the negatives are generally used at once and done with, five minutes' washing will generally suffice. For drying I found it a good plan to fix a V-shaped rack high up in the dark room, above the level of the gas bracket. Thus the plates drained and dried simultaneously in the warm air accumulated at the top of the dark room. For quicker drying recourse may be had to methylated spirit. Probably a drying closet could be arranged where work was being done on a large scale, but by the methods I have described there was never any difficulty in keeping pace with collodion when all operations were taken into account. The working time would run somewhat as follows approximately for the two processes:—

	Wet Plate. Mins.	Dry Plate. Mins.
Preparing glass, coating, and sensitising ..	10	..
Exposure ..... say	7	5
Developing and fixing.....	5	10
Washing	5	10
Intensifying	5	..
Drying	3	10
	35	35

An important point for consideration is, comparative cost of the two processes. This is somewhat difficult to arrive at in case of collodion, though there can be no doubt, where things go smoothly, collodion is cheapest. But, as a matter of fact, in ordinary commercial routine, things do not go smoothly with wet-plate work, and I am inclined to think that, if cost were estimated on a year's turnover, the advantage would be decidedly in favour of dry plates. It is a pity that dry-plate makers do not seem to care to meet the needs of photo-mechanical workers. Certainly no plate yet introduced has fully realised the proper requirements. That a suitable photo-mechanical plate can be produced, and cheaply, is beyond doubt, for I know of a worker who has made his own, and I have had the opportunity of trying some of them which had been kept a year, the results being all that could be desired. American manufacturers are very much ahead of ours, two or three very good makes being on the market—both ordinary and stripping kinds.

Speaking of stripping for the reversal of negatives, it is a noteworthy fact that the American worker hardly ever thinks of using a mirror or prism, all his plates being stripped and the films turned. I believe, however, it is merely a matter of use, and probably brought about by a difficulty in obtaining good mirrors and prisms. Any way, American operators, when they come over here, take very kindly to the use of the mirror.

In concluding this subject of dry plates, let me say that I do not care to recommend any particular make of plate, where all are more or less unsuitable. Success with any plate will depend largely on the skill of individual workers. I have had the most satisfactory results from plates which were not labelled "photo-mechanical."

There can be no doubt that it is a decided advantage to use dry plates, for half-tone work especially. Besides getting uniformity and perfect cleanliness, the well-known spreading action of gelatine plates helps the process of hatching the grain. The best blocks now turned out are those in which the dots on the negative spread themselves in the high lights until they touch each other, leaving a transparent space between which forms the fine high-light dot on the zinc.

WM. GAMBLE.

COMBINED TONING AND FIXING BATHS.

[Anthony's Bulletin.]

THAT there still exists a strong prejudice in many minds against the use of a combined bath for the toning and fixing of emulsion printing-out papers is conceded; but it would seem that the prejudice is really founded on faulty manipulation, not upon actual crucial test. Over-toning, forcing with much-used solutions, too much or too little washing—all are factors in the production of prints of but little stability. With proper treatment, prints may be toned and fixed in one operation, and permanent results obtained. We have in our possession hundreds of such prints, which have stood every possible test, including that of time. They are to-day the equal of any prints, the toning and fixing of which have been done separately. With the combined bath there is one great advantage apart from the saving of time and labour; the desired tone once obtained, it remains, if washing immediately follows. With the separate fixing bath a change of tone always occurs, and considerable judgment is necessary to determine the moment when the toning should be stopped.

To the amateur the combined bath appeals especially strongly because of its simplicity. The solution is always handy, and one or two prints may be toned and fixed without any waste of material. Where large batches of uniformly toned prints are required, as with the professional, the separate baths may be preferable, though with a slow-working combined bath and previous partial fixation no real objection can be found. For the amateur, the combined bath is, and will remain, the favourite.

It has been stated in some quarters, where gelatine and other papers were vainly endeavouring to secure a footing, that collodio-chloride emulsion papers were not well adapted for use with combined baths. It becomes more apparent daily that professional photographers cannot with satisfaction to themselves use gelatino-chloride papers, and, as is but natural, amateurs are realising that collodion is far preferable to the impressionable gelatine. A few remarks on the method to be employed may be found useful.

To those who desire to make absolutely certain that the prints are thoroughly fixed, we would advise the adoption of Dr. Mitchell's plan of immersing each print in a solution of hypo of about one to twenty for three or four minutes, before placing in the combined bath. This is not absolutely necessary when a properly made-up bath is used, but we recommend it as removing one of the factors of instability. For the combined bath the following solution may be made up:—

Hypo	3 ounces.
Nitrate of lead.....	60 grains.
Chloride of gold	6 „
Water	24 ounces.

Dissolve the hypo, then add nitrate of lead dissolved in a little warm water; to this add the gold. Shake well and filter.

If eight ounces of alcohol be added to this bath, no previous manipulation is required; if the alcohol is not used, only the flattening process is necessary, without the additional first washings.

This will keep well and may be used until about one-third has been removed through absorption by the paper. Do not attempt to patch up an old bath. Any precipitated matter should be removed by decantation or by filtration.

The prints are placed in this bath one at a time, one hand being kept dry, the other pressing the print under the solution. Lay the print first face downwards, and then turn it over. Care is necessary that none of the solution touches the print until the moment of immersion, or yellow

patches will inevitably result. The prints are turned over occasionally, the bottom one each time being brought to the surface. It will be found best to remove the print just before the desired tone is reached, for a very slight change takes place in the washing water, due to the action of the toning solution retained in the paper. Tie a piece of muslin over the faucet, to catch any solid matter detached from the pipes. Do not omit this, or black specks may appear, which greatly mar the print. Do not tone to a slaty blue colour; do not use an exhausted bath; do not wash for twelve hours or more; do not underprint; have clean hands, free from perspiration; use mounts made by a reputable firm, and do not stack the prints one on top of the other to dry. The appearance of white specks after drying may be traced to the very slow drying of the mounted print, due to lack of a good current of air. If a large number of prints are to be dried, they should be spread out on cheese-cloth stretchers. Allow the prints to thoroughly dry before burnishing.

SOLIO PRINTS BY DEVELOPMENT.

The Eastman Company announce that, after a somewhat extensive series of experiment, they have perfected a simple and practical quick printing method with Solio whereby only $\frac{1}{10}$th to $\frac{1}{20}$th the ordinary exposure in the printing frame is required, thereby eliminating the annoyance which dark days cause the photographer. In addition to rendering him practically independent of the weather, it obviates the necessity of much of the exactness now required in printing, inasmuch as it is no longer necessary to print to an exact shade to get the best results, prints by the new process given 1-5, 1-10, or 1-20 the usual exposure coming out of the developer exactly alike, the shorter exposed being simply developed longer in the same bath. The following is the formula:—

Print $\frac{1}{4}$th to $\frac{1}{20}$th the depth required for the regular toning process The print ought to show faint detail in all but high lights. Immerse the dry print directly in the developer until print shows all the detail and about half the strength required in a finished print; this will take ten to thirty minutes.

Solution No. 1.

Hydroquinone	½	ounce (av.)
Sulphite soda	½	,, ,,
Potassium bromide	1	,, ,,
Ammonium bromide	2	,, ,,
Water	64	,, (½ gal.)

Solution No. 2.

Caustic soda	¼	ounce (av).
Water	16	,, (1 pint).

Solution No 3.

Tannic acid	8 grains.
Water	1 ounce.

To develop ten or twelve prints take

No. 1	5 ounces.
No. 2	1 ounce.
No. 3	1 drachm.

The print will, when first put into the developer, fade away to a pale yellow, then will slowly develop up to a point showing about as much detail and about one-half the strength as a finished print, remaining yellow, however. If the developer works too fast, dilute with water.

As fast as developed, throw prints into a solution of acetic acid three drachms per gallon of water.

Wash five minutes in frequent changes of running water; then tone in combined bath as usual. No extra fixing.

A little extra care should be exercised in putting Solio intended for development into the printing frames and taking it therefrom. It should be done by subdued daylight.

If the prints continue to develop in the toning bath, too much alkali (solution No. 2) has been used in the developer. The prints will appear to strengthen by reason of the change of colour in toning, but they ought not to increase in detail.

The exact point to which the printing is carried does not seem to make very much difference; so long as the print is under-printed, it can be brought up by the developer.

Development is best done by ordinary lamplight without a yellow shade.

Prints made by the above process are rather more brilliant than those fully printed out.

More sulphite in No. 1 tends to make softer prints.

Solution No. 3 requires a drop of carbolic acid if it is desired to keep indefinitely. The tannic acid is used only to harden the gelatine.

MR. FALL'S "EXPERIENCES."

At the Central Photographic Club, on April 6, Mr. Robert Beckett in the chair, Mr. Thomas Fall delighted his audience with *Photographic Experiences*. He said he had been associated with photography forty years. Previously he had taken up one of the sister arts. When Daguerreotypes were brought out, his attention was attracted by them, and he considered nothing more charming had since been produced. They were followed by the old glass positive, and very delightful pictures were obtained by that means. In the collodion days dry-plate processes existed, various preservatives being used to attain that end. First of all, there was the total abstainers' process, in which coffee was used. That was followed closely by the beer process, which was soon abandoned for malt. The great difficulty was to get rapidity. "A friend of mine took some plates at this time to Queensland, but, being unable to use them for two years, they were put by. When they were exposed, they turned out well.

"The collodion process had a very long innings, and it was by its means that photography became popular. In the early days photographers were noticed by the best people in the land, and were invited to visit the castles of the dukes and others. I remember one delightful excursion I had to the Isles of Skye and Arran, where I found the exposures were one-third more rapid than at home. I tried while there to photograph an eagle, which had been captured and secured to the top of a crag by a rope. I have found eagles are the most difficult birds to photograph. A heron which I had shot was thrown to the eagle. At first the excitement of the bird was something marvellous, but after a while it became quieter, and an exposure was secured.

"Soon after this I met my first amateur photographer. He was a Church of England clergyman, and did some very fine work up to 15 × 12. He was a born artist, and an enthusiast, knowing every process in existence.

"One experience I had of this period when using two dark rooms. When negatives were developed in one room they came up as fully exposed, and in the other as if under-exposed. The secret was, one admitted a little light, which slightly fogged the negative, and acted as a supplementary exposure.

"I have never taken kindly to dry plates, and still mourn the decay of collodion and the silver bath. The introduction of dry plates was the cause of the downfall of many successful businesses in connexion with photography. Some people, in starting photography, have considered the studio of one particular man to be all that was desired, and took no account of the skill and ability displayed by the men working in it, or of the fitness or suitability of it in their proposed site. I remember one man who invented a studio which he used in a back yard. It was suited to the locality. A large firm of photographers pulled down a large and beautiful studio, and got hold of this man to build one according to his pattern and under his guidance. It was found to be unsuitable in that position, and had to be pulled down. In advising an amateur in building a studio to take portraits of his friends, I should certainly recommend a high front light."

The lecturer intimated his willingness to advise any members of the Club who were about building studios. "The husband of one of the Royal Princesses has a long and short side of the face. He is best looking on the short side. Just before his marriage I took some negatives of him. Other photographers to whom he sat took the long side of the face, and in every instance the pictures were disapproved. Never use high front light for these sitters. In taking large heads, where there are deep shadows under the eyes, it is desirable to place a newspaper on the table in front of the sitter; it lights up the eyes and helps amazingly. I show an example. Experience has taught me that it is necessary to have two newspapers—one Radical and one Conservative—as a photographer must not, above all people, allow politics to interfere with business. Snapshots win medals, but medal-hunters do not always turn out the best work. These people know where the actresses and their models live when they are required. In many cases three-fourths of the credit should go to the models, and one-fourth to the photographer. The great test of capacity is with a set of ordinary sitters, and to turn out pleasing work. I remember Mary Anderson sat for two days to one man, and she rejected nearly all of the negatives. Three or four were successful, and, when they were published, that man passed as a great photographer. It is a mistake to allow aged persons to assume attitudes which are not natural. They want to sit upright; they don't do it at home. Always get the bend or stoop. I took a profile portrait of Gustave Doré, instead of the full-face portraits which he had previously had. He was very pleased with the result. Rembrandt effects are very flattering and pleasing, and have often led to business.

"I have been accused of running down the amateur. I must stand against that, as it is a thing I have not done. There are amateurs and amateurs. These young people with a little learning are the sort of people who do the professional most harm. An injudicious amateur does a great deal of injury, and he will often run in and deprive a professional of work." [The lecturer gave point to his remarks on this point by two instances which happened to himself, one being a bridal party, where the result was absolute failure.] "Retouching is a curse. Our public men are being handed down to posterity looking like fools more than anything else. All the lines and undulations have been taken out. I have been looking over some prints made before the days of retouching, which I have brought

with me. Photographers should do their own retouching, and they ought to have a knowledge of the anatomy of the face, and while at work should have a print before them. I think the public would be satisfied with a negative if the shadows were simply softened here and there where they are hard; that is legitimate. I never talk about formulæ, but leave that to the chemist. I modify the maker's formula to suit the studies. Ammonia has been very useful in the developer in its day. For beautiful soft negatives, soda is the best, but it takes a little longer to develop. Negatives can be produced with it which will print either in platinum or solio. Some contend it is impracticable. Better value can be got out of a grey negative, there is more approximation to collodion. The theorist is not the best man for the studio; the most successful man is one with artistic feeling and who turns out pretty pictures which the public like.

"There is business to be done in London and elsewhere by men who will keep up with the times. Negatives should be made good, proper, and well built up at the time, and not trust to the retoucher. One evening I was dining out in Gower-street with a medical man and his family. Among the persons present was a very lively gentleman, eighty years of age. He was an old photographer named Newcombe, who had had studios in London. We got into conversation, and he said he and a friend took the first photograph in London. It came about in this way, e said: "Daguerre wrote a letter to a friend in England, giving a full description of the camera, formula, &c., necessary. The letter could not be delivered owing to the insufficiency of the address, and was therefore returned to the Dead-letter Office. My friend, who was in the office, made a copy of it. We set to work and made a camera, and took a photograph." Mr. Newcombe became very much interested in the art, and afterwards turned out good work."

At the conclusion of his lecture, Mr. Fall exhibited a number of 12 × 10 waxed-paper negatives, and a number of collodion negatives, and also a considerable quantity of prints illustrating various points in his remarks.

ENLARGING AND THE PRODUCTION OF NEGATIVES FOR CARBON PRINTING.

Before the Edinburgh Photographic Society on April 4, Mr. M. Muir Scott read a paper on *Enlarging and the Production of Negatives for Carbon Printing*. In the opening he said that the subject, although an old one, might not be without interest for those who had taken up photography since the introduction of dry gelatino-bromide plates, as to them the working of the wet-plate process was hardly known, and by professional photographers who did know it seldom worked. Regarding wet-plate work, the silver bath and the chemicals necessary for working with it are almost essential to the enlarging process, and the different methods employed for producing a good printing negative for carbon work will be gone into in full detail.

Carbon work is well known to the profession, and nothing can be said too highly in its praise, as the results obtained are of the utmost beauty, although the labour may be greater than in many other processes.

Although not wishing to pose as an authority, everything stated will be result of personal experience, and may help to overcome difficulties which had to be contended with. In dealing with enlarging, it is well to bear in mind that cleanliness is of the first importance, and, secondly, that nothing is so essential as attention to what at first sight may appear as minor details. In nothing can this be more forcibly impressed upon the worker than in the matter of formulæ. If the object to be attained is a perfect result, these matters must have strict attention.

Do not allow yourselves to be led into the fatal mistake that this or that is only mere detail; it is the neglect of these minor matters, as they may appear to many at first sight, that are so often the cause of useless waste, needless trouble, loss of time, and, what is worse, loss of temper and good material. In the matter of formulæ see that you have all the chemicals at hand that you require; be particular that they are in good condition; do not guess at quantities, but measure and weigh every ingredient, and mix as directed. If these rules are borne in mind, many of the difficulties which come cropping up disappear, and work is a pleasure instead of a continual worry.

Let us look at the original from which our enlargement is to be made. If from a print, decide as to the best method to employ, whether to enlarge direct, or take a small negative first. If the print is in good condition, it may be possible to enlarge direct to the size wanted by means of the reversing mirror; but, if the print be in poor condition, the best method will be to enlarge to some intermediate size, finish this intermediate negative in the best possible way, then, by means of a transparency from this, enlarge to the size required.

In explaining the use of the reversing mirror, Mr. Scott said it might be used either in front of or immediately behind the lens, the angle of forty-five degrees being essential to its use. Used in front, the camera is placed parallel with the object to be photographed, the image reflected on and copied from it; but, if in the other direction, the camera is still kept parallel to the copy, and the image reflected upon the plate from the mirror being placed at a right angle to it. His own practice and liking was to use the lens in front of the mirror, the camera requiring less extension, and there being less chance of stray light reaching the plate.

The mirror itself is a very delicate and expensive instrument, requiring very careful handling. It is manufactured upon glass, ground and polished, optically corrected, and silvered on the front, and again polished. The slightest touch, even from a dusting brush, will scratch the surface, and, although a few scratches will not materially affect the working of it, still it is better if perfect. For copying it is invaluable for carbon or for any of the mechanical processes. Instead of a print, suppose the subject to be an original negative. Examine it carefully before the transparency is printed from it, as it is of the utmost importance to get the very best possible from the negative at this stage, and this leads to the production of transparencies. There are several ways by which they may be made, and while taking them in detail, he would endeavour to show which practical experience leads to believe the best, as being most practically useful.

First is the dry plate; second, wet plate; third, carbon; and, lastly, the method of making the transparency the size of the enlargement, and then making the negative by contact. Which is best? Opinions in this, as in other things, differ, but he should say the carbon transparency is the most generally useful. It will stand enlargement better than any of the others, without being helped by intermediate manipulation, such as retouching, &c. It lends itself to the process of enlarging best by giving the greatest amount of delicacy in the finer detail and half-tones without sacrifice of the other parts, provided a little time and trouble are devoted to the production—a matter which requires careful judgment and intimate knowledge of the different printing qualities of negatives, along with a practical knowledge of the requirements of carbon printing.

It is barely possible to emphasise too strongly the importance of getting from your original negative all that is in it, and that again into the transparency before risking an enlarged negative. This having been secured, it becomes a comparatively easy matter to obtain a good enlarged negative; a failure in this particular point, and no after-doctoring can compensate it.

Contact transparencies by gelatine dry plates are not so satisfactory for general purposes, principally from the fact that the true relative values of light and shade are not got so well as by carbon; the deepest shadows showing greatest want of detail. In using them the oxalate developer is much the best, the chance of clogging the deeper shadows being least by its use. In wet-plate transparencies greater care must be given to true time of exposure, as under-exposure always shows, when enlarged, a loss of the finer half-tones, but under-development, or too strong a fixing bath, will give practically the same result; but, commercially, as it takes little time, it has a high value for enlarging purposes. In making transparencies the full size of the enlargement, the wet process must be used, the principal drawback being the expense and the care and judgment in making the negative for carbon printing, and is not often resorted to save where expense is no object, and it gives results by contact printing which no other does. The transparency can also be helped in many ways, in some cases making the enlarged copy better than the original negative, the enlarged negative being also capable of further improvement. (An example by Mr. A. Inglis of the interior of the Empire Theatre, done by this method, was handed round and much admired.) In making transparencies, those in carbon seldom require intensification, but wet-plate ones occasionally do, and the best agent for that is permanganate of potash; those on dry plates can be treated precisely as negatives are, if a little density is needed.

After a few words in favour of wet plates, both for landscape and portraiture, and their greater adaptability for enlarging, as well as for many other qualities, and a strong recommendation to all to varnish their dry-plate negatives for preservation in our variable climate, the preparation of carbon transparencies was entered upon, for which purpose patent plate-glass was put as essential, and equally so the perfect cleanliness of it, after which it must be coated with a solution of gelatine and bichromate of potash. Nelson's No. 1 gelatine, three-quarters of an ounce; swell it in a pint of water, and then dissolve by gently heating and stirring, then add as much bichromate in solution as will make it a golden colour, and filter it before use in coating plates; set up to dry, and when dry expose to strong daylight, allowing the plates to stand a full day before use. They are then ready to receive the exposed tissue, the substratum having been thus rendered insoluble. Much judgment is needed with the transparency tissue to fit it for negatives of varying density; but from one part bichromate in fifteen to one in twenty of water will be found most suitable for the bichromate bath for sensitising, with a small quantity of ammonia in addition, to render the tissue more sensitive. This bath should be kept from light and filtered before use, and in the use of it great care should be exercised, making use of rubber finger-stalls or gloves, to prevent absorption into the skin, which is the cause of painful wounds.

The apparatus necessary in preparation of the tissue are a dish large enough for the largest size, a plate-glass or zinc plate for squeegeeing upon to remove superfluous bichromate, the squeegee itself and some American clips.

In sensitising the tissue it should be immersed and all air bubbles carefully removed with a broad camel's-hair brush, three minutes being sufficient for each sheet.

The sheet of glass for squeegeeing upon must be thoroughly cleaned

and afterwards polished with dry French chalk and coated with uniodised enamel collodion, and washed under the tap till greasiness disappears. The limp sensitised and printed tissue is then squeegeed upon it face down, and all air specks or bubbles got rid of, and dried in a warm, dark place. When dry it is stripped from the plate and cut to sizes.

With both negative and transparency a safe edge must be used of either yellow or black paper or black varnish of about half an inch or so; this ensures safety in the after-washings.

All prints in pigment must be printed with the aid of the actinometer, each negative or transparency, or lot of the same density, being tested and marked. Mr. Scott showed and described the use and working of several of these, and gave also warning not to over-print or keep tissue prints too long undeveloped, the continuating action of the light tending to deepen or render it insensitive. After damping and getting limp the printed tissue and drying it as described, the zinc or glass plate with print attached is developed, by placing it in a bath with water about blood heat, and after a short time the back paper will leave the image easily. The heat is now increased and all the soluble gelatine washed away. After a rinse with cold water it is transferred to the alum bath, composed of one pound of alum to two gallons of water. A porcelain or slate dish is best for this, but on no account use tin or iron dishes for the alum bath. It also removes all colour from the protecting coat of collodion and gelatine, which may be left in the gelatine first coating.

Enlarged negatives for single transfer in carbon must be reversed ones, and we may, according to taste, employ either dry or wet plates. If the enlargement is to a great extent, wet plates are most convenient, and they are most economical, 'giving what is essential in large pictures, great vigour. After thorough cleaning the plate is albumenised of the strength of white of one egg to thirty of water, with from fifteen to twenty drops pure ammonia, well beaten and before use filtered; dry quickly. This prevents collodion leaving glass during after-stages. The silver bath, its preparation and care while in and out of use, was then described with this sage remark added: "There seems a fatality connected with some people. They never touch a bath but it goes wrong, while with others it never seems to alter, always remaining good till all the good is taken out of it. Then put aside, strengthened, and made again ready for use.

"This bath is made up of nitrate of silver and distilled water, thirty-five grains to the ounce of water; and in winter it is well to keep it at forty grains, slightly acidified with nitric acid. When quite new, a plate left in it adds the needful amount of iodine. One of the secrets of keeping a silver bath right is always to keep it at an even temperature and never interfere with it if working right, and in extensive work it is well always to have a spare bath in readiness. Baths sometimes go wrong without a moment's warning or apparent cause. I have seen a perfect plate taken in ordinary working and the next quite opaque with fog." Mr. Scott then fully detailed how to doctor a faulty bath caused by any of the numerous chances to which such a delicate body is subject.

The collodion was next in hand, fully ripened being that recommended, and for developer that found best for enlarging purposes is the usual fifteen grains protosulphate of iron, eight to ten drops acetic acid, with about one to two grains sulphate of copper and a small proportion of methylated spirit to make it run easily. This, like the collodion, improves with keeping, and should be made up in bulk, so as to be always handy, but kept at concentrated strength and diluted when wanted.

Intensification of negatives, which is generally necessary, may be done with several agents, and is generally best carried out before fixing, there being thus less liability to stain. This is correct both with iron and pyro, thorough washing between each stage being the only necessity, and with mercurial intensification this must be after fixing, and both before and after the washing must be copious and thorough. All wet plates are better to be fixed in a medium strength of cyanide of potassium, which when well fixed washes away much easier than hyposulphite of soda. For large plates the flat well bath, with corrugated glass bottom, is used, containing many gallons of sensitiser. In development, as soon as the deepest shadows show a covering of deposited silver, it should then be at once washed off, and if properly toned the result is so far perfect. If a little under-exposed, a slightly stronger developer helps to save a plate; but, if quite under-exposed, nothing will or should save it from the wash-tub. Over-exposure makes the image flash out at once, and the picture is flat; but this may sometimes be cured in the after-intensification, but it is not safe to trust to that.

Much can be done with enlarged negatives to improve them. Such as, if the original negative be under-exposed, it should be fully exposed, and so reduce the contrasts as far as possible; and then, by means of matt varnish, touching and scraping out the lights before printing, a better result is got. If over-exposed, the reverse process is used, the enlargement is slightly under-exposed, and by that means the enlargement a little more contrast is got. When the printing comes on, the enlarged negatives can also be improved in many ways to give a better and more equal result in the print.

Negatives for carbon work, more especially since the introduction of the rapid-printing tissue, require greater density than for silver or platinum printing, and all are varnished before use.

In printing, it is the practice to rub all negatives over with French chalk before printing them in carbon, in case any latent or accidental damp may cause adhesion; and, in practice, the box printing frame, with an unhinged back, is the best, the actinometer giving the necessary exposure.

Minute details as to, and many wrinkles in, carbon printing were explained—one of them, on the cure of frothy bubbles which sometimes appear in developing a print in the hot water, and on the print. A piece of white soap passed over the fingers and hand causes them to disappear at once.

Transference of the developed print to its final support of paper, ivory, opal, glass, and drawing paper for artistic effects were fully gone into, all of which were explained as from single-transfer reversed negatives, but the method of double transfer were also as lucidly explained.

The conclusion of the paper and exposition was devoted to the use of the optical lantern, and of these the speaker gave the preference to Hume's "Cantiliver," and that it has worked so satisfactorily for two years that it could not now be done without, especially in the winter. It is worked up to twenty-six inches, and the oxy-hydrogen light is that made use of. Results quite equal to daylight are got, as may be seen from the many examples before the Society, and as regards comparison with daylight for time, and, after mastering the methods, for quality also, the artificial light, being more steady and constant, has rather the best of it. The profession is greatly indebted to Mr. Hume for this admirable piece of apparatus, which he has placed in their hands as a means of helping them in times of distress and dull weather.

ROTHERHAM PHOTOGRAPHIC EXHIBITION.

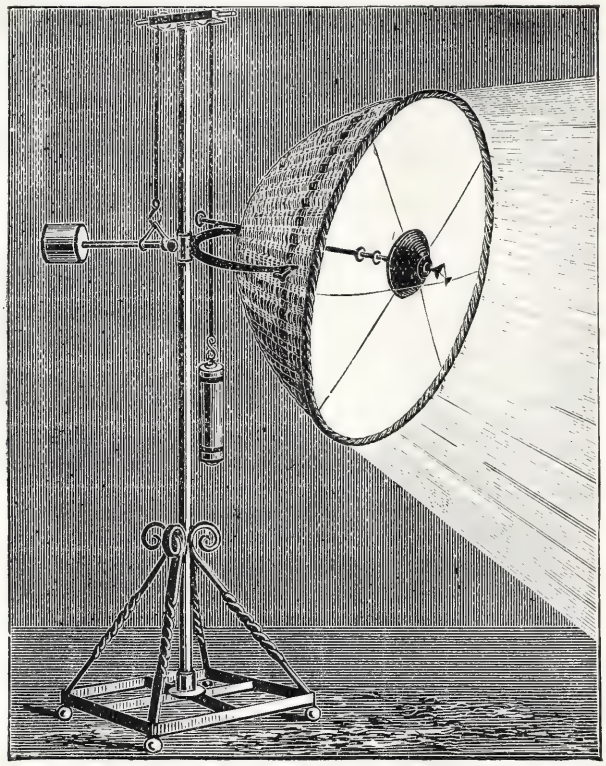
The fifth annual exhibition of this society, held in St. George's Hall, Rotherham, on Tuesday and Wednesday, April 3 and 4, proved highly successful. The work of the members was considerably in advance of last year's, and was largely composed of half-plate prints in platinotype, bromide, platino-bromide and gelatino-chloride (matt and glossy). Albumenised silver and carbon were not represented. There was no striving after awards, the committee having decided that the display should be non-competitive in its character. The photographs had, however, been carefully gone through before-hand, the committee having had the assistance of Mr. G. A. Illston, headmaster of the Rotherham School of Science and Art, with the best results. Altogether there were over 400 prints (including loan collections), the section almost wholly unrepresented being that for portraiture. The suitable display of the work was early completed and catalogued, and the whole arrangements were well spoken of by visitors. The opening ceremony was performed by Miss B. Chambers, of Clough House, in the presence of a fairly large gathering. Mr. E. Isle Hubbard, M.S.A., in the unavoidable absence of the president (Mr. F. B. J. Baldwin, M.R.C.S.,) occupied the chair. The society was fortunate in having a distinguished list of patrons and patronesses, several of whom attended. The company also included Lady Charlotte Fitzwilliam, the Hon. Mable Fitzwilliam, the Hon. Theresa Fitzwilliam, Mr. G. W. Chambers, J.P., D.L., and Mrs. Chambers, Miss Mahon, Mr. R. Dyson, J.P., Rev. W. R. Pym, M.A., Vicar of Rotherham, and Councillor I. Walker (chairman of the School of Science and Art). Regarding the exhibitors, the best were as under:—Hon Members: Lady Alfreda Fitzwilliam, Miss M. L. Egerton, and Miss M. Crossley. Members: Dr. F. B. J. Baldwin (President), Messrs. J. W. Baker, F. H Barraclough, J. Caseldine, Rd. Chrimes, J. Clarke, A. Feirns, W. Firth, H. C. Hemmingway (Hon. Sec.), E. I. Hubbard (Vice-President), James Leadbeater, A. S. Lyth, W. Mason, G. T. M. Rackstraw (Vice-President), and W. Sheppard (Hon. Financial Secretary). Loan Collections: The Autotype Co., London (20 reproductions); Mr. R. Keene, Derby (16 landscapes and interiors); Mr. T. Scotton, Derby (6 large pictures—3 architectural—and 1 frame of views; Messrs. Perken, Son, & Rayment, "Optimus," London (1892 and 1893 competition prints and enlargements); Eastman Photographic Materials Co., London (prints and enlargements); Messrs. R. and J. Beck, London (Frena enlargements); Messrs. R. W. Thomas & Co., London (prints from Sandell negatives); Mr. J. Leadbeater, Rotherham (enlargements of frost on window pane, and local views); and Mr. J. H. Payne, Mexbro' (collotypes). The optical lantern was brought into use each evening, slides being put through on Tuesday, and a series of slides by members on Wednesday. There were also special musical programmes. The attendances were good.

HOUGHTON'S ELECTRIC LIGHTING APPARATUS.

Messrs. G. Houghton & Son, of 89 High Holborn, have recently introduced an apparatus for the utilisation of the electric light in studio work which has many features to recommend it. Perhaps its main advantage is that it is portable and self-contained, and can thus be moved to any part of the studio at will. The reflector, as will be seen from its construction, has universality and ease of adjustment, can be easily raised

lowered, or placed at any desired angle, so that a large variety of lighting effects are obtainable.

The inner surface of the reflector (or radiator) is of a light tint, and its outer casing consists of basket work. The lamp is a hand-feed one, and the arc is struck by tightening a cord which crosses the outer diameter,



and the carbons also allow of outside adjustment. Power as supplied from the mains is utilisable, and the light is of such an intensity as to allow of the shortest exposures. Messrs. Houghton say: "The reflector lamp was designed in the first place for the use of photographers; but by slight modifications it can be adapted to various other requirements. It could with advantage be applied to the lighting of artistes, groups, and scenery on the stages of theatres; to the throwing of a direct light on successive pictures and works of art on ceilings and walls of picture galleries," &c.

Its price is 25*l.*, and we should think many photographers would soon recover its original cost now that there is such a call for electric light in portraiture and group work. Messrs. Houghton supply for use with the reflector a portable and easily movable screen, supported by rods on a light frame, which packs away into a small space, if so desired.

THE HOLBORN CONTINUOUS FLASH LAMP.

The leading points in this flash lamp, the introduction also of Messrs. Houghton, are these:—

The magnesium powder is contained in the cone-shaped part of the



amp, and when the ball is squeezed it passes upwards through the small tube shown by the dotted line into the flame. By a simple arrangement, only a small quantity of powder can pass through the flame at one time, thus giving a continuous and steady light as long as the powder in the reservoir lasts.

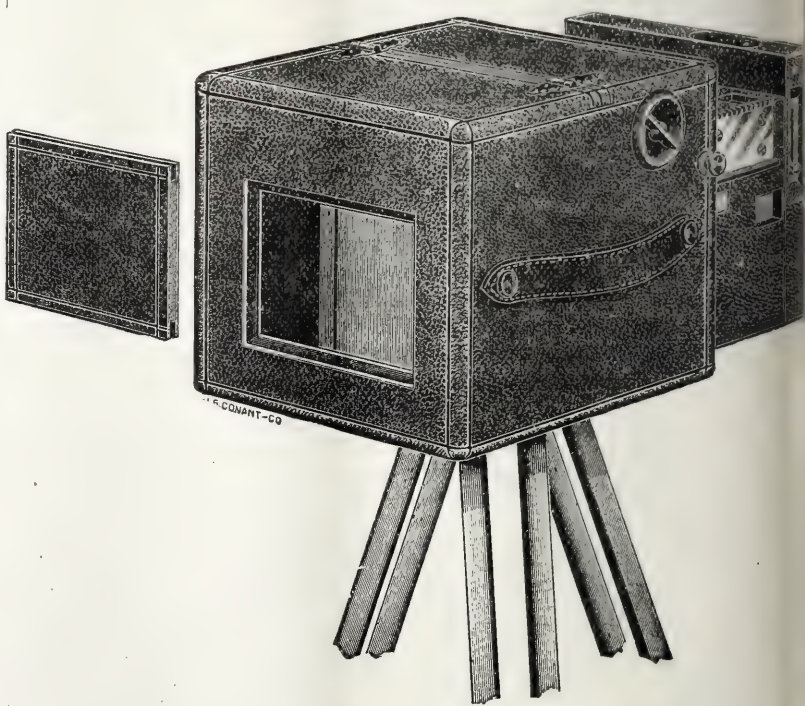
The lamp itself is very portable, and can be used for photographing, either in the studio or for large groups in ball-rooms, theatres, &c. It gives a light sufficiently powerful for most ordinary purposes. One of the principal obstacles to the growth in popularity of flash lamps is the objectionable fumes resulting from combustion. To avoid these, as well as to provide a simple means of diffusing the light, Messrs. Houghton have adopted the plan of enclosing the lamp in a large cylindrical glass vessel, covered with tissue paper, connecting with this a shaft, which conveys the fumes off through elbow-jointed metallic tubing. The whole arrangement appears an excellent one, and some such is necessary in the use of flash lamps.

Our Editorial Table.

Hawk-eye Cameras and Films.

No one can reasonably object to an invasion of this country by enterprising Americans provided they minister to our needs or comfort, or in any way conduce to our advantage. This is our idea after a perusal of an exceedingly well-printed catalogue of the European Blair Camera Company, embodying their novelties for 1894. This catalogue forms indeed an *édition de luxe*, being printed on stout, finely calendered paper, braced together with silken cords, and illustrated in that ornate style characteristic of our transatlantic friends when they want to show what they are capable of doing in typography. It is, however, the cameras themselves described therein which form the real attraction.

Since we gave a species of running commentary on some of them last year, certain new features, based upon European requirements, have been imported into their construction. We have had the privilege of carefully examining most, if not all, of the newest models, and can only express admiration of the various mechanical



adjuncts brought into play to conduce to their efficiency, conjoined as these are with simplicity of design. Of these we shall at present confine our remarks to the No. 1 Hawk-eye. This is made for 5×4 plates, and when closed up measures exactly $8 \times 6\frac{1}{2}$ inches, a small bulk when it is considered what the camera is capable of holding and doing, for when closed it contains either a roller slide or three double backs in addition to a celluloid focussing screen, lens, two finders, time and instantaneous shutter, graduated scale of distance, and other conveniences.

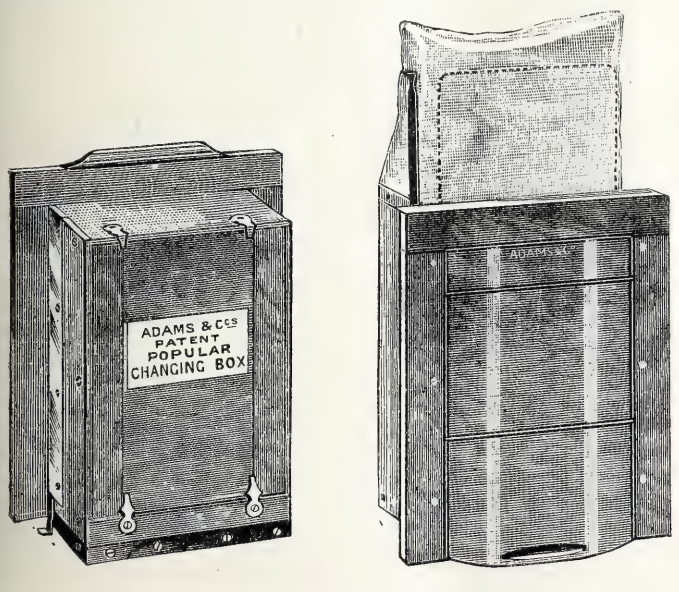
The camera is primarily a hand one, and when employed as such the services of the graduated scale situated near to one of the finders are had in requisition. But it is also intended for use on a stand, as shown in the cut, when the focussing screen ensures refined focussing. In this case the back cover is removed, and the image is capable of

being carefully examined at leisure. The focussing is effected by a knob at the side, actuating a rack and pinion, and the lens is so mounted as to be capable of being raised or lowered. The mechanism for the exposure quite "takes our fancy." After a discharge, a button is pushed to one side, when the shutter by this act is set, ready for next exposure. There are two exposure buttons; one gives an instantaneous exposure, the other being under control of the finger up to any desired number of seconds or minutes. The tension on the spring of the shutter may be varied at pleasure.

The slides, and indeed every part of this camera, being made by machinery, they are of course interchangeable. We understand that the mechanism is covered by several patents, but are uncertain as to their precise nature or scope. Be this as it may, the Hawk-eye just described is a singularly excellent instrument.

Adams & Co's Patent Popular Changing Box.

In the form of an ordinary dark slide, although somewhat thicker than usual (that now under examination being two inches thick), Messrs. Adams & Co., Charing Cross-road, have manufactured and placed on the market what is at one and the same time a dark slide, a reservoir for a dozen plates in sheaths, and a changing box. It is adaptable to every kind of camera of the size for which it is intended.



To load the reservoir, the back is opened, the sheathed plates are inserted *en bloc*, and the back closed again. This is all, and it can be done equally as well by feeling as by seeing. Hence, by using a changing bag, the dozen plates contained in the reservoir can be removed in open daylight, and a second dozen inserted—a valuable feature for one who wishes to travel with the minimum of *impedimenta*.

The plates in the reservoir are changed by the agency of a soft bag of Swede leather, which lies folded in a recess. On pulling up a brass handle, the foremost plate, which has been exposed, is drawn up into the bag and deftly transferred to the back of the whole, the second in the series having meantime taken the place of the first, and thus the rotation goes on until all have been exposed, when the rotation ceases, it being impossible to expose a plate a second time.

From the above cuts the configuration of this neat reservoir will be seen. In one the bag is folded down, in the other it is distended. It works with unerring certainty.

La Perspective en Photographie.

By Captain R. Colson. Paris: Gauthier Villars et Fils.

In this little work the author treats of the principles of perspective as applied to photography, chapters being devoted to geometrical perspective, and perspective with different kinds of objectives, &c. Other chapters treat of the application of the principles laid down, the influence of visibility on the details, and the relative value of tones on the effect of perspective, &c.

The Haverstock Manufacturing Company, 70, Chalk Farm-road, N.W., have sent us their catalogue of cameras, slides, lenses, and other photographic appliances.

We have received from Messrs. Cadett & Neall a "set" of the Cadett Velox Developer, for instantaneous work, by the use of which an enormous reduction in time of exposure is claimed. Not having yet completed our trials of it, we defer critical remarks till next week.

News and Notes.

On April 2, Mr. G. Frost, photographer, of Alton, Hants, photographed 120 babies (cabinet size) in five hours.

Central Photographic Club.—To-night (Friday), the 13th inst., Mr. A. Horsley Hinton will read a paper on *The Language of Photography*. Tickets can be obtained from the members or the Hon. Secretary.

The Crystal Palace Company have issued a pamphlet descriptive of the arrangements for the Handel Festival in June next. It has portraits of the principal artists well printed in collotype by Messrs. S. B. Bolas & Co., of 11, Ludgate-hill, E.C.

North Kent Amateur Photographic Society.—Owing to pressure of other work, Mr. G. W. Cobham has resigned the Secretaryship of this Society. He is succeeded by Mr. Thomas Winnett, of 5, The Grove, Gravesend, to whom all communications should be addressed. Mr. Cobham retains his seat on the Council.

The Patent Office Library.—The library is open free from ten a.m. to ten p.m. every week day, containing English, colonial, and foreign specifications and trade marks, text-books, periodicals, &c., in all branches of science, English and foreign. The number of readers during the week ending April 7, 1894, was 2396.

Messrs. Willis & Co., Limited, card and mount manufacturers, inform us that the lease of their old premises, where the firm has been established for sixty-five years, having fallen in, the place has been pulled down, so that they have recently removed into more extensive and commodious premises, situated at 92 Long-acre, Wilson-street, and Charles-street, W.C. These embrace the finishing factory, sampling department, and offices. The manufactory has been removed to Phœnix-place, Gray's Inn-road.

"An Evil Thing."—Professor Herkomer, R.A., has discovered that there is a "very evil thing" abroad. It looks beautiful in the shop windows; it is, as a matter of fact, extremely attractive in its way, but it is cheap, and it has taken the place of the artist. Its name—as he informed the members of the Incorporated Publishers' Association at their first anniversary dinner on Saturday evening—is photogravure. Once upon a time the illustrated papers depended almost entirely upon wood engraving for their pictures, now it is a case of "process," "process," and nothing but "process."

We understand that Mr. W. Low Sargeant, whose great photographic abilities and inventive and mechanical skill are known to, and appreciated by many of our readers, will shortly leave this country for Java, on account of ill health. Last week several members of the Photographic Section of the Croydon Microscopical Society, of which he has long been an esteemed and valuable member, presented him with a handsome gun, revolver, &c., as a mark of their appreciation. At the meeting where the presentation was made, Mr. Sargeant was the recipient of many good wishes, which he modestly acknowledged.

Messrs. Perken, Son, & Rayment, of Hatton-garden, London, had the honour of displaying their new safety saturator for optical lantern illumination before the members of the Royal Institution of Great Britain, in Albemarle-street, Piccadilly, on Friday evening last. The instrument was shown in a biunial lantern, one saturator supplying the two jets. The light was switched off and on from the upper to the lower lantern, and *vice versâ*, with great rapidity. Several members of the Company present themselves manipulated the instrument, and expressed their great satisfaction at the simplicity and perfect success of the dissolving arrangement. By way of experiment, one or two gentlemen tried to snap out the light, but were gratified to find it quite impossible so to do. The room was illuminated by brilliant electric lights during the time these experiments were conducted; still, the transparent photographs projected on the screen were well illuminated and much appreciated.

"Would not be Photographed."—Much interest has been aroused in legal circles in Spain by an appeal to the Supreme Tribunal brought by a notorious criminal named Ceferino Lopez, against a sentence of the Court of La Magdalena, Seville. Lopez, who has spent a large portion of his life in prison, is not only an accomplished swindler, but has also become well known in the Courts as an authority on Spanish penal law, having frequently succeeded by his perfect knowledge of the technicalities of the criminal code in escaping punishment for his offences. The Judge at La Magdalena recently ordered that a photograph of Lopez should be taken, but the prisoner refused to allow this to be done, and, after baffling every attempt of the officials to obtain his portrait, was sentenced to three months' extra imprisonment for disobeying an order of the Court. It is against this sentence that Lopez has appealed, maintaining that there is no law by which a refusal on the part of a prisoner to have his photograph taken is constituted a punishable offence.

The Three Kinds of Etching.—In the course of his lecture on *The Etching Revival* last week at the Royal Institution, Mr. Seymour Haden described the essentials of the three kinds of engraving as follows:—"If I take a steel tool called a burin, and, using a certain amount of force and a peculiar movement of the hand, plough lines in the surface of a bright copper plate which will hold ink, I have done all that is necessary to constitute line engraving. If I take a plate of bright copper or any other soft metal, and with a highly tempered steel bar, shaped like a fine cedar pencil and sharpened all round at one n

and triangularly pointed at the other, make lines upon the plate, that is 'dry-plate' engraving. If, having covered a bright copper plate with a varnish called grounding, I scratch away the varnish with an instrument called an 'etching needle,' so as to completely remove it in lines without more than scratching the plate underneath, and afterwards corrode out those lines by immersing the plate in a chemical liquid, I shall have done all that in principle is necessary to constitute etching. If I take a peculiar cutting tool, shaped something like a chisel mounted on a long bar running on a sort of railway, and called a 'rocker,' and rock this in all directions over the surface of a copper plate, so as to raise thereon a sort of pile, the surface will print quite black; but, by scraping away some of the pile, half-tints are obtained, together with other gradations of colour. This is essentially the process of mezzotint. If, instead of making a pile by a 'rocker,' I dust powdered resin or asphaltum over the plate, and apply sufficient heat to make the particles stick together on the plate, leaving minute interstices between, I shall have what is called an aquatint ground. Having done this, if I paint out a design on it with quick-drying varnish, and then immerse the whole in acid, so as to etch the exposed copper, the design in varnish will be the highest lights, and, by repeating the process for the deeper lights in succession, I shall have done something towards producing an aquatint."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
16	Camera Club	Testing Slides in the Studio.
16	Glasgow and West of Scotland	
16	Leeds Photo. Society	*Morocco and the Moors.* Dr. H. B. Hewetson.
16	North Middlesex	*Hints on Selection of Subject.* A. J. Golding.
16	Richmond	
16	South London	
17	Birmingham Photo. Society	
17	Brixton and Clapham	*A Cruise on the Norfolk Broads.* Mr. Bartrop.—Demonstration: *Intensification of Negatives.*
17	Derby	
17	Hackney	Lantern Night. *How Popular Periodicals are Produced.*
17	Hastings and St. Leonards	
17	North London	
17	Paisley	
17	West London	Technical Social Meeting. Discussion on Outings.
18	Brechin	
18	Bury	
18	Croydon Camera Club	*The Measurement of Exposure.* M. Maclean, F.C.S.
18	Leytonstone	
18	Manchester Camera Club	
18	Photographic Club	*Plate-changing Appliances.*
18	Southport	
18	Southsea	
19	Birmingham Photo. Society	
19	Camera Club	*The Correlation of the Mouths of Insects to the Mouths of Flowers.* Professor F. Cheshire.
19	Ealing	Exhibition.
19	Glossop Dale	
19	Greenock	
19	Hull	
19	Leeds Camera Club	Conclusion of Winter Session.
19	London and Provincial	
19	Oldham	
19	Oxford Photo. Society	
20	Cardiff	
20	Central Photographic Club	Lantern Evening.
20	Croydon Microscopical	
20	Holborn	
20	Leamington	
20	Maidstone	
20	North Kent	
21	Hull	
21	Leytonstone	St. Albans. Leader, A. E. Bailey. Trains from Moorgate-street (Midland Railway) at 1.11, 1.59, and 2.41.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

APRIL 10,—Ordinary Meeting,—the President (Sir H. Trueman Wood) in the chair.

Three new members were elected. The Barnsley Photographic Society, the Cromwell Camera Club, and the Swansea Amateur Photographic Association were admitted to affiliation.

POLARISATION APPLIED TO PHOTOGRAPHY.

Mr. BIRT ACRES read a paper on this subject. After touching on the principles of polarisation, he said that by utilising polarised light for photographic purposes, better photographs of oil paintings and many other objects could be obtained. Reflections from polished surfaces always produced defects of light and shade. In the case of machinery, to overcome this defect it was often covered with tallow or white lead. Briefly reviewing the nature of light, and the laws of reflection and refraction, and the polarising angles of various substances, Mr. Acres pointed out that a large portion of light, although polarised, produced no effect without being analysed. Nicol had employed the double refracting property of Iceland spar for the examination of polarised light. After describing the Nicol prism, Mr. Acres came to its practical application in photography. In taking a photograph of a shiny object, it would be found that the light would be in patches, and by employing a Nicol a better representation would be obtained. By revolving the prism a large portion of the objectionable light is totally reflected into the mount, the hard patches of light disappear, and the photograph would be a much more truthful portrayal of the original. Another method of analysing was by placing a mirror in front of the lens. This gave a reversed negative, which would be a boon for the single transfer carbon process. The reflector would be rotated round the lens so as to suit various circumstances. The black glass had been successfully used for cirrus clouds and foliage. A silvered mirror would not do. He had employed the Nicol in conjunction with the mirror; a long exposure was required, but any desired result could be obtained. In conclusion, he wished to disclaim priority in the matter. Mr. J. Traill Taylor had worked in this direction twenty-five years ago; more recently a patent had been taken out for the use of a Nicol prism for the purpose.

Mr. C. DIBDIN said that two years ago he had taken photographs by means of a Nicol prism in conjunction with the lens. Twelve months ago he was advised that the idea was new, and, not finding any reference to it, had patented it. Referring to Mr. Acres' article on the subject in the ALMANAC he was satisfied that he (Mr. Acres) had worked it out in his own mind in a scientific spirit. Coming to the paper, Mr. Dibdin observed that Mr. Acres seemed to think that it answered to employ prisms of large size; but there was a great difficulty in this connexion. It was advisable, if they could be got, but for all practical purposes they could not. A prism one inch in its minor section had no advantage over a three-quarter or half-inch, because, although the prism might be widened, it had also to be increased in length; the crystal must be complete, and cut according to its crystallisation; if enlarged in one direction, it had to be enlarged in another. To cover a half-plate, a lens of long focus would have to be employed, and the prism could not be employed with large apertures. He found that the prism had a twofold effect. Not only did it neutralise certain polarised rays, but it overcame halation, as he had found in photographing the bar of a window against the sky, which, with the prism came out clear and sharp, whereas, without, it was hazy.

Mr. T. R. DALLMEYER had seen Mr. Dibdin's results, and regarded them as extraordinarily good. He pointed out that the rotation of the prism gave one a choice of angle. He had observed that there appeared to be no loss of definition by the use of a prism.

Captain ABNEY pointed out that a knowledge of the use of polarised light in photography was not new—indeed, it was common property. Mr. Whipple had tried it at Kew with satisfactory results.

Mr. W. E. DEBENHAM observed that black glass was accessible, whereas Nicol prisms were not so to photographers in general. Mr. A. W. Clayden some year or two back had shown excellent results obtained with the black-glass mirror. Mr. Haddon had recommended patent plate, backed with caramel, for the purpose.

Mr. DIBDIN remarked that Mr. Clayden had tried patent plate, and found that it would not do.

Mr. DALLMEYER observed that the plate glass would give secondary reflection.

Mr. DIBDIN suggested for some subjects the use of a bundle of glass plates. He thought it would answer where definition was not important.

After remarks by the President, Mr. England, and other members, Mr. ACRES replied to some points raised in the discussion. As to the position of the prism, he fitted it into the hood of the lens. The black glass could be rotated with the prism. As regards double reflection by means of plate glass, he showed a piece backed with bitumen which gave double reflection. It was therefore no use at all. Mr. Debenham had said that a piece of black glass could be placed between the lenses. He (Mr. Acres) would like to know how that was done.

A vote of thanks to Mr. Acres concluded the proceedings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 5,—Mr. A. Mackie in the chair.

Mr. A. J. Brown was elected a member of the Association.

The HON. SECRETARY (Mr. T. E. Freshwater) read a communication from the Committee, in which they observed with regret that the editor of *Photographic Work* has declined to apologise for, and withdraw, the unfounded statements reflecting on the character of the Association's meetings made in that paper on March 16, and the Committee regard his remarks of March 30 as an aggravation of the original offence. They also desired to express surprise that Mr. Bolas, the editor of the paper referred to, and the gentleman who they alleged supplied the reports upon which the attacks were based, should continue members of an Association upon which they have both endeavoured to cast discredit. The Committee, having been informed that it is the intention of several members to move for the application of Rule 15, suggest that, in order to avoid such unpleasant proceedings, the Association request Mr. Bolas and the other gentlemen to resign their membership, and that *Photographic Work* will discontinue reporting the proceedings of the Association.

Mr. J. E. HODD thereupon moved, "That the Association instruct the Hon. Secretary to request Messrs. Bolas and Debenham to resign their membership and *Photographic Work* to discontinue reporting the proceedings of the Association."

Mr. T. BOLAS said he seconded the resolution with great pleasure. He was understood to say that, in his opinion, an adequate "apology" had been given. In the course of further remarks, Mr. Bolas said that he should not withdraw any of the statements he had made. Also, he would not resign. He knew he was right, from the fact of his being in a minority. The Society had disgraced itself by excluding ladies.

Mr. W. E. DEBENHAM said he had no official connexion with *Photographic Work*, and complained that his name was included in the resolution without here being evidence to show that he supplied the reports.

Mr. R. CHILD BAYLEY, Mr. E. W. PARFITT, Mr. A. COWAN, and Mr. A. J. BROWN drew attention to evidence of a circumstantial nature pointing to a certain gentleman being the reporter. The latter, however, said he would neither deny nor affirm anything in regard to the matter.

Several fruitless appeals were made to Mr. Bolas to withdraw the statements complained of. The letter was then read *seriatim* by the CHAIRMAN, and denied by the members present.

Mr. P. EVERITT said the remarks complained of were unjustifiable and in bad taste. The Editor had exceeded his licence, had cast an undeserved slur, had not kept within the limits of truth, and ought to withdraw the remarks.

Condemnatory remarks were also made by Mr. HADDON, Mr. WELFORD, the CHAIRMAN, and others. Finally, after an amendment, calling for retractation or withdrawal, had been lost, and a similar fate had overtaken one designed to separate the names of Mr. Bolas and the alleged reporter, Mr. Hodd's resolution was put and declared carried by fourteen to two. Many members did not vote, and the minority of two consisted of Mr. Bolas and Mr. Debenham.

A copy of the *Blue Book of Amateur Photographers*, 1893, was presented by the publishers, Messrs. Sprange & Co.

Some discussion as to the use of nitric acid as a preservative of pyrogallic acid having arisen,

Mr. BOLAS said that nitric acid exercised a specific action on pyro. He had tried to isolate a nitro derivative of pyro, and found that it tended to decompose. Nitric acid, added to a colourless solution of pyro, would nitrate it. He would recommend citric or acetic acid instead. The case against nitric acid as a preservative was that an amateur would probably use too much of it.

Mr. Welford showed negatives on films and plates taken in a hand camera to try the relative speed of the former. The plates were marked 110° H. & D.; the films were the Queen and Mawson's. The exposures were made at the end of February, between half-past four and half-past five, some with the sun, some without; the former were exposed for one twenty-fifth of a second, the latter for one-tenth of a second. The developer used was hydroquinone, and the results were that the films were practically equal in rapidity to the plates.

PHOTOGRAPHIC CLUB.

APRIL 6,—Mr. A. Broad in the chair.

LENSES.

This was the subject of the evening.

Mr. A. MACKIE asked Mr. Dallmeyer his opinion concerning spectacle lenses for photographic work.

Mr. T. R. DALLMEYER stated that two forms were suggested for the purpose: one a plano-convex with the diaphragm in front, the other a meniscus with the diaphragm at back. No doubt they were admirable for some purposes.

Mr. J. NESBIT asked when was the distortion with these lenses barrel-shaped, and when pincushion?

Mr. DALLMEYER said when the stop was in front it was barrel-shaped, and, when at back, pincushion.

Mr. E. W. FOXLEE asked what the Jena glass had enabled opticians to do which they could not do previously?

Mr. DALLMEYER replied that in the older forms of glasses the greater the specific gravity the greater the refractive index, and opticians did not at first believe that great density and low refraction, or low density and high refraction, could exist together. The new glass had demolished this theory, and it was now possible to have a lens concave in exterior which would give a real focus.

Mr. R. CHILD BAYLEY asked if any other solids or liquids gave the same effect.

Mr. DALLMEYER said he thought it would be found, as a rule, that the greater the density of other solids and liquids the greater the refraction.

Mr. NESBIT asked if the new glasses were permanent.

Mr. DALLMEYER said that unfortunately the glasses which gave the finest optical results were liable to deterioration, but in many cases it was possible to sandwich these between glass possessing a greater degree of permanence. The small bubbles frequently found in this new glass were of no optical importance.

Mr. A. COWAN asked if for general work the new lenses gave better results than the old.

Mr. DALLMEYER said that for copying they certainly had a great advantage on account of their flatness of field, but for ordinary outdoor work he did not think much advantage would be found over a good rapid rectilinear properly corrected. The curvature of field in the older forms was in some cases a real advantage; but, notwithstanding this, from an optician's point of view, the Goerz lens was an optical triumph, and the world was indebted to the German government and opticians for their researches.

Mr. F. HAES said an advantage was gained with the Zeiss lens, for you could focus with the largest stop, and stop down to the smallest, without any alteration of focus.

Mr. CONRAD BECK observed that the fact that the new glasses permitted of higher dispersion and lower refraction was an important one, and of great service to opticians.

Mr. F. A. BRIDGE mentioned a photograph, taken with a foreign make of tele-photo lens, in which some railings appeared; those at the edge of the plate, and which were further from the operator, were longer than the nearer ones. Why was this?

Mr. DALLMEYER said it was evidently a case of pincushion distortion.

In reply to a question concerning the Burchett colour-screens, Mr. DALLMEYER said they seemed to give a better rendering of the spectrum, and in a photograph permitted the foreground and sky to be obtained in proper relation. The yellow and green screens used were placed close to the diaphragm slot; if anywhere else, multiple images were obtained. The yellow and green gave the result with the minimum of extra exposure.

Brixton and Clapham Camera Club.—The first Social Meeting, held on April 3, was an unqualified success. No less than ten new members were balloted for, and three new names proposed for membership. Several questions from the question-box were satisfactorily dealt with.

Croydon Camera Club.—Lantern Show.—The last of the present series of public lantern shows was held on Wednesday, April 4, at the Braithwaite Hall, which was literally crammed to repletion, and some 250 slides, all contributed by members of the Club, produced lively satisfaction and sustained the audience's interest to the end. The President (Mr. H. Maclean), as usual, did the talking, and also showed a small set of Isle of Wight and other views. Mr. Bray's figure studies, also an unusually fine view, *The Enchantment of Winter*, Mr. Isaac's *genres*, Mr. Noakes' Lake District series, Mr. Holland's views in South Devon, Mr. J. Smith's excursion groups, Mr. Jenkins' Canterbury illustrations, Mr. Packham's lambkins, and Mr. G. Corden's football studies and local celebrities are only a few of the notable attractions, other good work being shown by Messrs. Whitaker, Bown, Pierce, Wreford, Frost, and Burrough. We must not omit Mr. A. H. Ryan, who, in the absence of Mr. White, with complete satisfaction to all concerned, managed lantern and screen, in addition to which he showed, and amusingly explained, a series of Norwegian slides, taken during a tour last summer. The music in the interval, a banjo team of ladies and gentlemen, was unusually acceptable. It was arranged by Miss Cumbers, to whom, at the instance of the President, the Camera Clubmen and audience accorded loudly expressed thanks.

Ealing Photographic Society.—April 5.—A large audience assembled to see the Lantern-slide Competition for a medal given by the President (Mr. H. W. Peal). There were about twenty sets of slides sent in, and the winner proved to be "Argus" (Mr. F. Crisp, jun.), the Hon. Sec. (Mr. R. Murphy) being second. The winning slides were a very fine set of flower studies. Mr. John A. Hodges, of the West London Society, kindly consented to act as Judge, and his verdict was a very popular one. Afterwards the Amateur Photographic Prize Slides were shown, and were very much admired. Unfortunately the evening was brought to a rather abrupt conclusion, owing to the limes giving out, and no others being obtainable. Messrs. F. G. Rimell and T. K. Allsopp were elected members.

Hackney Photographic Society.—April 3, Mr. R. Beckett in the chair.—The report of the St. Albans excursion was read by the Chairman, and work done on that occasion was shown by Messrs. Hensler, Roofe. Beckett, Gosling, Randall, Hull, and Newton. Work was shown also by Mr. Sodeau. The Hon. Secretary exhibited a new half-plate photographic outfit, which had been made to his order, and which embodied several useful features. In answer to Mr. Fort's query, as to the best way of repacking exposed plates when away from home, Mr. FENTON-JONES said that he repacked the plates with the films facing one way, or, in other words, with the film of one touching the glass of the next. The dozen were then wrapped in paper and wedged tightly into the original plate box. Mr. HENSLER took care to save the small slips of card with which the plates were first packed, and, after exposure, repacked in the same way. Mr. A. BARKER packed them film to film, with nothing between, and found them to travel safely if kept from moving. Mr. GOSLING did the same, and, to secure the latter object, bound the dozen with thread. From the discussion may be gleaned the fact that the important points are, to see that the plates are free from dust, and, when packed together, in whatever way, to secure them in the boxes so that no after-movement can take place. Using so-called preservative paper between the films is inadvisable. Mr. HENSLER inquired as to the best way to remove from a pyro-developed negative an intense yellow stain, which had refused to yield to an ordinary clearing bath. In reply, Edwards's clearing bath was recommended. Mr. GRANT advised bleaching with solution of mercuric chloride, and well washing. Mr. R. BECKETT concurred, and said that the mercuric solution should be acid.

South London Photographic Society.—April 7, Annual Meeting.—The annual report shows that during the past year there has been a considerable increase in the membership, there being 127 paying and 4 honorary members, against a total of 105 last year. Many good and instructive lectures and demonstrations have been given, and several interesting lantern evenings have taken place. The Society has entered two Society competitions, and in one of them it secured the award of an optical lantern. The Exhibition held in November last was the most successful ever held in the district, and, as regarded the quality of the work shown, it compared favourably with exhibitions of a more ambitious character. The members' classes were particularly strong. The classification generally gave satisfaction. Two smoking concerts, in addition to the ordinary meetings, have been held. More interest has been shown in the excursions during the past year, which will apparently be maintained, and steps will be taken to foster it. During the year a whole-plate camera, &c., has been purchased for use by the members, in addition to the 12×10 set. The number of lantern slides available for loan has been increased. The Treasurer then read his balance-sheet, and, after discussion, both it and the report were passed, and arrangements made to wipe off the deficit on the Exhibition account. The election of officers was proceeded with, and resulted as follows:—*President:* Mr. F. W. Edwards.—*Vice-Presidents:* Messrs. S. W. Gardner, Maurice Howell, Dr. Munyard, and Mr. W. Rice.—*Committee:* Messrs. M. Boxall, F. F. Buckle, C. F. Dickinson, Howard Esler, A. Fellows, F. W. Grigg, E. J. Lester, B. Lyon, and W. Miller.—*Curator:* Mr. G. H. Moss.—*Hon. Lanternist:* Mr. J. T. French.—*Hon. Treasurer:* Mr. E. A. Whitby.—*Hon. Secretary:* Mr. Charles H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.—*Hon. Assistant and Excursion Secretary:* Mr. W. F. Slater, 169 Southampton-street, Camberwell, S.E.—*Delegates to the Affiliation Committee* Messrs. F. W. Edwards and C. H. Oakden. The meeting was adjourned.

Bolton Photographic Society.—April 3, Mr. Lees in the chair.—A communication was read from Dr. Mackechnie, who a short time ago left Bolton for California. This gentleman stated that he had put himself into communication with the leading authorities in Santiago, with the view of securing permission to photograph their leading buildings and objects of interest in the locality, and to exchange these with the Bolton Photographic Society for similar objects here. It was promised that, if the proposal met with the approval of the Bolton Society, suitable readings touching the illustrations would also be sent. The Chamber of Commerce and other associations in Santiago heartily approved the proposal. The letter was considered, and it was resolved that the Secretary write to Dr. Mackechnie, stating that they would be glad to co-operate with him in the matter, and hoping that the objects sought to be obtained would prove both instructive and beneficial to the two districts. Mr. Robert Harwood, of the firm of Messrs. Hick, Hargreaves, & Co., exhibited a goodly number of slides by the aid of the lantern, illustrative of his recent *Rambles in the Far East*, accompanying them with a chatty but lucid description. These were very interesting, all the main points touched—the customs of the people, character sketches, &c.—in a very lengthened tour being admirably delineated as the result of instantaneous snap-shots, covering a range from the Thames to Japan.

Sheffield Photographic Society.—April 3, a Musical Evening. The President, Mr. Ernest Beck, in the chair.—The first part of the evening was taken up with an exhibition of lantern slides, all being the work of the members, Mr. J. W. Charlesworth manipulating the lantern in an efficient manner, after which an enjoyable programme was gone through, consisting of pianoforte solos by Mr. A. Rodgers, and songs and recitations by the following local artistes: Messrs. Clifford, Rider, Johnson, and Dawes.

FORTHCOMING EXHIBITIONS.

1894.

April 13–28 ..... *Newcastle-on-Tyne International. Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.

,, 16–28 ..... *New York. T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6518.—"A Dissolving and Effect Slide-carrier for use with a Single Magic Lantern." A. Thorp.—*Dated April*, 1894.

No. 6544.—"Background Carrier for Use in Photography." M. M. Simmer.—*Dated April*, 1894.

No. 6610.—"Improvements in Instruments for Calculating Photographic Exposures." A. Watkins.—*Dated April*, 1894.

No. 6613.—"An Improved Oxyhydrogen Jet for Optical and other Lanterns." A. Blechynden and W. Dunlop.—*Dated April*, 1894.

No. 6687.—"A New or Improved Method of Preparing Drawings and Photographs for Reproduction." I. J. Rubie and J. E. MacManus.—*Dated April*, 1894.

No. 6690.—"Improved Actinic Prints and Improved Method of Producing same." Complete specification. E. J. Tobin and F. G. Bement.—*Dated April*, 1894.

No. 6703.—"Improvements in Dark Slides for Photographic Cameras." A. Clarke.—*Dated April*, 1894.

No. 6772.—"Instantaneous Shutter for Photographic work." J. V. Robinson.—*Dated April*, 1894.

No. 6845.—"An Improved Folding Finder for Photographic Purposes." Communicated by B. Pfeiffer. L. A. Marion, H. Guibout, G. Bishop, F. Bishop, and J. P. Kirk.—*Dated April*, 1894.

No. 6866.—"Improvements in Apparatus for Developing, Fixing, and Toning Photographs." E. F. Mackusick.—*Dated April*, 1894.

No. 6868.—"Improvements in Photographic Camera Apparatus." G. F. Horne.—*Dated April*, 1894.

No. 6899.—"Improvements in the Fronts of Photographic Cameras." W. H. Thompson and P. W. Husbands.—*Dated April*, 1894.

No. 6985.—"Improvements in Automatic Photographic Apparatus." G. de Giraudy and La Société André & Lieutier.—*Dated April*, 1894.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A SUBSTITUTE FOR STAINED-GLASS WINDOWS.

To the Editor.

Sir,—A new application of photography can hardly fail to commend itself to those who follow the art, whether as professionals or amateurs, and I venture to think that the suggestion which I have to make on this subject opens up a very wide field for both classes of photographers.

It is, of course, well known to all that the art of glass-staining has deteriorated to a very great extent, and to obtain a stained-glass window, which has any pretension to artistic merit, is a matter of great difficulty and enormous expense. But a cheap and effective substitute can be obtained by means of a platinotype print on ordinary smooth paper, all that is necessary being to obtain a print of a suitable subject, printed to the ordinary depth, which should then be placed between two sheets of glass, that at the back being either ground glass or ordinary glass of any colour that may harmonise with the subject.

If any of your readers have visited the chapel of Magdalen College, Oxford, they will have been struck with admiration by the lovely sepia window, by Sir Joshua Reynolds, which is one of the most beautiful windows it is possible to conceive.

By the method I have suggested, windows of equal beauty could be obtained; photographs of the works of any of the old masters could be taken, and, by backing the prints with the desired colour, an effect equally beautiful and absolutely permanent would be obtained at a mere trifling cost.

This method also lends itself admirably to the making of window screens, lantern shades, and a variety of other decorative methods of treatment. The great advantages that platinotype prints have over ordinary glass transparencies are their ease of manipulation and absolute permanency; and the fact that a picture so mounted can be used as a transparency in the window by day, and at night can be hung on the wall as a picture, or, inserted in the panels of an overmantel, would appear as a print by day, and, by having an incandescent electric lamp behind, could, by a turn of the switch, be converted into a beautiful transparency.

For those who like a more ornate style of decoration it is quite possible, by using glasses of different colours or substituting coloured tissue papers, to get most beautiful effects.

I have treated a platinotype print of a yacht taken by Messrs. Symonds & Co. in this way. Having first placed a double thickness of light blue tissue paper behind the whole print, I then put a single thickness of pink paper to cover the upper part of the print down to the water-line; the effect is to make the water appear of a greenish hue, whilst the upper part gives the appearance of a late evening effect.

Applied to portraiture, the face seems to acquire a roundness and brightness which is very striking, the effect being almost like that produced by the stereoscope. In fact, the subject opens up such an endless variety of methods of treatment suited to individual tastes that I fear to trespass further on your space, but trust that some of your readers will try the plan and give us the benefit of their suggestions and experience.—I am, yours, &c., Ernest J. Humphery.

1, *Charlotte street, Bedford-square, W.C., April* 9, 1894.

A ONE-SIDED ARRANGEMENT.

To the Editor.

Sir,—Some two months since I received a circular letter from one of the leading illustrated papers—*Black and White*—in which the editors asked me to allow them to add my name to their list of photographers, with a view to my sending them photographs for publication. With the reservation that I had a prior arrangement with the *Gentlewoman*—which was hardly likely, though, to clash with them—I assented, and, in due course, received another circular letter, thanking me, asking me to send photographs of events of first-class importance, and assuring me of the creditable manner in which reproductions of my work would be executed, and of their desire to do the utmost to make the arrangement one of mutual advantage.

To an ordinary mind, I think this would be taken to mean that if I sent good photographs of an event of first-class importance in reasonable time, they would be published. We shall now see how the arrangement works when it gets a little further than printers' ink; and, since my experience may be repeated by any other photographer who has fallen in with it, I think that the matter is of sufficient general importance to be made public in your columns. Upon Wednesday week last, March 28, an event of no little importance occurred here in the unveiling of a statue of John Howard. I secured a very successful 12 × 10 negative of the scene, and, being wishful to do all I could, I determined to make a similar photograph of the statue alone. The light for this was best in the early morning, but, as there was no sunshine on the next day, it was done on the Friday. No time was lost in getting a print from this, and both were posted the same evening, arriving at the office of the paper by first post on Saturday morning. I have had some experience of the time occupied in work of this sort, and knew that my pictures were sent in ample time for the next week's issue, and so was not a little surprised to receive a letter from the editor that my photographs had arrived too late, and that he had already accepted photographs, though he regretted that he had not received mine when he got the others. My photographs could hardly have been returned, though, with this letter, since they only reached me on the following Thursday.

I may here remark that I had made no attempt to get my work into other papers with the exception of the one I have spoken of as having a prior claim. This was sent by the same post as the others, and duly

appeared last week, though much reduced in size. Later I sent copies to the Illustrated Journals Photographic Supply Company, only to find, of course, that I was now really too late, and that any benefit, other than local, the work would have been to me was lost. In returning the photographs, they say, "they are excellent pictures, and, had we received them on Saturday or Monday, we could have placed them in half a dozen journals."

I have only to add that I have withdrawn my name from this "list of photographers," and, though I have been requested to reconsider my decision, I have declined to do so.—I am, yours, &c., DRURY STOWE.

Bedford, April 9, 1894.

THE BENEVOLENT.

To the EDITOR.

SIR,—I am sure the Benevolent Association is indebted to Mr. Sweet for his interest on its behalf, and for his offer to collect money. The Association's collecting boxes have been, as you know, in existence for many years, and I believe is practically the only one which has ever returned anything to the Association from collections in the ordinary way. Mr. Richard Wicks, on behalf of the Brighton Photographic Enlarging Co., kindly took one of our boxes last year, and by asking each of his assistants to contribute a small trifle weekly, and by seeing that the amount was collected, was able in a few months to send us a sum of nearly 2*l*. The Photographic Society of Great Britain has a box on its mantelpiece, from which we occasionally receive a few shillings. These, so far as I know, are the only bright spots in a dark history of collecting boxes, for I understand that a number which were issued a few years ago, when a similar suggestion was made, have not yielded sufficient result to pay the cost of the boxes themselves.

A former Secretary went to great labour and some expense by sending collecting boxes to exhibitions and conventions, but the experience was that they were almost entirely neglected, and the receipts did not pay for the cost of carriage.

I mention these experiences because the suggestion of collecting boxes has been made several times lately, and coupled with it an expression of wonder at the apathy of the Benevolent in "never having thought of it." One of our best friends, Mr. Fenton-Jones, of the Hackney Society, has recently taken a collecting box, which he hopes to fill, I believe, by means of small fines inflicted in a good-humoured way, and other societies might well follow this example, as I hope that photographers will follow the example of Mr. Sweet.

The Association will be very pleased to supply boxes to any one who will undertake to collect, but I would make the suggestion (on my own responsibility, and not on behalf of the Committee) that any one doing so should undertake to send at least five shillings, otherwise we may repeat our old experience of paying more for the making and sending of boxes than we receive from them.—I am, yours, &c.,

The Photographers' Benevolent Association, H. SNOWDEN WARD,
Memorial Hall, Ludgate-circus, E.C., *Secretary.*
April 7, 1894.

DECLINE OF PHOTOGRAPHIC BUSINESS.

To the EDITOR.

SIR,—If I may be permitted space in your valuable JOURNAL, I should like to make a few remarks upon some opinions expressed in the columns of your late issue.

Referring, first, to your article on the "Decline of Photographic Business," I think the attention of professional photographers should be specially directed to your forcible observations respecting the degrading influence that cheap retouching has on photographic portraiture.

Nothing could be truer than your statements on that head.

In the wet-plate days, those "good old times when beef and beauty flourished," the best photographers would never have sanctioned the destructive retouching so prevalent now. They employed men of the highest ability only, and paid them liberally—men who could impart life and character to the negative where those essentials were wanting, and who only flattered, if flattery it be, by refinement and subtlety of expression.

It is quite obvious that work of this description must have enhanced the reputation of those who employed it, and indeed helped largely to make their fortunes.

But photographers were ever loth to recognise the value and importance of the retoucher; they wanted all the credit of production themselves, and so, with the advent of the gelatine plate came a brood of cheap retouchers, they welcomed them all round, and did not scruple to lower the salaries of their old and tried hands because of the cheap work offered.

The result every one knows; the best retouchers, the real "miniaturist," turned their talents to other branches of art, and left the field to their rivals. One word more and I have done.

In Mr. Maskell's effusion on *Some Landmarks in the History of Pictorial Photography*, I find the statement, "*At last*, also, it has come to be admitted that the scientific perfect negative has no meaning artistically, and that in fact, except for other purposes, the term "perfect negative" is about as expressive as "perfect lump of chalk."

Now, this seems very like "knocking tacks in with a bar of soap," as the Americans have it.

What photographer ever disputed such a palpable truism? As if the term *perfect*, when applied to such an essentially photographic production as a negative or otherwise, could have any meaning *artistically!*

And yet Mr. Mr. Maskell solemnly tells us that *at last* this truth is admitted. As regards the strict propriety of the term, in the sense in which it is used by photographers, that may be easily demonstrated, *e.g.*, a negative must be either good, bad, or indifferent, and the term *perfect* may be as justly applied to the best negative obtainable of any subject copied as to anything else mundane.—I am, yours, &c.,

April 4, 1894. MICHAEL E. BANGER.

STEREOSCOPIC HAND CAMERAS.

To the EDITOR.

SIR,—I notice in your issue of this date an interesting article upon stereoscopic hand cameras. You mention two firms only as making stereoscopic hand cameras. I must ask you to kindly add another firm, who have made for some time a most perfect camera, viz., the Stereoscopic Company's "Twin Artist's" stereoscopic camera, which has a third or finder lens, giving to the user at the time of focussing an exact copy of the picture he will secure upon the negative. They also have a very portable folding mahogany stereoscopic hand camera.

Trusting you will kindly find space for this letter I am, yours, &c.,

72 *and* 73, *Fore-street, London, April* 6, 1894. A. E. STALEY.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange unbound volume of *Photography* for 1893 for set of scales and weights.—Address, J. A. LOMAX, 78, Park-road, Chorley.

Exchange 10×8 camera, modern, and lens for 12×10 euryscope or rectilinear by good maker.—Address, H. EVANS, Market-place, Kettering.

Will exchange good 10×8 camera, lens and slides, for first-class half-plate camera, lens, and slide.—Address, D. MORGAN, 42, Donegall-place, Belfast.

Wanted, a half-plate rapid rectilinear lens by good maker. Exchange Eastman's whole-plate roller slide (new).—Address, E. PENFOLD, Upper Tooting.

Wanted, first-class whole-plate, or larger, photographic set in exchange for practically new pneumatic safety bicycle.—Address, CHARLES, 37, Tunis-road, London, W.

Good violin, bow, and case wanted to exchange for studio stand, burnisher, or backgrounds.—Address, Miss RICHARDSON, 22, Gaythorne-terrace, Clayton, Bradford.

Wanted, whole-plate wide-angle lens, in exchange for forty one shilling numbers of *Our Own Country*, illustrated, clean, uncut.—Address, H. J. RIDLINTON, East Gate, Warwick.

Wanted to exchange a seven-string banjo, in American leather case, for half-plate camera or a hand camera.—Address, A. COX, 26, Edward-road, Clarendon Park, Leicester.

Quarter-plate hand camera, to take twelve or eighteen dry plates, will be exchanged for 10×8 or 8½×6½ rapid rectilinear or portrait lens.—Address, Mr. HOLMES, 136, Derby-road, Heanor.

Eight volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY, complete with illustrations, three bound in green, for five-inch condenser.—Address, S. SIDEY, 35, Richmond-road, Dalston, N.E.

Exchange THE BRITISH JOURNAL OF PHOTOGRAPHY for past seven years, and one bound volume, No. 24, for a few good lantern slides.—Address, F. E. JONES, Belle Vue Studio, Cinderford, Gloucestershire.

I will exchange whole-plate camera with bellows body, swing back, and three double dark slides, in good condition, for studio camera by good maker.—Address, T. WEBB, 8, Zingari-terrace, Forest Gate, E.

Will exchange a new double-barrelled, breechloading gun, cost 4*l*. 10*s*., for whole-plate camera (modern), in good condition, with two or more double backs, no lens.—Address, J. F. MURDOCH, The Studio, Dunbar.

Will exchange 10×8 bellows camera, with one single dark slide, and studio stand, for portable whole-plate or 10×8 camera, with three double slides.—Address, J. H. BARBER, Albert Studio, Lindley, Huddersfield.

Will exchange Dallmeyer's 1B rapid portrait lens for Optimus 8×5 rapid rectilinear, with Thornton-Pickard time and instantaneous shutter and speed indicator.—Address, W. CHESTER, Eden Grove, near Penrith.

Will exchange a metronome with bell and small collection of 300 stamps in Lincoln Album for the new photoret or watch camera, or other hand camera, particulars to J. FISHER, 36, Station-road, Sandown, Isle of Wight.

Russian iron lantern, four-inch condensers, three-wick lamp, &c., all complete, cost 4*l*., in exchange for wide-angle half-plate lens by good maker, or first-class backgrounds.—Address, M. M. THOMPSTONE, Brooklands, Manchester

Wanted a nine-inch double condenser for enlarging, in exchange for a Lancaster half-plate Instanto camera and four double backs, or a good forty-feet steel hydrogen cylinder, nearly new.—Address, J. DIXON, Photographer, Colne.

Wanted Midget lens to take four or more on one plate; exchange microscope and good telescope. Microscope has three powers, reflector, condenser, and slides in mahogany case.—Address, H. STEEL, 74, Goldstone-road, West Brighton.

Will exchange first-class whole-plate set, with half-plate back, two whole-plate slides, and changing box to hold ten half-plates, with rectilinear lens and tripod, for good 12×10 or 15×12 set.—Address, SYDNEY ANSTEE, 37, Wellington-street, Luton.

I will exchange small out-door show-case, THE BRITISH JOURNAL OF PHOTOGRAPHY from 1890 to 1893, Zoka hand camera, and Tylar's washer, for clouded or graduated background and tapestry curtain; difference adjusted.—Address, FRED. C. D. HURD, Shepton-Mallet.

Wanted, 9×7 rapid rectilinear lens, iris diaphragm, in exchange for quarter-plate camera and three double slides by Talbot & Eamer; also three-fold walnut tripod, and Taylor & Hobson's view finder.—Address, J. K. SMITH, Tobacconist, Little London, Rawdon, near Leeds.

Wanted, whole-plate wide-angle lens, and half-plate rapid rectilinear, by good makers, and half-plate studio camera and light balustrade; exchange half-plate and whole-plate portrait lenses, Grubb's 12×10 C patent, whole-plate studio camera; list sent.—Address, E. PENFOLD, Upper Tooting

Will exchange hand camera for twelve quarter-plates, pneumatic release, two half-plate metal slides and focussing screen, Cowan's printing frame for opals and transparencies, dishes, &c., for half-plate or whole-plate rapid rectilinear lens.—Address, E. C. BALLEY, 80, St. James's-road, Tunbridge Wells.

Wanted, Ross' No. 2 universal lens, quadruplex enameller, with oil or spirit heater, fifteen-inch roll, or Rouch's Eureka hand camera, either in perfect condition, in exchange for Dallas banjo No. 875, as new, cost 6*l.* 6*s.*, also case and music.—Address, H. W. BURBRIDGE, Vanbrugh-park, Blackheath, S.E.

Will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY from August 12, 1892, containing THE LANTERN SUPPLEMENT, all in excellent condition, for *Collytype and Photo-lithography*, by Dr. Julius Schnauz; or, *Photo-mechanical Printing*, by Prof. W. K. Burton.—Address, H. FRANCIS, 24, Meadow-road, Fentiman-road, S.W.

Wanted, whole-plate modern camera, with three slides and rapid rectilinear lens, in exchange for Talbot & Eamer quarter-plate camera, three slides, Taylor & Hobson finder, and tureefold tripod; also fourfold Japanese screen, black and gold, stands six feet high, almost new.—Address, J. K. SMITH, Tobacconist, Apperley-lane, Little London, Rawdon, near Leeds.

Complete volume of *Photography* for 1893, unbound; first three numbers of the *Photogram*; THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1894, and twenty-six numbers of other photographic periodicals; also first fifty numbers of the *Million*. Will exchange for quarter or half-plate printing frames, for half-plate camera case.—Address, J. A. LOMAX, 78, Park-road, Chorley.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

H. W. Leach.—No address enclosed.

"SILVERDALE."—Will this correspondent oblige with his address. A letter awaits him.

CROOP.—Possibly a mistake was committed. There is no "usual custom" in such matters.

ILFORD.—Consult the ALMANAC, wherein you will find several reducing and intensifying formulæ.

W. A. JACKSON.—Dark blue or green will be a good colour both for the top blinds and side curtains.

MEMORIAL WINDOW.—Under the conditions you name, we do not think you could improve on an ordinary plate backed with caramel.

PHOTO.—The right distance, according to the effect desired, is best arrived at by actual experiment. A few trials at different distances will indicate which will answer your purpose best.

FAIR PLAY.—The deed seems to be a long rigmarole, but if the masters agree by it to teach the apprentice photography "in all its branches," if they are capable of doing so, we see nothing to object to.

A. M. Z.—Approximately, with normal exposure, we should be inclined to recommend pyro, 2 grains; bromide, 1 grain; ammonia (·880), 3 minims; substituting carbonate of soda for the ammonia, 6 grains to each grain of pyro.

T. BOLLAND.—If the trip only entails an eight hours' sea voyage each way, there is no necessity to have the plates packed in tin cases to avoid "sea air." There will be no difficulty with the Dutch Customs' authorities if you politely explain that the packages contain photographic plates.

T. E. A.—You may safely buy the triplet; it is an excellent form of lens for copying purposes. Indeed, many who make copying a speciality prefer the triplet to any other kind of lens. It is a mistake to say that triplet lenses are obsolete; they still figure in the catalogue of one of the leading opticians of London.

T. MATHIAS says: "I received an anonymous letter; should be very thankful if you could advise me how to proceed. As I have the suspected person's handwriting (besides the anonymous), although the letter was written in a disguised manner, it can be easily seen from certain letters that it is the same writer."—This, in our opinion, is a matter for legal treatment.

LEEDS writes as follows: "I have some carbon prints on rough drawing-paper, which I wish to mount, and yet preserve the rough surface. Of course, they must not be rolled, as that would destroy it. What must they be mounted with?"—The best mountant for a novice to use is starch paste, made thick, allowed to cool, and then well beaten up. It should be applied with a piece of sponge.

A. V. JOHNSON says: "Having in my possession and for disposal the old willow-patterned plate which contains the portrait (burnt into the centre) of Albert Smith, Esq., author and writer, and hearing it to be of value, I thought, being a constant reader of your JOURNAL, I would write to you and ask if you could tell me the value of it."—We cannot hazard an opinion. Perhaps those of our readers who are versed in such matters will assist our correspondent.

A. HENDRIC.—If the preservative bath of citric acid has become discoloured so that it stains the paper, it should be discarded, and a new one made. We should not like to say that offensive smelling paper is *the* source of so many albumen prints fading, because we have prints by us, made on such paper, that show but little signs of deterioration after twenty years' keeping. Theoretically, paper prepared with perfectly fresh albumen is preferable to that of the malodorous kind.

DAVID LLOYD (Kidwelly).—1. A hypo bath that has been used for prints may safely be used for plates, but not *vice versâ*. 2. Yes. See an article on the subject of stripping negatives in the JOURNAL for May 12, 1893. 3. The negative is too thin; intensify it. 4. Dunmore's *Photographers' Companion*, of our Publishers, post free, 1*s.* 3*d.* 5. The "colour" does not matter, so long as it is the right density—that is, the face should print in proper gradation relative to the other parts of the image.

VINDEX asks: "Is there any way to avoid the brown stain on negatives when reducing by ferridcyanide and hypo? Upon reducing a sky or a bit of halation, this brown stain is left after repeated applications of the reducer, and causes the part to be extremely slow in printing. Also, what makes this reducer seem to be very much less powerful at one time than another, though mixed quite fresh?"—1. Possibly immersion in a strong solution of hypo will discharge the stain. 2. We are unable to say.

S. B. says: "Three years ago I bought an old-established business, which included some fine negatives taken by a former proprietor who died ten years or more ago. I believe they were made copyright at the time, and now the negatives are likely to become valuable. Would it be better for me to make them copyright again before issuing prints, or can I rely upon the old copyright?"—If the author of the photographs has been dead ten years the copyright has lapsed. Of course they cannot be copyrighted again.

C. A. JOHNSON.—1. Although a lens of the rapid rectilinear type of eleven-inch focus may cover, if stopped down, a twelve by ten plate, it is very doubtful if it will do so when the subject is a fine-line engraving that must be rendered perfectly sharp to the extreme corners, and with even illumination. If it can be made to do so, it will only be by the employment of a very small stop. 2. No advantage will be gained by placing a glass before the print when it is copied if it can be got flat without; indeed, the glass would be injurious.

W. W. C. asks if there is any rule with regard to assistants leaving a berth as to specimens. He says he has been in his present situation nearly two years, and through a quarrel is now leaving, and the employer refuses to let him have specimens of some of the portraits he took during the time, and wants to know if he cannot legally demand them as a "custom of the trade."—No. Employers usually let *employés* have a few specimens on leaving to aid them in obtaining other employment, but only as a matter of courtesy. There is no legal right to them.

FATHER writes: "Nearly two years and a half ago I apprenticed one of my sons to a photographer to learn all branches of the business. From the first he has been working exclusively at the place where the printing and mounting is done. For the first six months he was little more than a drudge and errand lad, now he is termed the head printer. He will be out of his time in about seven months, and has had nothing whatever to do in taking the portraits. Is this right?"—Certainly not. Studio work is the most important branch of a portrait business. Point that out to the master, and if the thing is not altered at once consult a solicitor. The master is bound to teach the apprentice his trade.

*** Several answers in our next.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1772. Vol. XLI.—APRIL 20, 1894.

THE PHOTOGRAPHIC COPYRIGHT UNION.

Preparatory to devoting some portion of our space to matters connected with photographic copyright, we again desire to draw special attention to the Copyright Union which has recently been established in London, and to its prospective value to every portrait and landscape photographer in the kingdom.

Our readers are already aware that this Union was formed in January last as a species of adjunct to the London Chamber of Commerce, of which there is a section having regard to photography, and we are now able to record what has been achieved by the Committee of Management, of which a meeting was held on Friday evening last week. This was given in the most concise manner by the Chairman, Mr. Frank Bishop, who said:—

It will be in the recollection of many here present that, at the last meeting of the Photographic Copyright Union at St. James's Restaurant, a Committee was appointed to make known to photographers generally what resolutions had been passed at our different meetings, and to ask them if they were willing to agree to the same. Your Committee now come before you to give an account of what they have done to carry out this object.

A first meeting was held at the place of business of one of the Committee, and a circular was drafted which, I think, I need not read to you, as you have all seen it, and it was determined that it should be sent to every photographer in the United Kingdom, with a request that those agreeing to it would kindly sign the same and return to us.

At this meeting it was felt a *locum tenens* was very desirable, and, as most of the Committee were also members of the Photographic Trade section of the London Chamber of Commerce, it was happily suggested that this important association might be willing to lend their aid to the object we had in view. Mr. Kenric Murray, the Secretary, was approached, and he most courteously promised us every assistance. We had the use of their room in Botolph House, Eastcheap, and we were enabled to invite the different gentlemen connected with the photographic press to a meeting there, and to lay before them the objects we had in view, and to ask them to give us their powerful assistance. This was unanimously promised, and, I may say, cordially carried out by the various photographic journals.

The London Chamber of Commerce generously supplied us with their official paper and envelopes without any charge for us to print our circular on, and took on themselves to receive all the reply letters—in fact, the Committee cannot sufficiently thank them for their generous assistance. To address 3400 circulars is no easy task, but all things are easy in London if you know how to go to work. The firm of Smith & Co., circular-addressers, got them off in one afternoon, to be in the hands of all the photographers at the time a notice of our proceedings appeared in the photographic journals.

Well, then, how have the profession received our appeal? We cannot say we have had 3400 signatures agreeing and binding the signers to our resolutions, but we have had over 800, and your Committee think this is fairly satisfactory. There has been another gratifying point. Numberless letters have been received from photographers from all parts of the country expressing the most enthusiastic approval of the steps that you, gentlemen, have taken to protect the interests of the profession.

Your Committee may add that there is evidence of a great desire among photographers to uphold their rights, but an uncertainty of how they should do it, and a great seeking for advice. This, gentlemen, probably may be a question for further action, but our immediate object is to tell you the result of our labours thus far. It is gratifying to observe the amicable relations which now exist between the illustrated press and photographers, and the willingness with which they, with two or three exceptions, pay the fees for the use of copyrights. This appears to us to be a distinct gain, for, whereas formerly the rights of photographers were almost invariably ignored, the proprietors and managers of illustrated papers, with the trifling exceptions alluded to, now acknowledge tha photographers have a right in their property as well as the rest of the community.

As to what action you may wish to take in the future, it is for you, gentlemen, to decide. I, for one, should much regret to withdraw my hand from the plough now that it has entered the soil.

The excellent response exceeds that which might reasonably enough have been expected from a body of men who like to take plenty of time to think a matter over before moving in it, and it proves the attractiveness of the prospectus which was presented for their consideration.

That this Committee, which had done such good work, and had got in touch with so many members of the profession, was not allowed to retire, but was promptly re-elected, goes without saying, and those who, as we do, know personally the constitution of that body will feel that photographers are to be congratulated on having their interests entrusted to such capable men.

It is obviously to the interest of every photographer to give this Union his moral support. It is one of those things that costs little, but may be worth much. The expenses of inaugurating the union have been generously borne by a few of those by whom it has been established; but, in order that it may henceforth be self-supporting, it is proposed that a small percentage —say five or ten per cent.—of the money which photographers receive through its agency, and which but for it might probably not be received at all, shall be devoted to establishing a fund for defraying necessary expenses, such as the cost of correspondence, obtaining legal advice for its members in cases of disputes over copyright works, and piracy of such works by the illustrated press or others, a crime now frequently indulged in for want of a body capable of taking effective concerted action, collecting and transmitting moneys obtained, which can rarely be done by members residing in distant parts of the provinces so well as by an important body associated with an influential organization like the Chamber of Commerce. These reasons, which are tangible ones, appealing directly to the interests, through the pockets, of photographers, ought to prove strong enough to induce every one to lose not a day in sending in this adhesion to this body.

A letter addressed, The Secretary of the Photographic

Copyright Union, London Chamber of Commerce, Botolph House, East-cheap, London, will receive immediate attention.

We are well aware that a strong desire and need for advice prevails throughout the kingdom. Speaking for ourselves, there is now scarcely a single week in which we do not receive complaints from unfortunate photographers who consider themselves victimised in some form or other by acts of sharp practice connected with such topics as subjects for copyright, the ownership of the negative, what constitutes valid registration, &c., and occasionally we perceive verdicts that are simply astounding given by magistrates when disputed cases are brought before them for decision, arising from ignorance of the law and the custom of the profession.

The existing Copyright Act of 1862 is confessedly imperfect in several respects, for it was somewhat hurriedly drawn up and as hastily run through Parliament by its friends on the principle of "half a loaf being better than no bread." Since that time opinions have been consolidated, and precedents in the interpretation of the law have been established, which obviate in some slight degree the intricate and involved phraseology of the Statute and the difficulty of construction arising therefrom.

In another article we shall give the text of the Copyright Act, point out its salient features, and indicate wherein, in our estimation, it falls short of the every-day requirements of photographers.

THE BEST LIGHT-DIFFUSERS.

As the present is the time of the year when, owing to the continually increasing meridian height of the sun, studio difficulties arise through the unwelcome intrusion of rays of sunlight athwart the path of the lens, we have deemed it seasonable to make mention of some experiments we have been making as to the value of various media recommended by one or the other for softening the sun's light, or diffusing refracted light from otherwise useless windows into a useful channel. It is not our purpose to dogmatise, for we well know that, when once a particular plan has been adopted, its owner finds such difficulty in changing or readapting it that he usually falls back on the conservative argument, It is perfect and cannot be improved upon. Translucent materials, fixed or portable, are employed in great variety, and for the two purposes of either reducing the illumination of atmospheric particles—in other words, sunbeams—which cause fog, diffused or in streaks, according to their extent or placing, upon such portions of the glass, which, while permitting daylight to enter and illuminate the studio where it is not wanted, fail to arrive where it is wanted, that is to say, upon the sitter himself. The permanent means employed are ground glass (usually called "obscured" by the glass dealers), hammered plate, and ribbed glass.

Hammered plate is usually so thick that we found a large portion of actinic light sacrified by absorption, and, while its diffusive powers on sunbeams were the least satisfactory of any, we found its effects on useless windows to be also of least effect. This effect we will speak of as the refractive power. Ribbed glass was an improvement, both in the sense of the state of surface and also through its being readily obtainable of thinner substance. Obscured glass proved to be superior to all, by reason of the small amount of light absorbed (it can be obtained of any thickness that ordinary window glass is made in), and also from the superiority of its surface both in diffusing and refracting effect. Of course, the great disadvantage of any fixed medium is, that it cannot be temporarily removed when there is no occasion for its employment, and for that reason there are many cases where its use would be unadvisable. Further, it is open to the objection that it is difficult to clean readily, and also that, after the lapse of a few years—more or less according to its position and to its relation to smoke or air currents—it is practically impossible to thoroughly cleanse the surface. The consequence of this is, that eventually it becomes grimy in hue, and decidedly yellow in colour, robbing the light of much of its actinic value.

We are thus led to a consideration of temporary or removable screens, which, whatever other good points they possess, have the inestimable value of being able to be removed with ease whenever it is desired to discard them or replace them by other or fresh ones. For this purpose there have been recommended thin linen or cotton-woven fabrics, tissue paper, tracing cloth, tracing linen, and coatings of oil or water-colour paint upon the inner side of the glass to be "shaded."

Woven fabrics are very handy, as they can be hung curtain-wise, and removed or regulated with ease. It is difficult to obtain them so thin as not to be strongly light-obstructive, and there is the further trouble that they quickly become so soiled by handling or dust as to require repeated washing if they are to retain their pristine purity or least obstructive power.

Probably the most generally employed screen is tissue paper, as it can be so quickly set up or taken down by the use of drawing pins or tin tacks. In some studios it is secured in position by gum or paste. It should be remembered that the plan sometimes adopted of pasting it down to the glass robs it of most of its character. It becomes then more like plain glass, and loses much of its diffusing power. This will account for its failure in the hands of some workers, who have found it of no use when tried for the purposes named. Tracing paper is very good; but, as it is mostly made translucent by oily or resinous ingredients, it is comparatively yellow in colour, and, by the action of light, this colour becomes more marked. There is an immense variety of tracing papers to be bought, but most of them are open to this objection.

For light-diffusing or refracting power tracing cloth seems to offer most advantages, and having a glazed surface it is readily cleansed by a dry cloth. As this is so useful a substance, we will treat it a little more fully. It is sold in two conditions, glazed on both sides, or on one side only, the other having a dead surface to receive colour for draughtsmen's work. The former is the kind that should be chosen, as it keeps clean for so much longer a time. Then, again, there are nowadays two kinds to be had, one the older rendered translucent by some substance of the nature of starch, and the other treated like the tracing papers we have mentioned by an oily or varnish-like substance, and easily to be distinguished by its smell. The latter kind thould on no account be chosen, as it robs the light and transmits a yellowish-tinted ray only, which also deepens with the action of light. The kind we recommend can be bought in rolls of twenty-four yards, in widths of eighteen, thirty, thirty-six, forty, forty-two, and forty-seven inches wide. It cannot be folded or hung like linen, and is best put either upon movable frames or fixed upon ordinary blind rollers. If it is to cover a roof, it can be kept from sagging by a few stretched wires placed at intervals of about three feet.

Finally, we come to an application of paint, or similar substance. This is really most excellent for both effects, and if a

suitable oil paint—as supplied by the drysalter for "frosting"—be chosen, nothing can excel it; but this gradually becomes yellow in time, and loses its value. When this happens, the simplest plan is to remove it by washing with a dilute solution of caustic soda. It comes away at once, after a little gentle friction with a sponge.

Zinc white with glue or starch is also very good; but the objection to these is the liability to removal or streaking when the roof leaks or is moist through cold outer air. Simple starch paste was also used, but its diffusive effect was insufficient, and we could not find any advantage its use entailed. With this narration of types, we leave the matter in our readers' hands, trusting that they may find some value in the record.

THE PROPER DENSITY IN PORTRAIT NEGATIVES.

The question, "What constitutes a really good printing negative?" is infinitely more difficult to answer at the present day than was the case formerly, when the printing was done almost wholly upon albumenised paper. Then one general type of negative answered all purposes, and, should any accidental variation from the usual style and quality occur, it was comparatively easy to meet it by corresponding modification in the printing process. Thus, the simple expedient of printing under ground glass or tissue paper, would often meet the requirements of a negative that was only a little too thin, or in worse cases the use of a stronger sensitising bath effected the purpose. The reverse conditions seldom arose, for the tendency in those days was rather to aim at the greatest possible density obtainable in the negative, and to trust to lengthened exposure in the printing frame, for the production of detail in the light and half-tones. The shadows were, in fact, practically left to take care of themselves, and the "bronzed" appearance of an untoned albumen print of twenty or more years ago would astonish a photographer of the present day.

With the substitution of iron for pyro development the extreme density, formerly the rule, was not so easily obtained, and it began to be recognised that the thinner images were capable of giving equally good results, if not indeed better, than those formerly the case; and with the subsequent introduction of retouching and modifications in the quality of the commercial albumen papers the old type of pyro-developed negative requiring some hours' printing in sunshine entirely gave place to a more delicate style of image.

On the introduction of gelatine plates in 1878, a still thinner and more delicate class of image came into vogue, not so much because it was sought after by photographers, but rather because they were in a measure unable to help themselves; and it will be remembered that for some years the cry of "want of sparkle" was raised against the new plates, which were for a long time believed even by some of the most experienced workers to be inferior to collodion plates in respect of density and gradation.

It is many years now since increased experience in working, coupled undoubtedly with improvements in the films themselves, relieved gelatine plates from this imputation, and it may be accepted as a fact that the average work of to-day is quite equal to that of the best days of wet collodion. Further than this, we think that much of the work is of a decidedly better quality than formerly, or that now there is a larger percentage of good work, owing to the easy adaptability of gelatine plates to the production of negatives of any desired type.

But, at the same time that gelatine plates and their manipulations have been improving, we have also had introduced numerous methods of printing that were hitherto unknown, and all of which require, for the production of the finest results, negatives of a more or less varying character as regards density and gradation. While this plethora of printing processes places fresh power in the hands of the modern photographer, it at the same time constitutes somewhat of a difficulty in the case of those who are in the habit of employing different methods of printing, as, for instance, silver and platinum or carbon. Individually, both silver and carbon are susceptible of considerable modification in use, and so, to a more limited extent, is platinum, but separately they require negatives of quite different character, so that the photographer who desires to utilise the same negatives for more than one process is placed at somewhat of a disadvantage, unless, indeed, he exercise some care in the selection of his methods.

This, of course, the professional will always do, though it is to be feared that the amateur is not always so careful. Besides which, too, the amateur, either from want of skill or more probably from negligence, seldom secures any degree of uniformity in the character of his image, but remains content with whatever sort of negative he may get, provided it possesses the qualities that go to make a "good negative."

But here the difficulty arises, What constitutes a good negative? The good negative—that is, the *best* negative—for one process of reproduction may be far removed from the first position when applied to another method of printing. For instance, the negatives that give the finest prints with albumenised paper will behave in a very inferior manner if used with one particular kind of gelatino-chloride paper; while even with different brands of the latter kind of paper the difference of behaviour may be so great as to render the same negative utterly unsuitable for one or the other. From this cause alone, no doubt, arise by far the greater number of the complaints we hear of failures with one or other of the modern printing methods, and the condemnatory remarks expressed with regard to this or that commercial product.

But while the careful man may find it easy to adapt his method of working to the requirements of any particular process—may, in fact, by aiming at a certain standard of negative, secure uniformity and quality of results—the less careful individual may find actual advantage in the multiplicity of processes; for, while his negatives may represent every variety of image, from dense to thin, from flat to vigorous, by choosing his printing process for each, all may give good results; instead of which, it is too frequently the case that the most opposite types of negative are attempted to be worked with the same kind of paper.

Of the different processes available, those that lend themselves most unduly to negatives of varying character are undoubtedly the carbon and albumenised paper processes, the latter being of the home-sensitised kind, and not prepared specially for keeping. The advantages in both these processes lies in the fact that the photographer has the power of varying the strength of his sensitising solution, to so modify the properties of the printing surface as to adapt it to images of the most widely different character. As regards the platinum, gelatino-chloride, and other processes, the products of which are commercial articles, although it is possible in the process of manufacture to vary their qualities, this power is not with

the consumer, who is compelled to use what is given him. Still, even here he possesses a considerable power of judicious selection, which enables him, if he be so inclined, to choose his printing surface to suit the particular negative.

Thus, for the delicate negatives, replete with detail, produced by the aid of some of the newer developers, most of the commercial gelatino-chloride papers are especially suitable, although we have met with more than one sample of this kind of paper possessing quite opposite properties. For stronger and more robust negatives albumenised paper or platinotype will give better results, while from really "hard" negatives the matt and rough-surface papers give the most harmonious pictures.

The class of negative that, in a general way, lends itself best to variations in printing is that of medium strength, tending rather to softness, though with full density in the highest lights. The kind of negative referred to is one that shows neither a great amount of clear glass nor anything approaching opacity in the lights, both signs of under-exposure; and an under-exposed negative is, of all kinds, the most hopeless. The exposure must be ample without being too long, and the development carried to such a stage that even the finest details in the shadows have some printing value. It is of no use having a negative "full of detail" if the detail will not print, and the amateur beginner is too apt to forget that the negative is not the end of his work, and to go in for "pretty" negatives.

Another point where most amateurs at first go wrong is in looking upon mere density as the *summum bonum* to be aimed at. Plenty of density and freedom from fog form the qualities sought after, and a negative combining these is often said by its happy author to "let you do anything with it, it won't make a bad print." In the sense that it always gives a rich tone, whatever depth or colour it may be carried to, perhaps it is so; but, as regards gradation and general pictorial quality, the photographer himself is often the only one who does not recognise its shortcomings; and the worst of it is, that the very degree of his own satisfaction often makes it a very long time before he is willing to learn any better.

"The Sincerest Flattery."—Most of our readers are acquainted with Mr. F. M. Sutcliffe's picture, *Water Rats*, which depicts a group of nude urchins in a river. Last week, at the Newcastle Exhibition, a photograph, bearing the same title and the inscription "Copyright," which dealt with the same kind of theme as Mr. Sutcliffe's, was received for competition. Mr. Sutcliffe was one of the Judges of the Exhibition, the Committee of which, entering into the spirit of the humorous situation, arranged matters so that Mr. Sutcliffe, who was ignorant of the imitative work, saw the latter under mock melodramatic circumstances, it being specially arranged amid certain draped surroundings, &c. Mr. Sutcliffe's surprise and amusement can well be imagined. The "copyrighted" *Water Rats*, we may say, was not hung in the Exhibition.

Plurality of Prices.—Writing on the subject of the depression of the photographic business and the prospect of its revival, and our suggestion of raising prices for the highest class work, a correspondent calls attention to the fact—if fact it be—that some of the best London houses, while ostensibly maintaining their original prices, take much lower ones. Indeed, so he says, some will take almost anything rather than let a sitter go elsewhere. If this be the case—and we hope it is not—it is not the way to retain the prestige of any establishment. We were perfectly aware that some houses who work on the "coupon system" quote moderate prices, without coupons, but never expect to obtain them; in fact, so we are told, they prefer to work at the cheaper rate, as then the sitters do not expect the same class of work that they would if more was paid for it.

The Royal Academy.—The Exhibition, which will be opened in a few days, is said to be this year extra strong in sculpture. As a rule, good sculpture has a special charm with photographers. It would be exceedingly interesting to know the part that photography has played in aiding many of the artists in their work for this year's show, and how many would be bold enough to admit they had taken advantage of it. Far more there would be who would decry it, while yet they owe it much. Another point for speculation is this: Many of the pictures will be reproduced by photogravure—a "very evil thing," as it was characterised by Professor Herkomer, R.A., in a recent after-dinner speech—and it will be interesting to see what proportion of the work will be done in this country, and what proportion of it will be sent abroad for execution. Judging from past years, we fear the comparison will not be so satisfactory as one could wish.

Spring Pictures.—In our penultimate issue it was suggested to those who desired to secure spring effects that they should be on the alert to obtain them as they put in an appearance, as they promised to be of shorter duration this year than usual. Already many of the fruit trees have shed their blossom, and others will quickly follow. Why we recur to the subject is this: A few days ago we were shown some negatives of fruit trees in a magnificent state of bloom, but they were completely spoilt on account of halation. Instead of trees loaded with blossom, they had rather the appearance of being covered with snow. Had the plates been backed, the pictures would have been perfection. With some plates it is quite impossible to obtain perfect negatives of such subjects as this without backing them, and the trouble is but little good. Springtide scenes, when projected on the screen at midwinter, are exceedingly refreshing, but they can only be obtained for a very brief season, at annual intervals.

Sunday Opening of the City Exhibition.—Many who do not mind looking at fine works of art on the Sunday, when they have the opportunity, will be gratified to learn that the City Art Gallery is, after all, to be open to the public on Sundays, though only on alternate ones. In noticing the Exhibition a fortnight back, it will be remembered that we mentioned that, after an acrimonious discussion, at a meeting of the Common Council, it was decided by a very narrow majority that the Gallery should not be opened on Sundays. At the last meeting of the Council, which was an unusually large one, the subject was again brought forward, on a motion that the Exhibition be opened on alternate Sundays. Party feeling ran high, as it usually does on such occasions; but, in the end, the motion of Mr. Treloar was carried, though only by a majority of eight. Hence those who have not the opportunity of seeing the pictures on other days now have the chance of doing so on Sundays. It is gratifying also to learn that the Gallery will be kept open till eight o'clock at night during the months of May and June.

Photographing Criminals.—A paragraph, which we reproduced last week, has been going the round of the papers to the effect that a certain notorious criminal in Spain, having baffled the efforts of the officials to take his photograph, was sentenced to three months' extra imprisonment. Against this sentence the man is appealing, and the case is said to be exciting considerable interest in Spanish legal circles, it being contended that refusing to have a portrait taken does not constitute a punishable offence. Our criminals sometimes baffle the photographer, but we are not aware that there is any law by which they can be punished for it. *Apropos* of this, there is in the current number of the *Illustrated London News* an illustration showing how criminals are photographed in Siberia. The sketch, by

ius M. Price, shows the photographer with his head under the ussing cloth, and the criminal sitting before a background, th his head in an ordinary head-rest. On either side of him stand ouple of soldiers with rifles and fixed bayonets, with an officer king on. The sitter has not a very happy expression, it is true. e surroundings may have something to do with that perhaps.

Repacking Exposed Plates.—At a recent meeting of one the London suburban societies the oft-put question as to the st way to pack plates after they have been exposed, when on tour, as discussed. In the abstract it would seem that the best method ould be to repack the plates in the way they were originally put p by the manufacturers. But many who have essayed to do so on found that they have not, in the dim light of the portable ntern or a strange dark room, the deftness of the original packer in anipulating the little slips of fluted paper. In the discussion re- erred to the general opinion appeared to be in favour of packing the lates without any intervening media. This, on the whole, is per- aps the best way, while it certainly is the most convenient. The nly thing to avoid is the possibility of the films chafing against ach other. Tying them together, in dozens, with string, has been uggested. But a better plan in our hands has proved binding them ogether with broad strips of gum paper, such as the margins of heets of postage stamps. These we apply diagonally round the plates, and press the paper in close contact with the edges of the glass, so that any after-movement or chafing of the surfaces is im- possible. Instead of using gum paper we have recently tried the American sticking plaster or strapping, and find it preferable. It requires neither warming nor wetting, holds firmly, and is more easily removed than paper.

Camera Club Conference.—The following is the programme of the 1894 Conference to be held next week (Monday, April 23) at the Society of Arts, 16, John-street, Adelphi, to be opened by the President at 3 p.m.:—1. 3 p.m., Opening address by the President. 2. About 3.30 p.m., Captain Hills, R.E., *The Photographic Camera as a Portable Observatory.* 3. About 4.30 p.m., Mr. W. F. Yeames, R.A., *The Influence of Photography on Art, and Art on Photography.* 4. About 5.30 p.m., Mr. A. Pringle, *Note on the Keeping Qualities of the Modern Dry Plate.* Renewal of Conference at 8 p.m. 1. 8 p.m., Professor W. Roberts-Austen, F.R.S., *On Methods of Recording High Temperature by the Aid of Photography.* 2. About 9 p.m., Captain W. de W. Abney, C.B., R.E., F.R.S. 3. About, 9.30 p.m., Mr. A. Haddon, *On the Cause of the Fading of Albumen Prints.* Tuesday, April 24, 3 p.m., renewal of the Conference in the Theatre, Society of Arts. 1. 3 p.m., Mr. G. Davison, *The Position of Artistic Photography.* **2.** About 4 p.m., Mr. A. Mallock, *Amount of Photographic Action produced by Various Lengths of Exposure and Intensities of Light.* 3. About 5 p.m., Mr. L. E. Clift, *Notes on Photography, as applied to Process Work.* Tuesday, April, 24, 8 p.m., Exhibition of Lantern Slides in the Theatre. Special tickets for this Exhibition. Wednesday, April 25, 7.30 p.m., Annual Dinner for members and friends at the Café Monico, Piccadilly Circus.

NEWCASTLE INTERNATIONAL PHOTOGRAPHIC EXHIBITION.

The Fourth Triennial International Photographic Exhibition promoted by the Newcastle and Northern Counties Photographic Association was formally opened on Friday evening last by the Mayor of Newcastle. It will remain open till Saturday, April 28. The Exhibition is being held at the Art Gallery, Grainger-street, where three large well-lighted galleries are devoted to the exhibits, over seven hundred in number. The display of apparatus is comparatively small. In the same building is a theatre, where the lantern and other entertainments are being given.

Prior to the opening ceremony, the Annual Dinner of the Association took place, the chair being occupied by the President (Mr. J. Pattison Gibson), who was supported by the Mayor (Alderman Quin) and the Sheriff (Mr. John Goolden), the company also including Mr. W. Crooke, Mr. F. M. Sutcliffe, Mr. G. E. Thompson, Mr. J. B. Payne, Mr. E. G. Lee, Mr. Lyddell Sawyer, Mr. J. Hedley Robinson, Mr. E. J. Wall, Mr. Thomas Bedding, Mr. W. D. Welford, Mr. Jas. Brown and Mr. W. P. Brewis (Secretaries), Mr. F. K. Hurman, Mr. E. Schumann, Mr. J. Watson, and many others. Several toasts were given and responded to, and the proceedings throughout were characterised by exhilarating North-country heartiness.

There are 137 exhibitors, among whom thirty-eight medals have been distributed, and seventeen classes, several of which, in our opinion, could have been dispensed with. For instance, in the Champion division there are four classes—Landscapes, Portraits, *Genre* and Figure, and Lantern Slides. Again, in the members' division, one class is for half-plate work and above, another for 5 × 4 and under. We see no reason for such a distinction. This tendency to multiplicity of classes and profusion of medals can have but one effect, and that, in our humble opinion, a bad one. It reduces the gentle art of pot-hunting to a delightfully simple affair. It is a pity that exhibition committees and Judges cannot see that the cheapening of medals at photographic exhibitions heavily discounts their value, and casts contempt on the medal system itself.

As to the Exhibition, taken altogether, we may say that it is of that hybrid character which the adherents of the so-called "new movement" affect to despise. It contains some portrait work of the highest artistic calibre, and a great deal of the commercial kind; much that is first-rate in landscape, *genre*, and figure studies; fine examples of what can be accomplished in enlarging and instantaneous work; while the photographs of interiors, machinery, war ships at rest and in motion, bullets and torpedoes in flight, impart to the Exhibition a strong leaven of utilitarianism. The Exhibition, in short, is, so far as it goes, representative of the principal uses to which modern photography is applied, and, as such, must be pronounced exceedingly successful. It is well supported by professional photographers, and, fitly enough, considering the association of Joseph Wilson Swan with the town, includes some splendid carbon work. The Judges, in the main, did their work well, and are to be specially commended for manifestly setting their faces against recognising the over-retouched portraiture with which the Exhibition unfortunately abounds. We would just hint that the exclusion of several obviously bad examples from the walls would not have left the Exhibition appreciably weaker in numbers, and would have removed all causes of serious complaint in a qualitative sense.

The Awards.

The Judges were Mr. W. Crooke (Edinburgh), Mr. M. F. Sutcliffe, and Mr. G. E. Thompson (Liverpool), and their awards were as follows:—

Class A.—Silver medal (12), *Sweet Home*, R. Eickemeyer, jun. Silver medal (87), *Cat Bell from the Derwent*, Bernard Lintott. Bronze medal (71), *Tacking*, W. Thomas. Bronze Medal (52), *'Twirt the Gloaming and the Mirk*, J. McIntosh.

Class B.—Silver medal (95), *My Father*, R. Eickemeyer, jun. Bronze medal (111), Four Child Portraits, W. J. Byrne.

Class C.—Silver medal (282), *A Flower*, R. Eickemeyer, jun. Silver medal (261), "*Oh, Ye Tears!*" W. A. Cadby. Bronze medal (290), "*But Rose Crossed the Road*," Miss. E. J. Farnsworth.

Class D.—Silver medal (320), *Dean Stanley's Tomb—Westminster Abbey*, F. W. Edwards. Bronze medal (338), *Gwydyr Castle*, Richard Keene. Bronze medal (351), *Old Houses at Lisieux*, W. W. Stainthorpe, M.D.

Class E.—Silver medal (372), *A Speed Trial*, J. E. Goold. Silver medal (730), *Cruiser Firing Broadside*, William Parry. Bronze medal (398), *Breakers*, Charles E. Cowper.

Class F.—Silver medal (458), Portrait Enlargement on Carbon, M. and T. Scott. Bronze medal (416), *Piz-Roseg*, E. J. Garwood.

Class G.—Silver medal (470 to 475), Series of Six, W. Thomas. Bronze medal (476), Series of Eight, Abel Lewis.

Class H.—Silver medal (513), Series of Six (Tunisian), E. R. Ashton. Bronze medal (519), Series of Six, George Hankins. Bronze medal (509), *London Streets*, Charles F. Dickenson.

Class J.—Silver medal (533), Series of Six (Indian), A. W. Westtrop. Bronze medal (532), Series of Six, J. Hedley Robinson.

Class K.—Silver medal (558), *Kelp Gatherers*, W. M. Warneuke.

Class L.—Silver medal (567), Portrait of a Lady, G. C. Baker.

Class M.—Silver medal (586), *Reflections*, W. A. Cadby.

Class N.—Silver medal (594), Series of Six Flower Studies, Robert Frost.

Class O.—Silver medal (633, 634, 635), Series of Three, J. J. Kirkwood. Bronze medal (Nos. 639, 640, 641), Series of Three, W. S. Corder.

Class P.—Silver medal (647), *Holiday Time*, Parker Brewis.

Bronze medal (642B), *Sunset o'er the Tarn*, J. S. B. Bell. Bronze medal (648B), *Examining the Catch*, W. E. Cowan.

Class Q.—Silver medal (694), Series of Six, J. J. Kirkwood. Bronze medal (695), Series of Six, Parker Brewis. Bronze medal, (697), Series of Six, W. E. Cowan.

Class R.—Silver medal (700), J. Hedley Robinson. Bronze medal (701), W. H. Nixon.

The Exhibits.

In Class A (Landscapes) Mr. J. G. Bullock's five *Landscapes, Upper Delaware River*, river and woodland subject are characterised by good selection and softness of treatment, and Mr. G. B. Wood and Mr. Floyd Vail also show pleasing examples, which only want the addition of clouds to render them perfect. Mr. R. Eickemeyer has a capital series of six, for one of which he takes a silver medal. This is called *Sweet Home*. It represents a winter view of an old homestead, the footprints in the snow-covered ground, the bare trees in twilight and the whole effect being one of perfect harmony of competition, and fidelity of translation. Of this gentleman's other work we liked *After the Haul*, a carefully grouped study of fishermen on the seashore. Mr. W. Bull sends three well-exposed and printed Canadian views, showing the most meritorious arrangement of mountain and landscape. Mr. E. E. Burrows' small Alpine views are clever in a technical sense. Mr. J. G. Patterson has two views printed on warm-toned rough paper, *Fast falls the Eventide*, an old church by a wooded river, and *Stepping Stones*, a tree-shaded river view with the water tumbling over a rocky bed, both soft and poetical in treatment. Mr. James Brown has three frames, *A Hazy Morning* (a reedy-shored river bit) *Sunset* (another river scene) and *Moorland Solitude*, all of great pictorial excellence and careful handling, the latter being perfect in its suggestion of a lonely landscape. Mr. J. H. Burn's three *South African landscapes* are mere commonplace photographs, but Messrs. E. S. Baker and J. C. Oliver show fair work, and Mr. D. B. Johnstone has a series of ten small views near Edinburgh of considerable excellence. Too many of the pictures in this class have plain white skies, however. Mr. J. McIntosh takes a bronze medal for a capital photogravure of a tenderly treated evening view *'Twixt the Gloaming and the Mirk*. Mr. Jas. E. Goold has two large landscapes, one showing the mists of *Early Morning* very successfully, while the veteran worker, Mr. F. Howard, sends a series of clever landscape and figure subjects. Mr. Frost's two beautiful frost studies which we noticed at Bristol are also here. Mr. Lintott's *On the Basingstoke Canal* is of a sickly yellow tone, but otherwise is a fairly good study. Mr. Cameron Todd's three river and mountain views are marked by welcome crispness of handling. Mr. R. Keene's three frames are, as usual good, one *Evening on the Canal, Trent*, being positively delightful in its rendering of a simple theme. A bronze medal goes to Mr. W. Thomas for *Tacking*, a below-bridge study of craft, but the water has a spotty effect, and the print itself has the same defect. Please, Mr. Thomas, show us as good technique in your large as in your small work. Mr. Redmayne has a small Windermere view which he calls *A Gathering Storm*; but there's no storm gathering for all that, the picture being a placid hill and water view. Messrs. Hartley Brothers have careful landscape work introducing cattle and figures with not the best artistic effect, and of Mr. H. W. Bennett's two, commend us to a taking *Surrey Stream*, a pretty river view with swans. Mr. W. M. Warneuke failed to attract the Judges' consideration with a grand piece of work, *Returning from the Heyfield*, two female figures with bonnets looking like those worn by Mr. H. P. Robinson's models, armed with rakes, with their backs against a glorious piece of country. A silver medal is awarded to Mr. Lintott's red carbon view of *Catbell from the Derwent*, and the award was deserved. Prince C. Deb. Barma has three excellent Indian landscapes, and Mr. E. G. Lee two Derwent views not for competition, the smaller one being an extremely able rendering of a hackneyed subject.

We were glad to notice that the Portrait Class (B) was well patronised by our professional friends—indeed, throughout the whole Exhibition there is evidence that the profession would take greater interest in competitive work provided the opportunity offered. Mr. Eickemeyer obtains another silver medal for a portrait, *My Father*, a bold and forcible head, apparently untouched. Mr. G. B. Wood's portrait of *Miss Wood*, a laughing lady, is delicately treated; and he also shows a portrait of himself in a reflective attitude. Mr. James Lafayette has a grand series of exquisite portraits of beautiful dames in his best style. In one, *The Opera Box*, he portrays three handsome ladies in a box, with fans, and somewhat ungallantly gives the picture the sub-title of *The World, the Flesh, and the D—l*. We don't know which of the three is meant for the latter *rôle*. Lady Londonderry, the Duchess of Leinster, Miss Julia Neilson, the sister of the Lord Lieutenant, and other ladies are among the subjects and, if we except the inevitable tendency to over-retouch, there is nothing to find fault with in Lafayette's work on the score of artistic posing, lighting, and cultivated accessories; but the same artist's *Cupid*, a fat infant seated against a landscape, and a red carbon female figure study called *Twilight*, are rather commonplace. Mr. Draycott's Rembrandt head studies are good, and he has a meritorious red carbon study of a pretty child. Mr. W. J. Byrne's red carbon portrait studies of children well deserve their bronze medal, and his silver prints of children are quite as good as ever they were, but seem now a trifle old-fashioned. He has three large portrait studies of ladies in his best style. Mr. W. W. Winter is also well represented by large work, and we were pleased to see the honoured name of John Moffat to three frames of large portraits, one, that of Mr. J. Smart, R.S.A., being a singularly bold and able effort. Mr. W. M. Warneuke, Mr. Lafayette—with three other large figure studies of ladies—and Mr. C. M. Wane contribute to the class. The latter gentleman's efforts, printed on rough paper and apparently untouched, are very effective in texture. In the portrait head of Miss Daisy Wane we recognise the mobile model of a clever study shown at the Salon last year. We do not like Mr. Terras's two female heads; they are garish and hard. Mr. Lafayette has a frame containing several portraits of children and ladies, all gracefully posed and beautifully printed. Somehow we think there is more truth and, if we may use the term, spontaneous honesty, in Lafayette's small work than in the large. Mr. M. Auty is a prolific contributor; he sends about twenty large frames of portraits, chiefly of ladies and children, in various styles of printing. Lighting and posing are uniformly good, but we venture to think they are nearly all over-retouched. Doubtless Mr. Auty's work is popular with his charming sitters, and of its kind it is exceptionally fine. Mr. R. E. Ruddock has four large frames of coloured portraits of delightfully garbed ladies. Of the colours we can say that they are pretty, but not natural. Mr. Ruddock has posed two separate groups of three ladies into perfect pyramids, but he atones for this solecism in his remaining ten frames, some of which are distinctly excellent. But, oh, Mr. Ruddock, we wish we could persuade you, and so many of your *confrères*, to be more sparing of the retoucher's maleficent skill. Mr. Crooke, being one of the Judges, has his work hung not for competition. His large portraits of *Professor Blackie, Toole, Paderewski, J. S. Mack, Esq.*, and *Colonel Leslie, of the Cameron Highlanders*, are masterpieces, grandly posed and lighted, having a richness and depth of treatment that speak of the true artist. Mr. E. G. Brewis shows fairly good work. Mr. W. Parry has a selection of large and small examples to which praise is also due, while Messrs. B. Scott & Son, of Carlisle, are represented by some charming productions, and a clever *Dancing Girl*. The same gentlemen have a clever riverscape, *Wetheral Bridge by Moonlight*, and, in the Class for Architecture, a good interior of *Carlisle Cathedral*.

Class C, for *Genre* and Figure Studies, acquires considerable strength from the non-competitive work placed in it. Mr. Lyddel Sawyer, for example, sends many admirable and familiar specimens of his skill, notably *Nap*, *The Last Rehearsal*, *Vanity*, *Lighten our Darkness*, *Tam o' Shanter*, some views on the Tyne and at Durham, Mr. Sutcliffe (a Judge) is likewise represented by some of his Whitby work. Mr. Sandland's animal studies also figure here. We like his *Springtime*—a filly with foals. Mr. F. Whaley has an imitative attempt to reproduce the well-known picture, *The Slave*.

Mr. E. G. Lee's *At the Smithy* (a horse being shoed) and *Meditation* (a girl in a doorway in an old part of Newcastle-on-Tyne) are unpretentious themes skilfully treated. Mr. J. Martin's two studies of children are quiet in tone and otherwise good, and in *Who Broke the Window?* (a woman haranguing a group of urchins) Mr. Lee is very successful, the accusing attitude and facial expression of the woman being most convincing. The same gentleman also shows excellent small work, *Sea Urchins* and *Coming from Market* (a sheep piece), and others.

Mr. Andrew Pringle shows three figure studies—one *Eric*, representing a laughing lad; another *Gaiety*, being that which was hung in the Salon. The silver medal goes to Mr. W. A. Cadby for "*Oh, ye Tears!*" the figure of a lightly draped girl seated, with her head in her hands. This is printed in red carbon, and is full of delicate gradation. Mr. Cadby has done well to abandon bromide for his peculiarly refined style of work. Mr. Howard Esler exhibits his well-known *Peaceful Old Age: Interior of an Irish Cottage*, and has wisely printed it on a surface, instead of a rough, paper. It gains in effect immensely. There is a lot of unmistakably poor work in the class just here, in the production of which we commiserate, among others, H. O. Isaac with *Caught Napping*, an *ouvrier* of some sort asleep by his baskets. This is an atrociously ugly, inartistic thing.

Mr. Isaac can do better. Somebody sends a silly view of a small boy seated on a railing, and calls it *A Genuine Gladstonian*. Mr. A. Tibbenham, who styles himself an "artist," has a frame of three, representing a boy on *A Fishing Exhibition*, the surroundings being of an obviously property kind. In one he has "*A Bite!*" in a second he is holding up the fish—"*A Beauty!*" in the third the boy is supposed to be going home with the prey—"*Now for Dinner!*" Mr. Tibbenham may be an artist, but he is not by any means a realist. There is strong studio smack about these supposedly out-door bits. Mr. J. W. Eadie's efforts are painfully poor, his *Mending Nets and Spinning Yarns* representing a group of four men, with a wooded background, supposed to be engaged in the double occupation referred to. It is a wooden piece of work, and we learn for the first time that fishermen are in the habit of penetrating to the interior of the country for the purpose of mending their nets. Mr. Charles Sweet's five large single-figure studies are named *Memories*, *Melody*, *Psyche*, *Penelope*, and *Cassandra* (the latter three classically draped, the lady being what Mr. Joe Gargery would call a "fine figure of a woman"). Mr. Sweet's photographic work is good, but the titles of his pictures do not convey to us what he wishes to. Mr. Eickemeyer captures a silver medal for a delightful study of a seated child with *A Flower*, and also shows half a dozen other figure studies, marked by superb skill, notably the figure of a girl at *A Window Garden* (interior), *The Aquarium* (a group of children round an extemporised aquarium on a parlour table), and others. We meet Mr. Eickemeyer's work for the first time, and are delighted with its perfect technique and artistic charm. Miss E. J. Farnworth sends five specimens of her curiously refined style of figure work—*When Spring comes laughing by Vale and Hill* (a flower-decked girl in a field of blossoms); *In the West Wind Blowing* (a very delightful female figure holding some extended drapery); *But Rose crossed the Road* (a bonny lass in a sun bonnet—bronze medal); *In Upland and Pasture* (three farm women in a field). Miss Farnworth's work shows marked improvement of its kind, and is uniquely thoughtful in execution and cultivated in conception. Prince Barma and Miss Clarkson contribute to this class, the lady's *Farmer's Daughter* (a girl leaning idly on a gate, with a dog for companion and softly rendered pastoral surroundings) being, in our opinion, the most successful. Mr. G. B. Wood has about a dozen subjects, treated with wonderful ability. Of them we may instance *Boon Companions* (a man affectionately regarding a dog, who has on an old hat and a pipe in his mouth); *The Dancing Lesson* (a number of children on a pier-head dancing—a singularly crisp and lifelike study); *A Symphony in White* (a lady in a sunshade reclining in a field, the high lights on her white dress showing up with indescribably rare force and effect); an old fellow *Opening Clams; Affection* (two ladies kissing—a clever effort badly vignetted; and *A Little Contentment is Great Gain* (an old fellow, with a supremely unctuous expression of countenance, pouring something from a bottle to a glass). We have not space to name the rest of Mr. Wood's exhibits, but we must say that his work, that of Miss Farnworth, Mr. Eickemeyer, and Miss Clarkson amply compensates for a great deal of sheer trash which this class contains, and to some, but only a little, of which we have referred to as awful warnings.

The Class for Architecture (D) was a capital one. Mr. F. W. Edwards, with *Dean Stanley's Tomb*, one of four large Westminster views by which he is represented, takes the silver medal. Remarkable delicacy, softness, and gradation distinguish Mr. Charles E. Cooper's interior of the *Galilee Chapel, Durham Cathedral*, and Mr. W. S. Corder's three frames, showing Saxon crosses at Gosforth, Ruthwell, and Bewcastle, are noticeable as good photographs, and interesting archæologically. We may here remark that Newcastle and its immediate neighbourhood offers a fine field for photo-survey work, which the members of the Photographic Association might well take in hand. Mr. E. R. Bull, Mr. J. D. Darling (several of the Cathedral of the Holy Name, Chicago), Mr. R. Keene (six interiors of Gwydyr Castle), Mr. H. W. Bennett, and Mr. C. H. Oakden figure worthily in the class, and Mr. J. H. Gear has a representation of *The Confessor's Shrine, Westminster Abbey*, which is marred by a degree of haziness almost amounting to light fog. Dr. W. W. Stainthorpe, with a frame showing *Old Houses at Lisieux* and *St. Pierre, Lisieux*, wins a bronze medal. They are careful little views of old-world architecture, full of technical excellence allied with artistic beauty. Before we quit this class, we observe that, not only here, but elsewhere, halation in interior work seems to have practically disappeared. A few years ago the defect was more or less common, even in first-rate exhibition work.

There are noticeable pieces of good work in the Instantaneous Class (E). Mr. Charles Sweet's yacht studies are as good as this kind of thing can be made. Interest, however, will chiefly centre in some remarkable work sent by Mr. J. E. Goold. He shows a series of four photographs of a torpedo in its flight, taken to show the angle it struck and entered the water, and the curve it made during its flight. One represents a first round, and shows the end of the torpedo scarcely clear of the tube. The others are all of one torpedo, taken between the time it left the gun and reached the water, a distance of thirty-two feet. The torpedo was travelling at fifty feet per second, and thus there was only half a second in which to accomplish the three exposures. The torpedo starts in a horizontal line, and gradually takes an angle similar to a man diving. The photographs are marvels of good definition and accurate exposure.

Quite as interesting, doubtless, will be Mr. Goold's series of rifle bullets taken during their flight. These were taken by the electric spark, which throws a shadow of the bullet on the plate. The air waves are clearly shown in front of and behind the bullets. The two first are of bullets shot from a special magazine rifle, made by Messrs. Pape, which gives a very high velocity. In all three the fused metal is seen flying in all directions, and in the second print the bullet has deflected, and the point at which this commenced can be traced on the air wave. The first two bullets are travelling at a velocity of about 2000 feet per second, and the third is from a Martini-Henri rifle, travelling at about 1500 feet per second. In this it will be seen that the air waves are straighter up and down, owing to the velocity being lower. The fourth represents a sheet of glass just pierced by a bullet. The glass has not had time to fall, although it was shattered into atoms. This photograph shows the shadows and series of reflections, proving how much the glass must have bent before giving way. The white spots are caused by the fused metal and bits of wax striking and sticking to the plate.

Mr. Goold's work is entitled to rank with that of Vernon Boys and Professor Mach, than which we can give no higher praise. He also exhibits a number of views of war ships under steam, all of great excellence, for one of which, *A Speed Trial*, he takes the silver medal. A bronze goes to Mr. W. Parry for a similar subject, and one to Mr. C. E. Cooper for a wave piece, *Breakers*, a study in blue carbon. Mr. Gottleib, Mr. H. W. Bennett, and Mr. J. E. Dumont show good marine and yacht pieces, and Mr. G. H. Wood sends a series of sky studies which deserve mention. Mr. Byrne's *Richmond Horse Show* series is in the class. There are also attempts at humour in the way of dogs, chickens, &c., by Mr. Gottleib, Mr. Redmayne, and Mr. Wood, which entirely miss their mark, while Mr. C. Donovan, with two Brighton beach views, is entitled to recognition as being the producer of the worst photograph in the class.

Of the work shown in Class F (Enlargements), four enlargements from snap-shots of yachts, by Mr. W. M. Harrison, struck us as attesting the sharpness of the originals. Mr. T. O. Mawson has a good view of a derelict craft, *Abandoned*, and other excellent specimens are sent by Messrs. Maddison & Hinde (a large unworked head), Mr. G. Franks (a child's head), Mr. Bulmer (*Evening on the Weir—Lumley Castle*), Messrs. Scott & Sons, Mr. Auty, and Mr. Ruddock (enlarged portraits). Unquestionably the finest exhibit in the class is that of Messrs. M. & T. Scott (Edinburgh). These gentlemen send half a dozen extremely good carbon portrait enlargements, for one of which, that of a lady, they deservedly take a silver medal. This is of a peculiarly warm brown tone, unlike any carbon tissue that we have hitherto seen, and, as an enlargement, is a technically sound and clever piece of work.

Hand-camera work monopolises Class G, the silver medal being awarded to Mr. W. Thomas for some of his river views. Mr. John Moffatt contributes to the class, and Mr. Charles Job's agricultural series are interesting and good. Mr. V. L. Alexander's series of yachting on the Clyde betray careful workmanship, and Mr. Abel Lewis's sea and pastoral studies are admirable. Mr. W. E. Cowan cleverly depicts street scenes in Newcastle, a vein which Mr. E. G. Lee also taps in his well-known able manner. Mr. E. M. Stone's *Views of Filey, Lowestoft*, &c., are well exposed and printed views, while Mr. Lintott's landscapes are so good that it is difficult to believe that they were taken in a hand camera, the subjects embracing evening as well as sunlight effects. The class is disfigured by a dozen or so yellowed prints and views and groups by Mr. Redmayne, which one would expect from an absolute novice in hand-camera work.

The medal in the Landscape Class of the Champion Division goes to Mr. W. M. Warneuke for his *Kelp-gatherers*, against which the most noteworthy works that were pitted were Lintott's *On the Top of the Tide* and *On the Derwent*, Webster's *When the Evening Sun is Low*, and the winner's *In the Meadow* and *At the Well*. The class, however, was not a strong one, any more than was L (Portraits), where Warneuke's well-known portraits of *J. L. Toole* and *Ethel* had to succumb to a *Portrait of a Lady*, by G. C. Baker, which secured

the silver medal. This is a small work depicting the subject in full face, having perfect modelling and striking lighting, and being altogether unconventional in effect, particularly as regards the background, which has a not too obtrusive floral pattern. There was a keener contest in Class M (*Genre* and Figure Studies), wherein some distinctly clever work is to be found. Mr. Cadby's *Reflections* obtains the silver medal. Mr. R. Eickemeyer has some delightful figure studies in the class, the subjects being: *As She Comes Down the Stairs, The Way Through the Wood,* an old fellow giving himself *A Good Shave,* and a lady in a boat—*The Lily-gatherer.* Presumably printed in platinum, the tone obtained is a remarkably pleasing black, while throughout this exhibitor's work there is, as it were, a nicety of touch combined with the purest treatment, which mark him out as the possessor of deep artistic instincts. We hope his work will ere long be seen in London. Mr. J. E. Dumont's *The Proposal* (a good rendering of the old subject), and examples by Miss Farnsworth, R. Terras (*A Holiday Morning*), C. S. Roe (*The Sedge-gatherers*), D. J. Scott (*Dividing the Spoil*), and others make up a capital little class, which must have given the Judges some trouble. In two classes of the Members' division Messrs. Snowball, Parker Brewis, F. Croft, W. H. Thorne, W. S. Corder, F. Park, J. J. Kirkwood, J. S. B. Bell, and W. E. Cowan exhibited work of a singularly even nature in point of merit.

Classes H and Q were devoted to Lantern Slides, open and members. The awards will be found above. In the first-named Messrs. Gear, C. F. Dickinson, E. R. Ashton, Hankins, and E. G. Lee were prominent. In Class I (Stereoscopic Transparencies, open) Mr. A. Westrop came first with an Indian series, but our preference was for Mr. J. Hedley Robinson's set of landscapes, &c. All the exhibits, however, were extremely good, Mr. Frank Howard, Mr. J. E. Ellam, Mr. J. H. Spencer, and Dr. Stainthorpe competing. In the Members' Stereoscopic Transparency Class (R) Mr. Hedley Robinson was easily first, Mr. W. H. Nixon winning the bronze medal.

In the non-competitive section of the Exhibition, the Autotype Company are represented by some fine autogravures and autototype enlargements; Herr R. Paulussen sends a set of photogravures from Mr. Tagliaferro's negatives; the Stereoscopic Company show specimens of photo-mezzotype, and there are a number of exquisite photogravures from Mr. Pattison Gibson's negatives of Bamborough Castle and other places, to illustrate a county history in course of publication. Lastly, we must not omit mention of what perhaps constitutes the gem of the Exhibition—a large portrait of a lady by Mr. W. Crooke, having an almost *spirituelle* softness and delicacy, and remarkably even lighting.

In the Apparatus Section Messrs. F. K. Hurman & Co., of St. Nicholas-buildings, Newcastle, showed some large studio cameras, which they make a speciality. These are well finished and handsomely made instruments, having all the movements desirable for studio work.

Mr. John Watson, of 34, Grainger-street, also has a good assortment of well-selected photographic apparatus on view, including his "Norway" hand camera, &c.

HALF-TONE ENGRAVINGS *VERSUS* PHOTOGRAVURES.

Readers of *Paper and Press* (says that Journal) are all familiar with the admirable work in colour which was accomplished by J. E. Earhart, in *The Colour Printer*, a work which reflected the most superb taste in colour combination and contrast, and which gave forth means and methods of great value to all printers. Mr. Earhart has now aimed in another direction, with what success it must be left to individual judgment to determine, and has just patented a new process of making relief plates in half-tone, his object being to render the resultant prints as soft and delicate as a photograph or photogravure, and consequently much superior to ordinary process pictures. Whether his method is not too lengthy for profitable commercial practice is a question; his manner of effecting the result will undoubtedly do all that he claims for it, provided sufficient skill is possessed by the manipulator, for upon that depends the success of the entire process.

He employs two or more plates for producing a single picture, the first being the original plate, and the balance being shadow plates to give the different values of the finished print, which are treated by over-etching.

Having obtained his plate with the picture photographed upon it, either from a positive or negative, and having gotten his etching, he proceeds further. Using his own illustration, let us suppose that he has a landscape to reproduce, embodying a reservoir of water, a pumping station adjacent, a river, distant hills and sky, for the adequate presentation of which three relief plates will be necessary. He makes three etchings of the subject, all alike. The first is etched, as ordinarily; the second plate is etched until all delicate parts are eaten away, the sky, hills, and the reflections in the water having disappeared, and the dark tones and extreme edges of all masses in the middle distances having been materially softened. Thus the first shadow plate is made. A still longer etching is given the second shadow plate, and the entire middle distance is etched away, and nothing left of the picture but the deep shadows and dark objects in the immediate foreground, such as the trees at the sides of the picture and the near shrubbery, the extreme edges of these remaining objects being also toned down by the etching. Although the acid has attacked all lines alike in these two shadow plates, yet it has destroyed those lines only which are relatively fine or narrow, and the plates, in consequence, have a large side surface in proportion to their upper surface. In this respect, Mr. Earhart says that the acid acts as a tool, automatically and unerringly removing the very parts not needed, thus taking the place of a "scraper" or similar device used by engravers for lowering those portions of the plate which are not to be printed from. Not only is this true, but he claims that the over-etching process affords a soft and delicate outline giving a gradual blending of all the tints in the printed picture.

After the original plate and the shadow plates have been mounted upon blocks, the desired number of impressions are first taken from the original plate, the ink used for this purpose being of a light tint, to give the proper aerial perspective to the sky and distant hills; when these impressions are dry, the first shadow plate is brought into service. Here a deeper-toned ink is employed, for the purpose of strengthening the middle distance, and, after the second printing is dry, the final shadow plate is printed from, the ink for this last impression being materially darker than any previously applied, so as to bring out the foreground trees and shrubbery very strongly and distinctly. The sky, distant hills, reflections in the water, and in fact all the light tones, being the only portions visible that were printed from the original plate, the middle distance shows this first impression with the second printing imposed over it, and the foreground exhibits an unusual depth of colour due to all the near objects having received three separate impressions. Hence the sky and extreme distance are light and airy, the middle distance more distinct, and the foreground sharp and well defined, which blending or gradation of tint is effected without blurring or confusion, on account of the perfect registry occasioned by all the plates being made from a single photographic positive or negative. In some cases different coloured inks are used with the various plates, or three or more "shadow plates" with a single "original" are employed.

REVIEW OF THE THEORY AND USE OF COPPER SALTS IN PHOTOGRAPHY.*

III.—Positive Printing Processes on Copper Plates.

From what has been already said about the photo-chemistry of copper compounds, it will not be surprising that early advantage should have been taken of the sensitiveness to light of the haloid cuprous salts for the production of positive pictures.

In 1841 Fox Talbot took out a patent for a process by which copper plates, coated with haloid cuprous salts, by exposure to the vapour of chlorine, bromine, or iodine, could be impressed with a photographic image, and developed with sulphuretted hydrogen.* Later, Salmon and Garnier sensitised copper plates with cuprous iodide, and, after exposure beneath a transparency, varying from ten minutes to two hours, rubbed the plate with cotton-wool impregnated with mercury.† The mercury attaches itself to those parts which have been affected by light. Black greasy ink is then rubbed in, and adheres only to the parts free from mercury. The ink is hardened by dusting on resin, and the plate is then etched with silver nitrate and nitric acid. Plates coated with cuprous salts can also be developed by mercury vapour, in a manner similar to the Daguerreotype process, as described by Fox Talbot in 1841, and later by Schultz-Sellack.‡

Efforts have been repeatedly made to produce positive pictures on copper without development. Such a result has important applications in simplifying the work of the engraver. To sensitise the copper plate, it is only necessary to place it in an acid solution of haloid cupric salt, or expose it to the vapour of a haloid acid; but plates coated with cuprous chloride or iodide cannot easily be fixed after exposure. Plates coated with cuprous bromide, however, can be fixed in sodium hyposulphite, or chloride, while Renault states that plates sensitised with cuprous iodide, and treated after exposure with weak mercuric nitrate and ammonium sulphate, become brick-red on the unexposed parts, while the exposed parts take up the colour of mercurous iodide.§ Presence of moisture in all cases increases the sensitiveness of the cuprous salt.

We come next to the copper etching process described by Obernetter. In this case an ordinary glass negative is placed in a solution

* *Abridgments of Specifications relating to Photography,* 1861, i. p. 4.
† *Ding. Poly. Journ.*, v. 136.
‡ *Phot. Archiv.*, 1872, p. 262.
§ *Phot. Mitth.*, 1864, i. p. 147.

* Continued from page 218.

of ferric chloride and chromic acid, whereby the silver image is altered to silver chloride. It is then placed in contact with a copper plate, whereby the silver chloride is decomposed by the copper on the application of a weak galvanic current, as follows:—

$$Cu + 2AgCl = CuCl_2 + 2Ag.$$

Thus, the copper plate is etched in a degree corresponding to the thickness of the deposit of silver chloride in the negative.

Copper plates may also be sensitised with asphalt, dissolved in turpentine; but processes based upon the action of light upon asphalt do not properly come within the scope of the present article.

The number of different mordants which can be used for copper etching is too numerous to mention here. A complete list of the more important of these has already been given by Waterhouse,* as well as other details connected with the photo-etching of copper plates.

IV.—Positive Pictures on Paper with Copper Salts.

Renault observed, in 1868, that cupric chloride dissolved in collodion and spread on paper, gave positive pictures when exposed beneath a negative, if damped from the back. Balsamo had previously described, in 1862, a method of coating paper with a solution containing hydrochloric acid, phosphorus, and copper acetate. After exposure, the picture was developed with sulphuretted hydrogen, and fixed with bismuth nitrate. Hunt's Chromotype process dates from 1843.† He sensitised paper with one drachm of copper sulphate, dissolved in one ounce of water, to which was added half an ounce of a saturated solution of potassium bichromate. When dry, the paper keeps for any length of time. On exposure to sunshine beneath a negative, a dull brown negative picture is first seen. This soon becomes a positive yellow picture on a white ground. On developing with a solution of silver nitrate, a positive picture, described as of great beauty, results. To fix the picture, the silver nitrate must be removed by washing in pure water; but, if any chloride is present, the image bleaches, reviving in bright sunshine, and changing from its original red colour to lilac.

Burnett's cuprotype process somewhat resembles the above, the development being effected by potassium ferrocyanide, and fixing in ferrous sulphate.‡

The following modification of Hunt's process has been described.§ If neutral potassium chromate is added to copper sulphate, a copious brown precipitate of copper chromate is obtained. This precipitate, washed and dissolved in dilute sulphuric acid, forms a yellow solution, which is spread on paper. On exposure the paper bleaches in the exposed parts, and the image is developed in bicarbonate of soda, by which all the shadows are given in copper bichromate. Development may also be effected with silver or mercuric nitrate.

The chemistry of this process has been described by Eder.‖ The copper chromate is decomposed by light, so that silver nitrate forms red silver chromate on the unexposed parts only, giving a positive picture in red. The presence of chlorides in the washing water changes the silver chromate to silver chloride, thus bleaching the image. Exposure to light darkens the silver chloride, and the picture reappears in violet. The red silver chromate could be blackened by conversion into sulphide.

Perhaps the only copper printing process which, up to the present, has yielded useful results is that of J. B. Obernetter, first described in 1864. A mixture of cupric chloride and ferric chloride, acidified with weak hydrochloric acid, is spread on paper and dried in the dark. On exposure the ferric chloride is reduced to ferrous chloride. The image must be fixed immediately in a bath of potassium sulphocyanide, in which the ferrous chloride reduces the copper salt to cuprous sulphocyanide, which remains as a white deposit upon the exposed parts. This white copper salt is afterwards toned in either of the three following ways:—

1. Potassium ferricyanide changes the white cuprous sulphocyanide to red copper ferrocyanide, which becomes violet to black when treated with ferrous sulphate, to which forty per cent. of ferric chloride has been added, owing to the formation of Turnbull's blue. Lead acetate also gives a very fine purple violet.

2. Ammoniacal potassium permanganate gives a brown picture consisting of manganese oxide.

3. Silver nitrate deposits metallic silver on the picture. Finished in either of these ways, the prints may be floated on albumen and made to resemble ordinary silver prints.* Very fine results have been obtained by this process, but it has never come into general use, one great drawback being the rapid fading of the image if not placed in the sulphocyanide bath soon after exposure. The sensitised paper keeps indefinitely before exposure. J. Vincent Elsden.

(To be continued.)

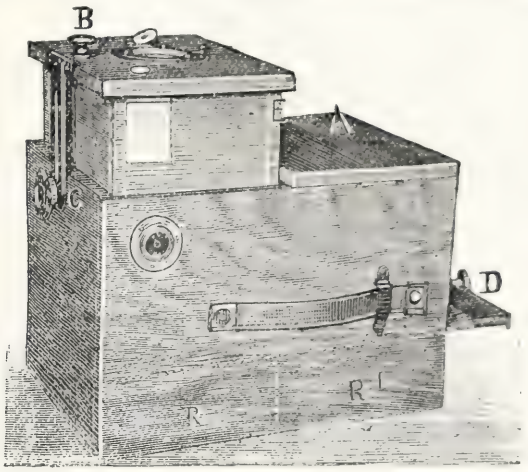
* See *Photographic News*, xxvi. p. 246.
† *Ding. Poly. Journ.*, xc. 413.
‡ *Journ. Phot. Soc. Lond.*, 1857, p. 21.
§ *Photographic News*, ii. p. 114.
Ausf. Handbuch der Phot., 4th part, p. 246.

Our Editorial Table.

Gotz's "Paragon" Magazine Hand Camera.

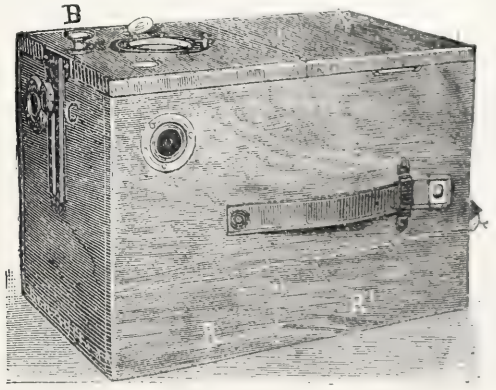
This instrument has some novel features, notably in the way the plates are changed and brought into focus behind the lens. It consists of a box about 8 × 5 inches, and is divided into three compartments. The first contains the lens, shutter, diaphragms, finders, &c., and, in fact, all the appliances of the camera proper.

The lens is a Suter 4¾ or 5 in. rapid aplanatic, provided with iris diaphragms, which by an ingenious arrangement can be set from the



outside. The shutter can be regulated to speeds varying from the one-hundredth of a second to one second. It passes through the optical centre of the lens, and is provided with a plate which protects the sensitive surface from light during the operation of setting.

The second compartment contains the plates, and has accommodation for twenty; but for films in carriers the number of exposures may be increased to thirty-six or forty. From this compartment plates or films, as the case may be, are pushed into the chamber for exposure, the camera proper, an indicator showing at every change of plate the number of the one in focus. Changing the plate, it is effected on drawing out the division, the exposed plate is caused to



fall into the well underneath, forming the third compartment, and a fresh plate is brought into the focal plane, when the division is pushed home.

A peculiarity of the instrument is that the plates are not, as is usual, pressed into focus from behind, but are held by two springs acting on the rebates or margins of the carriers.

The whole machine is well finished, and has the stamp of perfect workmanship which we should expect of an apparatus coming from the hands of Mr. Gotz. The camera should be in great demand during this and forthcoming seasons.

* Full details of this process are given in The British Journal Photographic Almanac, 1889, p. 365

News and Notes.

PATENT OFFICE LIBRARY.—The number of readers during the week ending April 14, 1894, was 2330.

MESSRS. ARTHUR SCHWARZ & Co., of Dashwood House, E.C., have sent us specimen prints on Dr. Hezekiel's grain platinum paper. The effects obtained are of a highly artistic engraving-like character.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. — Technical Meeting, April 24, at 50, Great Russell-street, at eight p.m.—*Recent Experiences in Photogravure.* Mr. Horace Wilmer will introduce the subject and give a demonstration.

BEFORE his return from Germany, Professor George E. Hale will visit Mount Etna to make experiments in photographing the corona of the sun. He plans to reach the mountain about May 15. Mr. Hale's persistent endeavours to discover some way to photograph the corona in full sunlight will, we believe, be rewarded with success before long.

MR. M. E. BANGER writes: "In my letter, dated April 4, published in your last number, you have omitted the word 'scientific' in the concluding paragraph. The sentence in question should read: 'As if the term *perfect*, when applied to such an essentially photographic production as a negative, *scientific* or otherwise, could have any meaning *artistically*.'"

A NOVEL PHOTOGRAPHIC COMPETITION.—*Science Siftings* is organizing a photographic competition, which the paper thus describes: "It is our desire to ascertain from a *plébiscite* of our readers the names of the most popular manufacturers of photographic specialities, so that all may be able to judge whose are the most excellent materials, &c. We offer, therefore, two prizes of two guineas and one guinea respectively, to those competitors whose lists are nearest in accord with the general consensus of opinion. The following are the specialities to which competitors are invited to prefix the names of their favourite makers: Lenses, dry plates, hand cameras, shutters, printing papers, developers. Competitors may send in as many lists as they please, but each list must be accompanied by the coupon appearing on the back cover. The latest date for receipt of the lists is Monday, May 14."

THE Croydon Camera Club's Annual Dinner was held on April 11 at the Greyhound, the President (Mr. Hector Maclean, F.G.S.) in the chair. "Prosperity to the Club" was proposed by Mr. Charles W. Hastings and responded to by Mr. Maclean, who in the course of his remarks touched upon a large number of matters of interest, alike to members and to photographers at large. He stated that during the past winter the members had between them shown no less than 600 of their *own* photographic lantern slides at the public displays held at the Braithwaite Hall, which had been patronised by over a thousand of their townsfolk; he also alluded in deprecatory terms to those who seek to popularise a style of photography described as "Shadow and Smudge." Other speakers were Mr. John H. Gear (whose opinions on various matters photographic were much relished), Mr. J. Packham, and Mr. H. E. Holland, who, in the absence of Mr. G. R. White, responded on behalf of the Hon. Secretaries. The music included songs by Messrs. G. Paice, W. C. Phillips, J. Smith, J. H. Gear, H. Maclean, and H. E. Holland, specially good being the finely rendered ballads contributed by Messrs. Gear and Paice. Amongst other notable faces we noticed were those of Messrs. W. Wreford, J. Noakes, J. Bown, E. Burroughs, W. Fenton Frost, and A. Durk. The piano was in the able hands of Mr. W. A. Dunn.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of Delegates, Wednesday, April 11, at 50, Great Russell-street, Mr. E. Clifton (Photographic Club) in the chair.—The Secretary announced that, in accordance with the resolution passed at the last meeting, the defaulting Society had been struck off the list of Societies; also that the lectures upon colour photography had been duly arranged, and full particulars would be published in the photographic papers, or could be obtained from him. A letter was read from the Hon. Secretary of the Leytonstone Camera Club, criticising the work of the Committee. In reply to Mr. Oakden (South London Photographic Society), the Secretary stated that the delegates of the Leytonstone Camera Club, in the past year, had only attended one meeting each. Dr. Turner (Leytonstone Camera Club), in the course of some remarks upon the previous work of the Affiliation, said he did not endorse the tone of the letter. A letter was read from the Hon. Secretary of the Hackney Photographic Society, also commenting upon the work of the Affiliation. Mr. P. Everitt (London and Provincial Photographic Association) said that, while the letters contained a certain amount of truth, they could not but be very much disgusted with the manner in which the truth was put before them. The Chairman remarked that he thought more meetings should be held, but the Affiliation had suffered through the unfortunate death of Mr. Bedford, the first Chairman, and the illness of Mr. Pringle, his successor. It was agreed that the letters should be acknowledged, and the writers informed that they had been fully considered. Mr. Everitt remarked that he thought that greater concessions to members of affiliated Societies in the direction of wall space should be made. A delegate suggested that a certain number of free tickets to the Photographic Exhibition should be supplied to each affiliated Society. Mr. F. Brocas (Holborn Camera Club) pointed out that, so far, the Photographic Society of Great Britain had done all they had originally promised to do, and very much more. It remained with the delegates to decide what they were to do themselves. The Secretary remarked that the complaints were that the Affiliation did not do enough for the Societies, and the delegates had met that, not by doing anything more themselves, but by asking the Photographic Society of Great Britain to do more for them. In his opinion, the severest comment that could be made upon their action was the balance-sheet itself, which showed that they were not able to dispose usefully of the funds they received, a comparatively large balance being carried over from the last year. A long and desultory discussion ensued as to whether an executive should be appointed, or whether the work should be done by the whole Committee of Delegates, the latter course being that finally adopted. It was decided that, in future, the Committee of Delegates should meet upon the second Wednesday in every month; that delegates having any matter to bring forward should give the Secretary due notice of the same, and that then notices of the matter for consideration should be given, if the editors will permit, through the medium of the photographic press; and that all communications upon matters connected with the Affiliation should be made to the delegates, and not to the Secretaries of the Societies.

CLOUD LORE.—Once a year the Royal Meteorological Society, like most other scientific bodies, holds an exhibition of the results of its studies so far as they can be rendered into a visible and tangible form, and brings together an interesting collection of the tools and instruments with which the meteorologist works. It has been doing this now for thirteen years, and each annual exhibition concerns some special department of the science of weather. The exhibition of instruments, photographs, and drawings which was opened at the rooms of the Institution of Civil Engineers, 25, Great George-street, Westminster, last week, relates to cloud representation and measurement. It is surprising what an extensive variety of instruments are now in use for observing the motion, form, and altitude of clouds. There are simple circular mirrors engraved with lines representing the points of the compass, in which the masses of vapour floating across the sky can be watched and examined with ease. Next we have a more elaborate form, mounted on a compass needle, and so on until we arrive at the complex and accurate instruments of Finneman, General Strachey, and F. Galton. A deal of work is done at Kew in the matter of cloud observation by means of sets of sky cameras placed half a mile apart, but connected electrically, so as to give a record of the speed of particular clouds. The difficulties in sky photography caused by excess of light are obviated by mirrors or yellow-glass shutters. A very ingenious camera for this purpose has been devised by Mr. A. W. Clayden, F.R.Met.Soc., which is on view, together with the De Bort and Raymond photographic theodolite for measuring the height of clouds. An interesting set of home-made hygrometers and evaporators for testing the dew point and the amount of water vapour in the air are shown as the work of Mr. Hainby, an Isle of Wight shoemaker, who is a devoted student of meteorology. Some of the methods employed are original and ingenious. As this is a "cloud" exhibition, anemometers are rather out of place, but space is reserved for a highly elaborate one by Dines, which not only exhibits the velocity of the wind at sight, but registers the pressure of velocity. But to the lay visitor the grand series of meteorological photographs on view will be inspected with more interest. Professor Meldola, F.R.S., recently threw out a hint to the amateur photographer that, instead of firing off his camera promiscuously at any object that attracted his attention, he should turn it to some useful account by making permanent records of notable natural phenomena. The meteorologists would, doubtless, be glad of cloud phenomena, lightning flashes, and so forth, for they apparently learn a great deal from such sources. The cloud photographs now on show in Great George-street are extremely beautiful pictures, quite apart from their scientific value. There are some grand views, taken by M. Paul Garnier at the Boulogne-sur-Seine Observatory, and others of equal interest by Mr. Birt Acres, which give in order the characteristic forms, accompanied by a note setting forth the sort of weather they generally prognosticate. Sets of these would be extremely useful for distribution amongst the fishing villages along our coasts. One view shows a Dakota "cyclone" travelling in its funnel shape across the country. The lightning photographs are vivid and wonderful pictures, and there are some astonishing scenes of hailstone clouds and allied phenomena. The Krakatoa dust has not yet been laid to rest amongst meteorologists, for we get some beautiful water-colour sketches of "after-glows," and in particular a set of diagrams representing Krakatoa volcanic dust, collected by Mr. W. F. Stanley 1000 miles from the eruption, and magnified 4000 diameters, embracing bubbles of scoriæ, chips of obsidian, and other flinty substances.—*Daily Chronicle.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5860.—"Improvements in Instantaneous or Time Shutters for Photographic Cameras." A. J. BUNCHER.—*Dated April*, 1894.

No. 5971.—"Improvements in Apparatus for the Use of the Electric Light for Photographic Purposes." Complete specification. A. G. ADAMSON.—*Dated April*, 1894.

No. 5972.—"Improved Changing Box for Photographic Cameras." W. CUTHBERTSON.—*Dated April*, 1894.

No. 6043.—"Improvements in Cameras for Photographic Purposes." S. J. MURPHY.—*Dated April*, 1894.

No. 6994.—"A Photographic Magazine Camera." I. CARRUTHERS.—*Dated April*, 1894.

No. 7006.—"Improvements in Photographic Dark-room Lamps." J. H. SPENCER.—*Dated April*, 1894.

No. 7052.—"Improvements in Stands or Supports for Photographic Cameras." M. MCKAY.—*Dated April*, 1894.

No. 7085.—"Improvements in Photographic Cameras." H. SHIELDS.—*Dated April*, 1894.

No. 7125.—"Improvements in Portable Boxes for Photographers." Complete specification. A. D. FITZRANDOLPH.—*Dated April*, 1894.

No. 7136.—"Improvements in Stereopticons or Magic Lanterns." Communicated by E. Hudson. H. H. LAKE.—*Dated April*, 1894.

No. 7157.—"Improvements in Photographic Cameras." H. RANSOM.—*Dated April*, 1894.

No. 7278.—"A New Photographic Show-card for Advertising Purposes." T. J. FOSTER.—*Dated April*, 1894.

No. 7398.—"An Improvement in Photographic-shutter Apparatus." Communicated by F. H. Kelly. THE EUROPEAN BLAIR CAMERA COMPANY, LIMITED. —*Dated April*, 1894.

No. 7450.—"Improvements in Film-changing Photographic Cameras." J. T. CLARKE.—*Dated April*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN HAND CAMERAS FOR PHOTOGRAPHIC PURPOSES.

(A communication by Alois Delug, 6, Neureutherstrasse, Munich, Germany.)

No. 14,045. WILLIAM PHILLIPS THOMPSON, F.C.S., M.I.M.E., 6, Lord-street, Liverpool, and 6, Bank-street, Manchester, both in the County of Lancaster, and 323, High Holborn, Middlesex.—*March* 10, 1894.

THIS invention has for its object to produce an apparatus or camera for photographic purposes, which, by means of a single handle, will automatically perform every necessary preparation for taking a photograph, such as adjusting a new sensitised film for exposure, releasing the shutter, and the various other operations.

Such an apparatus as the foregoing will be particularly of great advantage in the case of instantaneously photographing moving objects, as, owing to the amount of handling necessary for taking instantaneous photographs with the ordinary apparatus, very frequently the best or most favourable moment for a successful shot is lost.

This improved camera consists of two or more cases adjustable one in another.

This arrangement may, of course, be modified by merely using a bellows, which can be automatically fixed after the apparatus has reached a predetermined position. The parts may be guided into their correct position by means of hinged bars, or by lazy tongs, or by any other suitable means. It is also quite immaterial whether the lenses be moved forward or the picture surface be moved backwards.

For the purposes of the present description it is assumed that the parts are adjustable one in another; the fixing of each separate part, when the camera is expanded, may be done by means of stop catches, stop springs, or the like, fitted to the sides of the parts.

These stop springs will spring out of their recesses when the camera is fully expanded, and press against the parts lying behind or below them, which parts will then be held in their proper position. This process is accompanied by an audible snapping, which simultaneously indicates that the camera has been fully expanded, and that all the steps hereinafter described necessary for taking a photograph have been completed, the camera being therefore, to a certain extent, ready for a "shot."

The lens shutter is not directly attached to the front of the camera, but stands somewhat back from the front on a partition which is connected with the actual front wall by means of suitably covered-in parts so as to perfectly exclude the outside light from the inner chamber of the camera. The lens is inserted in a sheath or holder arranged in the front wall of the camera.

The aforesaid partition to which the shutter is attached is connected by means of a bellows with a similar partition situated in the rear part of the camera. This partition No. 2, by means of an opening, only shows so much of the film (corresponding to the size of the picture which is to be taken) as is to be exposed. The exposure of the remainder of the film to the light is entirely prevented by means of the aforesaid bellows.

The roller containing the film or sensitised paper is arranged in the part of the camera at the side of the lens. From this roller the film passes over two easily revolved rollers, bars, or the like, suitably attached to the partition No. 2 of the camera, close to the opening, and thence to the receiving roller.

The arrangement and mode of working of the delivering and receiving rollers are as follows:—

Both rollers have cord pulleys, and are connected by means of a cord in such a way that they will rotate in opposite directions to each other. In order to maintain the mutual tension of the same, the delivering roller is arranged on springs, and is borne in suitable hinged stirrups attached to the bottom and top of the camera, the first of these stirrups being constantly held down by a spring. Both stirrups are firmly connected by means of a crossbar, the result of which is that the pull exerted by the spring on the first stirrup is also conveyed to the second stirrup, and thus both always stand parallel. The delivering roller may be revolved in either direction, according to whichever way the aforesaid cord is drawn.

The receiving roller is arranged in the following manner:—

The roller consists of a holder, on which the exposed film is wound, and it has two flanges preventing the film from slipping off. One of these flanges is provided, on its circumference, with inclined teeth, with which a pawl constantly engages by means of a spring; this ratchet wheel or the holder can therefore only turn in one direction, for instance, to the right, and it is prevented revolving in the opposite direction by the pawl. The flange forming the ratchet wheel has on its outer side one of the aforesaid cord pulleys, and on its inner side, facing the holder, there is a second pawl acting in an opposed direction to the first pawl. This receiving roller revolves on an axis fixed in the bottom and top of the camera in such a way that both may be moved independently. A spiral spring is fastened at one end of this axis, this spring being contained in a suitable casing or drum. The lower end of the axis has, before it emerges from the casing or drum, a small ratchet wheel in which the pawl No. 2 attached to the flange engages. A further cord pulley is also attached to this end, over which pulley a cord, band, or the like passes, this latter being attached to the side of the camera at a suitable point, and this cord being wound up when the camera is folded up.

If then the camera be expanded for the purpose of taking a photograph, the spiral spring at the end of the axis is drawn up by the cord fastened in the rear part of the camera, and the film is simultaneously unwound by the delivering roller. The receiving roller remains meanwhile stationary, its rotation being prevented by the pawl No. 1; on the drawing out of the camera, the shutter is at the same time raised by means of a cord, as will be hereinafter described, and also the marking device, which is also more particularly described further on, comes into a position away from the film. When the exposure has taken place, the camera is folded up; the spiral spring coming into play, the axis is compulsorily connected with the holder by the action of the aforesaid small ratchet wheel and pawl, and the receiving roller takes up a portion of the film. As the delivering roller is connected with the receiving roller by a running cord, the latter also revolves, but in an opposite direction, and thus takes up a portion of the film.

When the camera is folded up, the marking device hereinbefore mentioned will then come into action. This exactly determines the limit between the separate pictures or impressions, and thus considerably facilitates the exact cutting off of the pictures. This marking device is arranged in such a way that in the bottom and cover of the rear part of the camera, at the sides of the partition No. 2, two revolving angle pieces are arranged, which are connected by means of a clasp carrying the separate marking pins. When the camera is expanded, this marking device is pressed by a spring away from the film against the back wall of the camera; on the shutting up of the camera, however, the front part encounters the angle pieces, causing these to revolve, and the marking pins penetrate into the film.

The shutter employed with this camera is arranged in the following manner:—

A hinged or revolving plate is arranged in front of the objective opening, which plate is usually pressed against a pin by the action of a spiral spring, No. 1, and thus the opening of the objective is kept closed. On this plate a flat spring is arranged, provided with a pin pointed at its lower part. The releasing lever rests against the opposite side of the pin against which the hinged plate presses. This lever is constantly drawn down by a second spiral spring, spring No. 2, and is arranged in such a way that it may be drawn upwards by means of a cord or knob attached to it. When this is done, it slips from under the pin of the flat spring and rests upon the same. The hinged or revolving plate has a slot in which the projection of one arm of an elbow lever engages, this latter revolving on a point and being controlled by a spring; on the other arm of the elbow lever (opposite the one which has the projection) two suitably supported bars press which may be pushed back, that is to say against the elbow lever, from the outside of the apparatus or camera by means of two knobs projecting from the same.

These bars serve for releasing the shutter, both for time and instantaneous exposures. If the shutter be drawn up, the lever aforesaid rests, as already stated, against the pin of the flat spring. In the case of time exposures, one of the bars is pushed in until it encounters the pin against which the hinged plate presses. In this pushing back of the bar it encounters with its projection the elbow lever, moves this lever until the projection of the elbow lever comes out of the slot, and the hinged or revolving plate is released.

This latter is then at once drawn downwards by the releasing lever, which is resting on the pin of the flat spring, until the lever rests on the bar. The plate and lever have thus reached such a position that the objective is open, and remains in that condition as long as the knob or the bar is pressed down. When the pressure ceases, the lever is entirely drawn by its spring against the pin against which the hinged plate will press, by which means the lever slips under the pin attached to the plate. The plate is thereby released, and returns to its former position—that is to say, it again rests against the pin and closes the objective opening.

The operation is a similar one for instantaneous exposures.

The elbow lever is again pressed back by pressing on the knob of the bar. The plate thus released is pushed downwards by the lever, and, as this latter encounters no obstacle (in contradistinction to the operation in time exposures, where it rests against the bar), it slides at once away over the pin of the plate, which latter springs back again. The whole process is instantaneous.

The aforesaid parts for operating the shutter are arranged in this camera on the side of the partition No. 1, facing the lenses. The drawing up or releasing of the shutter takes place from the back of the camera by means of a stop spring or stop catch arranged on the inside, and having a pressure nob projecting to the outside. The stop hooks of this catch engage, when the camera is folded up, behind a pointed pin, which engages in a groove, and this drops back when the camera is expanded. As a drawing cord, which passes over suitable rollers, and is connected with the releasing lever of the shutter and runs under the bellows, is attached to the camera, the shutter is drawn up by the expansion of the latter.

By pressing on the knob of the stop catch or stop spring the pin is released, the spring of the shutter comes into action, the pin is thereby drawn forward in its groove.

Of course, as before stated, any other suitable arrangement of shutter may be employed.

It may also be remarked that the finder (German, "Sucher") attached to the apparatus may be used for adjusting, both for high as well as square-shaped views.

IMPROVEMENTS IN PHOTOGRAPHIC PRINTING FRAMES.

No. 1777. WILLIAM BUTCHER, Tranquil Vale, Blackheath, Kent, WILLIAM FREDERIC BUTCHER, Tranquil Vale, Blackheath, Kent, and WILLIAM JAMES SPURRIER, 3, Queenswood-road, Moseley, Worcestershire.—*March* 17, 1894.

THIS invention relates to the production of photographic printing frames, our object being to make such printing frames without any loose parts, and of such construction that they be much more quickly manipulated than those of known construction. To attain our object, we preferably construct our improved photographic printing frames entirely of metal, but any other materials may be used or employed.

The claim is: In a photographic printing frame, providing the same with the back or cover jointed to the frame, the said back or cover being secured in position, and of such conformation necessary for holding the paper or other material in contact with the negative by the catches, which are jointed on to the other side of the frame, substantially as described and set forth.

IMPROVEMENTS IN OR IN CONNEXION WITH PHOTOGRAPHIC CAMERA STANDS.

No. 17,702. ERNEST BISHOP, 188, Lewisham-road, Kent.—*March*, 17, 1894.

THE invention has for its object improvements in or in connexion with photographic camera stands, whereby an ordinary single-lens camera is enabled to be used in taking stereoscopic pictures.

For this purpose I fit to the top of a stand a sliding table or carrier to which the camera is fixed in any suitable manner. I provide the stand top and the slide or carrier with suitable stops at the required distance apart. The mode of using the apparatus is as follows:—The camera is fixed to the slide or carrier, and the latter is moved sideways against one of the fixed stops; a plate is then exposed, the lens is then covered, and the camera is shifted over to the other stop, another plate is then exposed, and the negatives are then treated in any known manner.

IMPROVEMENTS IN OR RELATING TO THE MANUFACTURE OF FILMS FOR PHOTOGRAPHIC PURPOSES.

(A communication from Thomas Henry Blair, 7, Rue de Colisee, Paris, France.)

No. 5504. ALFRED JULIUS BOULT, 323, High Holborn, Middlesex. *March* 14, 1894.

THIS invention relates to the manufacture of photographic films for use in what are known as roll-holders, where a long strip of sensitive film is carried in the apparatus, the portions of it to receive the impression being successively brought before the lens for exposure.

Hitherto it has been customary to spread the mixture composing the film upon a glass or equivalent slab, after which it is coated with the sensitive emulsion; this necessitates a great length of slab, and consequently of the room in which it is prepared, and has many drawbacks from a commercial point of view. By the present apparatus I am enabled to dispense with this long table and proceed as follows:—

I employ a drum or equivalent revolved by any suitable means at the required speed, the surface of this drum being smooth and suitably prepared to receive the mixture or other coating forming the substratum of the film. The drum may be constructed in any suitable manner, and of any suitable materials, but I find a cast-iron drum, resembling a belt pulley, suitably turned up and trued upon the face, to be suitable, and, in order to produce the required surface upon its periphery, I may, after turning it up, coat it with nickel, or with copper and nickel, or with other suitable material, then dress it with a very fine sand blast, and finally coat it with nickel or other suitable metal or material, for example, glass silicate or the like. This drum may be cased in partly to protect both drum and the film upon it to keep out dust, and also as it is then convenient to maintain the air within the casing and surrounding the drum at a suitable temperature and dryness. The upper part of the drum may be exposed, or the casing may be connected with the device supplying the "dope," that is, the body of the film upon which the sensitive emulsion is afterwards to be spread.

The supplying and spreading apparatus may be of any suitable construction, say, for example, a hopper with a narrow opening of about the ultimate breadth of the film, the material being allowed to exude through the opening on to the drum, which, revolving slowly beneath it, draws it out or allows it to escape as required.

The "dope" is stripped off the drum shortly before it reaches the point at which the fresh material is supplied, and is carried over bands, rollers, or equivalent supporting devices until sufficiently seasoned to receive the coating of sensitive emulsion. The speed of the roller is preferably so adjusted, in conjunction with the condition of the air surrounding the drum, that the "dope," when removed from the drum, is sufficiently set or dry.

To coat the strip of "dope" with the sensitive emulsion it is conducted into a dark room or chamber through a narrow zigzag channel, with a roller at each bend for the purpose of excluding the light.

The emulsion-supplying apparatus may also be of any suitable sort, but preferably I employ a tray or trough supplied with the emulsion, and maintained at the proper temperature, in or over which is a roller conveniently of the same width as the strip of "dope," the roller forcing the strip downwards on to or into the emulsion bath so that, as it passes, the strip supplies itself with the necessary coating of emulsion. After leaving the drum, and previous to reaching this point, the strip of "dope" may with advantage be left to hang slack, but it is desirable to have a certain amount of pull or drag upon it from the zigzag channel until it has fully dried, in order to prevent crinkling or bad surface.

From the emulsion-coating device the completed film is carried over any suitable rollers, bands, or equivalent supports to the device upon which it is rolled and carried, until the emulsion is set and the complete film is ready for use. This rolling apparatus may be varied in construction, but the following arrangement has been found to give excellent results:—Upon any suitable shaft or spindle is a small drum, or equivalent, to which is attached the end of an apron formed of canvas or other suitable material, upon which are preferably placed wooden or other slats or bars, each end of which may be provided with a projecting portion, equal preferably to considerably more than the thickness of the film, or other equivalent means may be adopted to prevent the second layer of film and apron from touching the former one, and to allow sufficient air space. The film is placed upon the apron or the slats, and the winding commences, the projections preventing, as will be understood, each succeeding layer of film and apron from touching the preceding one, while the film is thus held under suitable tension until dry, the pull of the winding apparatus extending throughout the film back to the emulsion-coating apparatus, as previously explained. When one length of apron has been wound on to the reeling apparatus, the film may be cut, and another roller and apron placed in the reeling apparatus, and the reeling process proceeded with, or an entirely fresh reeling apparatus may be brought into play if desired.

While changing from one apron to another, or one reeling apparatus to another, the emulsion coating may be stopped, although the "dope" drum may continue to revolve, the slack between the drum and the emulsion-coating apparatus already mentioned allowing of this.

The face of the "dope" strip which is not in contact with the drum takes a polished or glazed appearance, but the face in contact with the drum has what may be termed a "dead" surface or appearance, owing to the face of the drum being so prepared as to produce this. This dead face is the one upon which the sensitive emulsion is coated, and assists it in adhering to the "dope."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
23	Camera Club	Conference.
23	Lantern Society	
23	North Middlesex	*Clouds, Atmosphere, and Distance.* C. Roland Whiting.
23	Putney	
23	Richmond	
24	Birmingham Photo. Society	
24	East London	Lantern Night.
24	Great Britain (Technical)	*Recent Experiences in Photogravure.* Horace Wilmer.
24	Hackney	*Preparing Negatives for Printing.* S. J. Beckett.
24	Halifax Camera Club	
24	Lancaster	
24	Leith	
24	Newcastle-on-Tyne & N. Counties	
24	Paisley	
24	Rochester	
24	Warrington	
24	West London	Lantern. *Through the Border Country with a Camera.* G. Lamley and H. Selby.
25	Bath	
25	Burnley	
25	Leytonstone	
25	Photographic Club	*Film Photography and New Apparatus.*
25	Southport	
26	Camera Club	*The Art of Topography.* Rowland Briant.
26	Ealing	Technical. *Re* Outdoor Photography.
26	Glossop Dale	
26	Halifax Photo. Club	
26	Hull	
26	Ireland	
26	Liverpool Amateur	
26	London and Provincial	Lantern Slides from Rejlander's Negatives. Charles H. Oakden.
26	Oldham	
26	Woolwich Photo. Society	*Lantern-slide Making on Gelatine and Collodion Plates.* Andrew Pringle.
27	Cardiff	
27	Central Photographic Club	*On the Present Position of Speed-testing of Dry Plates.* J. T. Cadett.
27	Croydon Microscopical	Excursion Work of Saturday, April 14.
27	Holborn	
27	Maidstone	
27	Swansea	
28	Croydon Microscopical	The Zoological Gardens. Conductor, Mr. Crowley. Meet at the Main Entrance at 2.45, or at the Bear Pit at 3.
28	Hull	
28	Leytonstone	Open Social Evening.
28	Liverpool Amateur	Trevor and Dee Valley. Conductor, E. Lloyd Edwards.

PHOTOGRAPHIC CLUB.

APRIL 11,—Mr. R. P. Drage in the chair.

What effect would a tropical climate have upon Jena glass? asked Mr. WEIR BROWN.

Mr. FOXLEE said about 120 kinds of glasses were made at Jena Works, and in the glass catalogue it was stated which were fugitive and which were not.

Mr. BYNOE, *àpropos* of above glass, said that, the glass being so soft, great care should be taken in screwing the cells into the mounts.

Mr. FOXLEE, further remarking on the result of pressure upon glass when used for photographic purposes, instanced a mirror being sent from England to the Continent. It was sent over in a wood frame. Upon trial it was found to be something like the *one-hundredth of a millimetre* out. The learned professor using it had it set in an elaborate brass frame, with "set screws;" result—chaos. Mr. Foxlee, being over there, saw the mirror, and in a few moments, with the aid of a screwdriver, rendered the mirror serviceable.

Mr. Newell showed a series of whole-plate enlargements on Eastman platino-bromide from quarter-plate negatives. The enlargements were developed with ferrous oxalate.

A discussion was raised by Mr. WEIR BROWN on the best position of an oil lamp in an enlarging lantern—that is to say, a single wick being used, is it best to put it end on or broadside on with the condenser?

Mr. BRIDGE said the narrower and smaller the point of light the better the result.

The opinion generally of members was that a duplex or triple-wick lamp

ay, Newton's pattern) would give the best illumination, and without shadow f flame or lamp on the screen.

The CHAIRMAN gave a very short account of his recent travels, of which he ıid he would perhaps give details of later on.

Mr. NESBIT asked for a special night.

Mr. DRAGE agreed to show some of his purchases and to say something of hat he had seen and the people he had met, and later on perhaps give a ntern lecture.

Blackheath Camera Club.—A very successful conversazione and exhibition f members' work was held on March 28 to terminate the winter session of the lub. About 160 prints and 170 lantern slides were contributed by the embers, 64 slides and nearly 150 prints being submitted in competition. hree prizes were placed at the discretion of the Judge, the Rev. F. C. Lambert ho awarded two to the prints and one to the lantern slides. Mr. Ed. Hawkin, ook a prize for a picture entitled *Evening on the Thames*, and a prize of equal alue was awarded to Mr. C. Welborne Piper for a view in the village of Caris-rooke, the Judge considering the pictures equal in point of merit; both were ranium-toned bromide enlargements. Mr. H. Sandland, J.P., contributed a rge number of studies of animals at the Zoo, for which he was awarded a ecial certificate for "technical excellence in animal photography," four rints being marked and specially mentioned by the Judge. The prize for ntern slides was awarded to Mr. C. Welborne Piper for a set of four slides. great number of visitors were present during the evening, and two lantern ows were given, the first one consisting of the prize slides and a selection om the other slides sent in by members, including a number of Alpine views y Mr. S. Spencer; on the second occasion a set of seventy slides lent by Mr. . R. Dresser were shown.

Central Photographic Club.—April 13, Mr. Thomas Fall in the chair.—r. A. HORSLEY HINTON read a paper on *The Language of Photography*, of hich the following is a *précis*:—In considering some aspects of photography -night, I do so purely from the standpoint of the picture-maker, and pur-osely avoid the use of the term "artistic," for like many other expressions in ır language it has lost entirely its true meaning. Those who are interested in otography for its art possibilities let me ask if they have ever considered at, even as chemical science when employed in certain narrower channels comes no longer chemistry by photography, so, when photography is ought into service for the production of a picture, a work of art, it is no nger photography, but photography applied. I take it the artist has two ts of materials: on the one hand, all the contents of his dark om and his kit; and on the other hand all the infinity of objects on e broad face of Nature, mountains, rivers and plains, and all the living ings that move thereon; trees, flowers, and the all-pervading light are much the photographer's materials as acids, alkalis, lens, plate, and per. He receives from Nature certain pleasurable sensations, ideas d feelings, and notices that these are produced by the arrangement of rtain forms and the degrees of illumination, and so he seeks to reproduce ese sensations and ideas, employing for his purpose whatever the chemist has aced at his disposal on the one hand, and on the other the forms, the light, e shadows which Nature gave him as his materials. Nature is a great key-ard, from which we select just those keys or notes which will compose the rmonious chord we heard sounded by Nature herself; or, yet again, an in-haustible volume, from which we may choose such words and sentences as ll express the ideas we gathered during its perusal. The artist's function that of a translator. The best translator will be he whose knowledge of the iginal is most complete, and who is in thorough sympathy with his work; t, mark, he does not glory so much in showing his cleverness of phrase or ill in dictionary knowledge as in making such a translation that the ader catches the spirit and sentiment of the original. Two photographers of ual knowledge as artists may be at work on the same spot, and their selec-n of subject may differ widely, yet each will acknowledge the merit of the her's picture when finished. It is not the objects portrayed, but the interpreta-n or translation each determined to make use of certain objects, not to set them wn in facsimile, not to copy them, but to portray them in such a way and der such conditions as to convey to the spectator ideas quite apart and ove the interest attaching to the actual objects themselves. The truthful-ss of the impression on the spectator is secured by something quite apart om simply copying the objects of Nature. It is rather that Art has been ployed to group various lights and shades in such forms and such positions at the total effect is to awaken in the spectator the same sensation as the iginal scene produced upon the painter. The sensation is first a pleasure, oduced by the happy arrangement of lights and darks, which the artist has t down with the sole purpose of making something that shall be *like* to ature. To copy Nature is an impossibility. What, then, is it that pictures effect? May it not be that from knowledge, from acquaintance with Nature e artist knows in just what manner to arrange his trees, forms, &c., so that, thout being physically accurate or like, they produce a sensation as Nature rself? We may have a "speaking likeness," we may have an impressive ene. The expressions of all Nature are emotional, according to the mind of e observer and the language of art, if our pictures, if our photographs should a practical expression of some impression derived from Nature quite apart om the representation of facts and things. Thus, with pure impressionism d with naturalism controlling photography, some may say that, even if Art n claim her, she is so utterly lost to common sense that she is scarcely worth claiming.

Croydon Camera Club.—April 14, a party of eleven (in charge of Mr. W. ttan Winter), known as "the Carshalton Artist") visited Carshalton, and means of the influence of the leader were enabled to visit and photograph rtain scenic gems not available to the general public. A busy afternoon rminated with a high tea at the Greyhound, hard by Ruskin's famous ol.

East London Photographic Society.—March 27, Mr. J. H. Gear in the chair.—*A Chat on Photography*.

ON April 3, the last Smoking Concert of the season was held at the [illegible] and Cushion, London-wall, E.C., about seventy members and friends being present. The humorous singing and pattering of Mr. Fred [illegible] proved irresistible; two cornet solos were ably expounded by Mr. H. Perrin; Mr. Percy C. A. Marsden's three martial songs thoroughly firing the assembled company. Others, none the less worthy, who contributed to and sustained the concert were Messrs. Chapman, Flux, Neele, Pasco, and Wilkinson.

APRIL 10, Apparatus Night, Mr. J. H. Gear (the President) in the chair.—On the table was displayed a fine array of apparatus, from the highly polished and bedecked instruments of the manufacturer to the more unpretentious and lowly mechanism of the amateur. The President exhibited, through the kindness of Messrs. Taylor, Taylor, & Hobson, specialities of their manufacture, also Howard Farmer's view meter and exposure meter, and many other accessories to photography. A simple arrangement was shown and described by Mr. Bennett for converting a Thornton-Pickard *instantaneous* shutter into a time shutter also, the principle being the insertion of a piece of indiarubber between the arm and shutter, thereby allowing the blind to be raised by the cord below without interruption. Other interesting ideas and novelties were shown by Messrs. Pasco, Uffendell, and Barber.

Hackney Photographic Society.—April 10, Mr. W. L. Barker in the chair.—In the course of a discusssion *re* removing yellow stains from negatives, Mr. W. H. BARNES said that, to remove a stain from a negative which had been dried, was a difficult and uncertain matter. He had found that the best way to succeed in such a case was, to well soak the negative in water, and then immerse in an ordinary sulphocyanide toning bath. Mr. MOORE recommended bleaching with mercury, washing, and then redeveloping with ferrous oxalate. Results of work done at the Zoo excursion on the previous Saturday were shown by Messrs. Hensler and Guest. Mr. W. H. BARNES then gave a paper on *Negative-making on Cut Films*. Comparing films with plates, Mr. Barnes said that, although celluloid was not so perfect a support for emulsion as glass, yet most of the defects accompanying the earlier make of films had, by improved methods of manufacture, been swept away, so that it was now possible to get negatives on cut films as perfect as on glass plates. To tourists, films should be a great convenience as compared with glass; they were less bulky, lighter, and unbreakable. Mr. Barnes showed negatives resulting from experiments he had made as to the relative values of plates and films. Glass and celluloid, coated with the same emulsion, exposed and developed under identical conditions, produced equal results. Experiments made to ascertain whether pressure on the films, either before or after exposure, had any bad effect on the quality of the negative, failed to show any such effect. It had been suggested that the camphor in the celluloid caused deterioration of the emulsion. He placed some dry plates in a box containing camphor shavings for some days, and negatives made from the said plates were as perfect as others made from plates which had not been exposed to the camphor vapour. A portion of a plate was placed in contact with a block of camphor for some time but the part so covered, when that plate was afterwards exposed and developed, appeared no different to the uncovered portion. In developing and fixing films it was necessary that they should be kept flat, and for this purpose a film-holder was advisable. Mr. Barnes showed a holder made of ebonite in which the film could remain during the whole process from development to the final drying. If no holder were used in washing the films should be placed back to back, they could then be placed in the racks like glass plates. Films should be dried by suspending with clips—tie clips were as good as any, and cheap. In varnishing, a cold drying varnish must be used, and one containing no alcohol, as the latter was a solvent of celluloid. The varnish must be poured into a dish and the fillm immersed for a minute or so, drained, and then hung up to dry. As regards freedom from halation, films might be slightly better than glass plates, but not much, and Mr. Barnes advised the use of backing. A discussion followed the paper, several members detailing their respective opinions of films. It was conceded generally that, provided a perfect film could be obtained, it would hold many advantages over a plate. But films, in the operators' experiences, could not be relied on. Sometimes they were perfect, but at other times were far from being so. A catalogue of grievances was brought against them in which charges of sticking together, spottiness, and faulty cutting predominated. Mr. Barnes, in his reply, dealt in detail with the complaints, some of which concerned films as made a year or so ago, and promised to send the Society for distribution some samples of films as now made.

North Middlesex Photographic Society.—April 9.—Mr. B. J. Wall was to have lectured to the members on *Failures*, but unfortunately illness obliged him to be a living example of a "failure" to attend. In his absence the members had to get up a scratch discussion, and many and varied were the topics touched upon. Samples of the new Otto paper, toned with chloride of gold and water only, were passed round, as were also examples of Solio, toned in precisely similar manner. Mr. Gregory exhibited a negative exposed at Burnham Beeches, the centre of which showed signs of double outline, though at the edges of the plate the image was perfectly clear. It was thought this might be caused by the lens (of French make) not being accurately centered. Mr. Taylor showed a negative exposed in March in Jersey from the interior of a cave looking out, the exposure of which was eleven minutes on a Sandell general plate with *f*-11, the result being almost total reversal. He had developed with a pyro-soda developer, and was at a loss to account for the reversal. No member could give a reason for this. This Society has made another move forward, and now holds weekly meetings at Jubilee House, Hornsey-road, N., the meeting night being Monday. The meetings are arranged as follows:—Second and fourth Mondays, ordinary lectures and demonstrations; third Monday, technical instruction; first and fifth Mondays, informal discussions. Visitors are always welcomed.

West London Photographic Society.—April 10.—Mr. A. PRINGLE delivered an address on *Negative Development*. He prefaced his remarks by the statement that in photography development was the most important branch. The views of Messrs. Hurter & Driffield, that the results depended

solely on exposure, and could not be modified by the developing process, had been disproved. Mr. Cadett, an eminent chemist and investigator, had changed his opinion on this point, and, if the photographer had no power to vary the result in the developing process, the lecturer's remarks would be to no purpose. There were two main points to be considered a system of development :—1. It was necessary that the developing agent should have unlimited power. 2. There should be complete control. By power he meant the capacity for reducing silver where light had acted in the least degree. He had made experiments with the new developing substances, eikonogen, rodinal, amidol, metol, and others, and he found they had no greater reducing power than pyro ; but, compared with pyro, they all had the advantage that they reduced all reducible metal without clogging the high lights. This was a valuable point in their favour, and the lecturer stated that for minimum exposures he recommended these new developers. Dealing with control, the lecturer stated that it appeared, with his present experience, that it was easier with pyro than with these new substances ; but, with more extended practice, it might be found that this view of the matter would change. He used metol (Hauff) by preference. The best developer for an under-exposed plate was the hammer. Dealing with pyro development, the lecturer said that, to compensate for slight under-exposure, keep down the pyro and increase the alkali. Another expedient was to soak the plate in a weak alkali before adding the developer. An over-exposed plate can be made into a decent negative by the following procedure :—Increase the pyro and bromide, and keep down the alkali. Make the development proceed slowly—a slowly developed plate had more contrast. As soon as details are out, flood the plate with a solution of citrate of soda or potash, or of both. The details will cease to appear, but density will increase. (Four grains of citrate to each minim of liquid ammonia in developer.) He could strongly recommend this last expedient from experience. With normal exposure it was possible to alter the quality of the resulting negative, and this gives scope for artistic treatment. For a soft effect, increase the alkali. Mr. Pringle detailed his method of dealing with some plates exposed in tropical countries, and stated that he employed metol to conteract the tendency to fog in plates that had suffered from the climate, or had been over-exposed. Bromide could be used with metol the same as with pyro with the same result. In the case referred to three developers were mixed, (1) with a trace of alkali only, (2) with more alkali, (3) with the full quantity of alkali, according to the formula issued by the makers of the metol. The plates were treated according to the subject, it being assumed that those having foliage would err in the direction of under-exposure, whilst those with sea and sky would be over-exposed. Dealing with two of the new developers, Mr. Pringle said that with amidol there was difficulty in getting density when the plate was over-exposed, but if the developer was allowed to act long enough, the trouble could be overcome. Metol gave density readily without chalkiness, and produced a negative of good printing colour. A new secret developer (called Velox) had been brought out by Mr. Cadett, and it was a remarkable one. It had very great power—more than pyro—and gave ample density. It kept well in separate solutions, but should not be used twice. Mr. Pringle confessed to a preference to metol over other developers, and he considered it would run pyro very hard. In regard to the alleged poisoning by metol, he had been up to his elbows in it without harm, but some skins were specially susceptible, and their owners should therefore adopt the precaution of using rubber gloves, or avoid putting their fingers into the developer. A discussion followed, in which Messrs. Peel, Stein, H. Selby, L. Selby, Rogers, Rainger, Clements (a visitor), and Brown took part.

Woodford Photographic Society.—April 5, the President (Mr. H. Wilmer) in the chair.—Mr. E. Marriage showed several negatives of carvings on a stone font. The exposures were made by burning ten inches of magnesium ribbon, fifteen inches from the object, with *f*-16. The President showed a number of prints from his own photogravure plates, and some platinum-toned prints by Mr. Charles Whiting. Mr. J. W. Spurgeon then read his paper on *The Artistic Aspect of Photography* [see next week]. Mr. H. T. Malby said that photography possesses to a marvellous extent the power of representing detail, and that this quality should not be sacrificed for mere eccentricity. With judgment, that power is of the greatest value, and different planes can be shown without sacrificing detail. The Secretary (Mr. H. W. Bennett) contended that rules of composition were not of the importance claimed for them. Some very successful pictures were directly opposed to them. The President said that, while some of the finest pictures defied all rules, yet the canons of composition are really necessary. Many of the older painters followed rules very closely, but in the modern or naturalistic schools there was much greater freedom. There was a tendency to paint nature as seen by the artist rather than adapt it to any set of rules.

Woolwich Photographic Society.—April 12, Mr. W. H. Dawson in the chair.—A small committee was elected to arrange for a Smoking Concert, to be held on May 3. The Summer Outing arrangements were discussed. There will be plenty of work for the cyclist members, who are in considerable force in the Society. Excursions in which all can join will also be frequently held during the summer. The Chairman introduced Mr. Ramsay to the meeting, who proceeded to give a demonstration on *Platino-bromide Paper*, describing, by the way, the special features of the paper. The process of development is very similar to that of ordinary bromide papers. Judging from the results shown and the specimen prints handed round, the members were delighted with the new paper. Some conversation followed, and a hearty vote of thanks was offered to Mr. Ramsay and cordially responded to. A discussion followed on the work of the Affiliation Committee, in which Messrs. W. H. Dawson, E. G. Kimber, J. B. Panting, and others took part.

Ashton-under-Lyne Photographic Society.—April 3.—Dr. Hamilton lectured on *The Grand Tour of Mont Blanc.* A great many of those who heard the lecture will never have a chance of doing the grand tour themselves. They will never get out of England at all until they get "out of the world" at the same time, and even then it may be questioned whether that phrase is strictly up to scientific datum. However, in spirit the audience were "off to the joyous Alps which called to them aloud." They could see in the mind's eye the stupendous Matterhorn and the mightier Mont Blanc in very remarkab photographs projected on the screen. How far they realised the magnitud the sublime impressiveness, of what they saw depended, of course, on t mental sensitiveness of the beholder, and the scale of dimensions applied to t pictures. That would vary with every pair of eyes turned upon the canva Mr. Charles Lord spoke truly when he reminded the audience that wor and photographs are altogether inadequate to give a full interpretation of suc great natural marvels. Mr. J. H. A. Tipping, the Chairman, gave an amusi local illustration by saying that a camera turned on Chadwick's Dam wou give a picture of Chadwick's Dam, neither more nor less, but an artist mig idealise and glorify the scene into something like the Lake of Geneva. If e dowed, therefore, with the painter's imaginative faculty, the audience, fro the views on the screen, could have piled up the Alps to their proper altitud extended them to proportions of suitable magnificence, coloured their sno with the delicate rose tints of the twilight after-glow, and filled the air wi the chill breath of the glacier. Certainly this is better than to view the sce merely with the unsympathetic eye of a camera lens, which takes most acc rate record of the blacks and whites, and relative dimensions of objects, but itself destitute of all kinds of emotional susceptibility. In one sense, as M Tipping says, photography is absolutely true ; but in another, as Ruskin h pointed out, it is not so. The great interpreters of nature, like Turner, spe to the human heart with a power transcending any results produced by phot graphy. The imagination of ordinary people is too flat and dead to attain strong enough impression by the bare, bald, and strict matter-of-fact truthfu ness of photography. It needs to be fired by the noblest efforts of hum genius and sympathy to bring forth some of the great effects evoked by t natural scenes when one has been among them all day long, and has with h camera been taking view after view, while overhead "the great delibera sun" has "counted the mountains one by one." As Mr. Lord pointed ou and Dr. Hamilton admitted, photographs, however perfect, and description however eloquent, fail to call forth more than reminiscences of these delightf impressions. Nevertheless, no one could come away from the lecture without feeling that he had really been viewing some of the sublimest scenes on t face of the earth, and that in an hour and a quarter he had enjoyed t cheapest and best trips of his life without once stirring from his seat.

Fairfield Camera Club.—April 13, Mr. H. Holt (Vice-President) in t chair.—The subject for the evening was a practical demonstration *On Development of Hand-camera Negatives with Pyro-soda, Pyro-ammonia, a Hydroquinone, and Hints on Hand-camera work*, by Mr. T. E. C. Wilso who is a well-known hand-camera worker and patentee. The lecturer develop half a dozen snap-shots, and clearly described the methods of working with t different developers.

Leeds Photographic Society.—April 5.—Mr. Thomas Ramsden, of t Leeds Academy, criticised upwards of sixty lantern slides, the pick of t members' work from an artistic standpoint, as they were projected on t screen, the slides having been previously submitted to him for thoro examination. In his criticisms Mr. Ramsden dealt fully with such matters composition, concentration, light and shade, &c., and pointed out the vari defective points in the pictures as such.

Leicester and Leicestershire Photographic Society.—April 12, the P sident (Mr. J. Porritt) in the chair.—One member elected, four propos Excursions Committee elected. President offers silver and bronze medals best set of six prints from negatives taken on excursions—any size. After business the members' slides were passed through the lantern, and were all exceptional merit.

Glasgow and West of Scotland Amateur Photographic Association April 16.—Mr. Francis H. Newbery, Head Master Glasgow School of A discoursed on *Composition in Landscape and Figure.* Using the blackbo he gave examples of faulty composition, and showed how the subject migh better treated, and faults minimised. He then showed on the screen copie pictures by great masters, and indicated the principles on which they composed, and finally criticised some slides shown by members.

FORTHCOMING EXHIBITIONS.

1894.		
April 20–28	*Newcastle-on-Tyne International.	Hon. Secretar Art Gallery, Grainger-street, Newcastle-on-Tyne.
,, 20–28	*New York.	T. J. Burton, 111–115, West Thirty-eigh street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is tak of communications unless the names and addresses of the writers are given.*

IS RETOUCHING A CURSE?

To the Editor.

Sir,—Kindly permit me a few words in answer to Mr. Thomas F remarks anent retouching. According to your last issue, he said at Central Photographic Club, "Retouching is a curse!" This is a sweeping assertion. I would rather say, *Injudicious* retouching

course, such as is carried on by a vast number who have never studied even the first principles of art. Mr. Fall goes on to say that photographers should do their own retouching, as though the intelligence and artistic ability of all photographers were infinitely superior to that of retouchers. Unfortunately, some photographers are too prone to class all retouchers alike. About time that retouching *artists*, who have been remodelling negatives as long as such thing has been known, took arms against this sea of trouble, and reminded photographers that their success for many years past has been due in a very great measure to retouching.

Retouchers have much undeserved abuse hurled at them regarding work which they should not be held responsible for, and which they would not be guilty of if it were left to their own judgement; but it too frequently happens that they are not considered sufficient masters of their work, but must work according to the ideas of the photographers, however illiterate the latter may be. The galling part is, they often dictate, not suggest. One man who did not believe in retouching was some years ago flourishing some vile untouched specimens of patches of white and black, and exultingly exclaimed to me, "Look at that, me boy! no fake there!" That man had soon to shut up shop. Without judicious retouching, methinks the photographic business will soon go to ——. Oh, my photographic—I mean prophetic—soul!—I am, yours, &c.,

EDWARD G. CARVER,
One of the Pioneers in Retouching.

41, *The Vineyard, Richmond, S.W., April* 17, 1894.

PHOTO-MECHANICAL NOTES.

To the EDITOR.

SIR,—Much as I dislike entering into a controversy that cannot be of interest to any one except the disputants, I cannot allow your contributor, Mr. W. Gamble, to make such sweeping assertions respecting the wet-plate worker as he does in your issue of the 13th inst. If his experience of the old wet-plate hand is really as he tries to make us believe, it does not say much for the company he has kept, his professional associates must have been of a very common order indeed. I am glad to say my experience of the wet-plate worker, extending over the last thirty years, does not tally with Mr. Gamble's. The very nature of the work demands cleanliness and nicety in all the operations, and this, too, combined with a certain amount of skill. I don't know whether this will account for Mr. Gamble preferring dry plates now. I contend there was a greater percentage of good workmen in the old days than there is at the present time.

The comparison that Mr. Gamble gives in the time of working the two processes will cause some amusement to those workers who are conversant with both; and, as regards cheapness, the fact that most all large commercial houses use wet plates in preference to dry for copying, enlarging, making lantern slides, and for process work, will, I think, sufficiently determine this question.

In conclusion, Mr. Editor, I have only to express my regret that your scissors were not sharp enough to cut away this unjust and uncalled-for slur on a body of men who have helped to make photography what is is.

April 17, 1894. CHARLES WE[illegible]ING.

PHOTOGRAPHS OF WILD ANIMALS WANTED.

To the EDITOR.

SIR,—I am anxious to put myself into communication with any photographers—amateur or professional—who may have photographs of *wild animals in their natural haunts*. For example, has any one yet got a "snap-shot" at a lion with a hand camera? I have heard of a photograph of a tiger asleep in the jungle, which was taken years ago in India.

Groups of wild animals, flights of birds, a whale spouting at sea, porpoises leaping, crocodiles on the banks of the Nile, a troop of antelopes, a pack of wolves—these are the kind of photographs I want. Can any of your readers help me?—I am, yours, &c.,

H. N. HUTCHINSON, *Author of "Extinct Monsters."*

30, *Vincent-square, Westminster, S.W., April* 15, 1894.

THE USES OF NICOL PRISMS IN PHOTOGRAPHY.

To the EDITOR.

SIR,—May I call your attention to a clerical error in your report of Mr. Birt Acres' paper on "Polarisation applied to Photography?" My initials are as under, not "C. Dibdin," as reported.

With reference to the use of a bundle of glass plates instead of the prism, I stated that I had tried this with success in cases where definition was not important. Respecting the fact that I am the holder of a patent for this process, I should like to add that this protection not only affects the use of a Nicol prism, but the use of any polarising arrangement in conjunction with the lens, and also the method of mounting. I hope to be in a position shortly to place the arrangement, which I have found most suitable, on the market, when your readers will have full opportunity of testing its merits.—I am, yours, &c., W. J. DIBDIN.

Mayfield, Grange-road, Sutton, Surrey, April 16, 1894.

[We are sorry that Mr. Dibdin adopts the precise tone he does in his letter, which, we suppose, is to be read in the light of a challenge. Bearing in mind the law that, if the thing "patented" is not new in the sense of its having been previously known and publicly described, its validity is open to question, what does Mr. Dibdin say to our having, in these pages, fully described the uses of the Nicol prism for photographic purposes many years ago? We observe that Mr. Dibdin claims the use of "any" polarising arrangement. If this includes tourmaline and Herapathite, we may remark that these were used long, long ago, while, if it comprehends the black glass mirror, we can say that on May 26, 1892, Mr. A. W. Clayden showed at the London and Provincial Photographic Association the polarising arrangement he employed, which consisted of a swing camera with a revolving black glass mirror, inclined to the axis of the lens. Possibly Mr. Dibdin's claim includes some new arrangement not here specified; but, if it does not, and without wishing in any way to discount the value of his patent, we may assure those of our readers who desire to employ polarised light in photography that they will not incur the slightest risk in using either of the well-known systems we have mentioned.—ED.]

THE BENEVOLENT.

To the EDITOR.

SIR,—Mr. Snowden Ward has taken me rather too literally in saying I "had taken a box to inflict fines on our members." I certainly made a suggestion that Societies should take boxes, and have fines, such fines to be handed over to the Benevolent. Now, Mr. Editor, I certainly think we amateurs should do something for our poorer and professional brethren who, to *some* extent, lose by our taking to the art, and a small sum added to the Society box, say, for late attendance or for neglect to assist the Society in some way, might be the means of doing good; the small amount so paid would not be missed, and such kindly feeling might go a long way towards ameliorating the antipathy some professionals have towards us. An occasional collection taken up on a lantern night at clubs and societies among the visitors present would not be grudged, and it would be only a return for the enjoyment they had had that evening. I merely throw out the suggestion, and hope it may be acted on.—I am, yours, &c., W. FENTON-JONES.

April 16, 1894.

THE DETENTION OF SPECIMENS.

To the EDITOR.

SIR,—I think it time that sending specimens for operators was done away with.

During the last month I have sent to five different advertisers, and have a few returned, *damaged*, from two only; and it becomes a serious question, as, when a man is unemployed, his stock gets used up, and he can't keep asking for more.—I am, yours, &c., W. WAITT.

Hove, April 17, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, ferrotype material in exchange for artists' colours, &c.—Address, R. SMALLEY, 106, Clarendon-road, Morecambe.

Wanted to exchange Moss & Mitton's latest improved hot-rolling press for good studio camera and slides.—Address, W. SHERMAN, Great Yarmouth.

Will exchange 1893 whole-plate instantograph, complete, with whole-plate camera by Meagher, for 12×10 outfit by good maker.—Address, HERBERT NORRIS, Photographer, 11, Market-street, Newton Abbot.

Wanted to exchange a five-stringed zither-banjo, value 7*l.* 10*s.*, as good as new, in American leather case, for cabinet camera or larger, with three or more dark slides and instantaneous shutter.—Address, J. ROWSE, The Studio, Willow-street, Oswestry.

Wanted, first-class half-plate set, or 15×12 portait lens. Will give in exchange a typograph, foolscap size, with ink, roller, pen, &c., in box complete, and 10 window show racks, for knives, forks, spoons, &c., nearly new.—Address, JOHN R SINGER, The Studio, Chippenham.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

S. HOCKETT & CO.—Received.

RECEIVED.—The Birmingham Photographic Company.

W. POOLE.—Mr. Barker's address is Lavender-hill, Tonbridge, Kent.

C. J. T.—We should think that by doubling the quantity of pyro tendency to fogging would be increased.

J. H. C. COLTON.—If zinc blocks are made from the four photographs sent, it will constitute no infringement of the printed handbill.

SARAH B.—The silver stain can be removed by the application of a solution of cyanide of potassium to which tincture of iodine has been added.

F. R. S.—Without being absolutely certain, we have an idea that Count Montizon was the first to photograph the animals in the Zoological Gardens.

SPOTTING.—Either employ more gum in the colour or use the albumen colours sold specially for the purpose. They may be had from most of the large dealers.

R. SNOW (St. Briene).—Messrs. Marion & Co., Soho-square, publish a work, by R. Slingsby, on Flashlight Photography, which will probably give you the information you desire.

C. W.—As you wish your communication to appear anonymously, we must decline its insertion. It may be true for all we know; but, as you have not the courage to let it appear over your own name and address, it may be open to doubt.

T. T. A.—From the data supplied, we believe your lenses are mounted too far from each other. Try them in an experimental mount at least one inch shorter than the present one. The combination ought to cover a plate 22 × 18 with ease.

W. J. C.—If the gelatine paper becomes so soft and tender in the film when the sulphocyanide bath is employed, you must take to the alum bath again. The temperature of the water has become higher than it was during the winter months—a fact that appears to have been overlooked.

JUNIOR.—1. We do not recommend one maker's goods in preference to another's. You should be able to supply your requirements from the list of hand cameras named. 2. Better have a quarter-plate. 3. By all means buy a second-hand one, if you can assure its being in good condition.

JUSTICIA.—The journal referred to was edited by Thomas Sutton, of St. Brelade's Bay, Jersey. He died several years since. After the stoppage of his journal (*Photographic Notes*) he joined the staff of THE BRITISH JOURNAL OF PHOTOGRAPHY, to which he was attached till his death.

ARCADIAN asks: "Is there any patent right connected with the so-called 'continuous' backgrounds? Can any one make them for sale or for their own use?"—We do not think any such patent rights exist, backgrounds of this nature having, we believe, been made and used many years ago.

S. BRAYLEY.—The negative sent certainly shows that the lens is not at fault. The blurring and want of sharpness in the blossom is due to halation and, in a very slight degree, to movement by wind. Had the plates been backed, the negative would have been a charming one, notwithstanding the trifling movement.

R. NICHOLS.—The custom is that the negatives are the property of the photographer if they are taken in the ordinary course of business; but, as you have charged for the negatives on the bill, which has been paid, instead of charging for views, we are afraid you will have to deliver them up according to the demand.

W. J. REED.—The only white cloth that we can suggest for stopping out the sun is what is known as tracing linen which is to be had from artists' colourmen; but we should recommend in preference to the use of that material, that the present blinds be so arranged as to fit closer up to the glass and to overlap each other a little.

THOMAS NEWELL.—To make collodion for enamelling purposes, dissolve about six grains of pyroxyline to each ounce of a mixture of equal parts of ether and alcohol. Methylated ether will do, so will methylated alcohol if its specific gravity is not greater than ·825. We do not understand what you mean by the "Cola process."

T. A.—Dry-plate makers do not take responsibility in the matter of broken plates after they leave their premises. They may get broken in transit to the dealers, or from them to the user. If you had any claim, it would be against the dealer who supplied them to you. It certainly could not be against the maker, with whom you have had no dealings.

B. STILLWELL.—If the collotype plate, after sufficient moistening, takes the ink evenly all over, it is clear, supposing the exposure has not been very much overdone, that the gelatine has become insoluble, or non-absorbent of water. There are many causes that may bring about this condition, and the most prolific ones are slow drying of the film, long keeping, and an unsuitable kind of gelatine.

ALF. MCD.—Because the photograph did not bear the word copyright upon the mount, it must not be assumed that it is not copyright, and that any one pirating it would be absolved from liability. The law does not require that a copyright picture must bear the word copyright. Our advice is, Accede to the terms proposed by the one who took the photograph, they are very fair under the circumstances.

O. L.—There would be no objection whatever to the use of enamelled iron dishes for gold-toning solutions, provided the enamel is perfect—a condition that does not always exist even when the dishes are new, and very frequently not after they have been in use for a time and subjected to rough treatment. If the enamel be cracked so as to expose the iron, the gold would be quickly reduced—not on the prints, but on the metal.

A. L. says: "I am a photographer in a small country town, and supply dry plates and chemicals to a few amateurs out of my own stock. One gentleman occasionally has a couple of ounces of cyanide of potassium. Yesterday in looking through some back numbers of the JOURNAL I saw that some one had been fined for selling the same thing. Will you kindly say if I run any risk, or was there something more in the case referred to?"—In selling the poison our correspondent certainly renders himself liable to a penalty of 10*l.* and costs.

W. FRAZER asks: "1. Can you inform me whether there has been any notice as to photographing at the forthcoming Antwerp Exhibition? To whom should I apply for permission? 2. Can you also tell me who I should apply to for permits to photograph in Windsor Park and also at Hampton Court?"—In reply: 1. We are not aware of such information having been published. Perhaps some of our readers will know. 2. For Windsor Park address the Ranger; for Hampton Court, we think, but are not sure, H. W. Primrose, Esq., Office of Works, Whitehall, S.W.

T. O. N. E. writes: "I cannot get the gold out of my old toning bath (sometimes acetate and sometimes borax). When I add the sulphate of iron solution, sometimes a little turbidity appears and a very trifling settlement takes place, but not so much as I fancy there ought to be. Is there anything that will throw down more gold than the iron?"—If the baths are thoroughly exhausted, there will be no gold to precipitate. Iron will throw down any gold that may be in the solution. If its addition fails to produce turbidity, it may be assumed that all the gold has been reduced beforehand.

ANTI-PATENT writes: "In a recently published specification of a patent a claim is made for the preparation of a paper which is really very old. I have been in the practice of preparing paper in precisely the same way for the last dozen years or more. Paper which I believe is made in the same way has also been regularly supplied for I know quite twenty years. Under these circumstances, can such a patent be valid, and can the owner of it stop my making it or restrain the commercial sale of it?" Certainly not, such a patent would not be worth the paper upon which it is written. Many rush to the Patent Office, now that patents cost so little, without ascertaining what has been done before.

MR. T. GRINFIELD, of Weston-super-Mare, sends us the following verse:—

Photography.

O wondrous pow'r which Phœbus, God of Arts,
To photographic artist now imparts!
'Tis like the primal voice that waked the sun—
"Be light!—light was." Be portraiture!—'tis done.
He, in a moment, tracing line for line
(Engraver's finest touch is far less fine),
Stamps on the mirror plate the "human face divine."
Well did the matchless bard of Mantua write—
"Who dares impeach thy truth, thou source of light?" *
Oh, had bright Athens known this magic skill,
Demosthenes had look'd his lightning still,
And Paul's majestic gaze had beam'd as on Mars Hill!

* "Sol tibi signa dabit. Solem quis dicere falsum audeat?"—*Virgil*, Georg., i. 463.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1773. Vol. XLI.—APRIL 27, 1894.

COPYRIGHT IN PHOTOGRAPHS.

N another page we give, as promised last week, the text of the ct relating to Copyright in Works of the Fine Arts, and for epressing the Commission of Fraud in the Production and ale of such Works. We shall here direct the attention of the eader to some of the more salient features of the Act, which ave special reference to photographs and photographers.

It has already been most abundantly and clearly stated—nd by this time ought to be universally recognised—that no ne, by the mere fact of his having produced a photograph, nereby acquires copyright in such production. Everything epends upon the circumstances under which it was taken.

A landscape photographer, off on an outing, either alone or ith kindred spirits, has copyright in all his productions, unless e has been induced, for a pecuniary consideration, or its quivalent, to take a view of a cottage, a villa, a group, or any pecial subject, in which case, while the negative remains his roperty, the copyright in the picture belongs to the person n whose behalf it was made for the consideration afore-nentioned.

This is also the case as regards portraits taken in a photo-rapher's studio. If a sitter gives an order for his portrait in ne usual way, paying for the same, the copyright vests in the tter, and the photographer has no right to make any use of it or himself. Supposing a photographer takes a duplicate for imself surreptitiously, or without the express permission of ne sitter; or suppose he makes a duplicate negative, in order ther to make sure, or to give his client a choice of position, o whom belongs the copyright of the rejected picture, the egative of which still remains in the photographer's posses-on? Although a case so definitely put as this is does not nd mention in the Act, yet has it been laid down by compe-ent lawyers that such copyright belongs to the person who sat nd paid for his portrait, and that all that belongs to the pho-rapher is the glass plate on which the portrait is impressed. This certainly is in accord with the spirit of the Act. If a itter grants permission to the photographer to take an extra icture for any special purpose, it will, we conceive, be illegal or him to utilise it for any other than the purpose specified, which may be its exhibition in the show-case, or at a particular xhibition. In both of these cases special permission to do so hould be asked and obtained.

We remember a case in which a man who had been photo-raphed in the ordinary course of business suddenly sprang into otoriety. Anterior to his execution the photographer found duplicate negative, not that from which the order was filed, ut one taken at the same time. He registered this as his wn copyright, and succeeded in getting an injunction restrain-ing another from making a copy of it on the ground of its being an infringment of his copyright. At the present day all lawyers of any pretension to eminence would say that the so-called copyright was bad, because that was vested in the man who was the sitter, and he had not made over his copy-right to the photographer at the time of sitting.

A good deal of liberty was at one time taken by even eminent London publishers of photographs. We have in our recollection the following incident: During the late Franco-Prussian War M. Reutlinger, the eminent Parisian artist, a native of Germany, found it expedient to escape from Paris during the siege of that city, and come to London. One day he called upon us, in a state of some excitement, and said he had just seen enlarged copies from some of his portraits in the window of a firm of celebrated portraitists and photographic publishers, and not only so, but each had the word "copyright" printed on the mount. We quite admit it was a shameless act, but Reutlinger had no redress, for, being a foreigner, he was debarred from having his pictures made copyright in this kingdom at that time. It will be seen from clause 1 of the Act that copyright is, or was, confined to the author who is a British subject or resident within the dominions of the Crown. We are happy to say that, by the recent International Convention at Berne, this restriction has been done away with.

It is greatly to be regretted that the existing law of copyright is so exceedingly imperfect as it is, also that it is capable of being so loosely interpreted, especially as is the case in some provincial courts; but even in London, in a case in which certain local views (copyright) had been sent to France to be copied, it was held by the Master of the Rolls that no penalties could be recovered under section 6 of the Act, as the penalty was upon the unlawful *making*. The copyright was in England, the making abroad.

But section 10 somewhat meets a case of this nature, for it states that such repetitions are absolutely prohibited from being imported into this kingdom, except by or with the consent of the proprietor of the copyright thereof.

Much that is unsatisfactory in copyright law would have terminated had the Bill introduced in the House of Lords by Lord Monkswell been suffered to become law; but it was unfortunately crowded out.

It is a fraud for a man to attach his name or monogram to a picture, whether photograph, painting, or drawing, when such has been executed by another. On this subject the law is very explicit. It is not an uncommon thing for artists of a certain class, either when overburdened with work or from inability to grapple successfully with certain work involving a special knowledge of details in it, to farm out orders of this class, ultimately

attaching their own names as the producers. This constitutes a fraud within the meaning of the Act.

In like manner it would be a fraud were a photographer to attach his name to a picture as its *producer* when it was taken by an *employé*, even if the latter had assigned his copyright to his employer. There is a distinction between the producer of a photograph and the employer who holds the copyright of it. While by the existing law this distinction between employer and employed, as regards copyright, has given rise to litigation, there would have been no uncertainty whatever about the matter if Lord Monkswell's Bill of three years ago had been passed, for in one of the clauses it provides that, if any person "employs another as his assistant or workman to work for him for salary, wages, or hire, for the purpose of executing, making, or taking any work of fine art or any photograph, the copyright in such work or photograph shall belong to the employer."

Suppose a copyright picture is given to a photographer, with instructions to reproduce it, on whom does the onus of pirating it lie? If it is a photograph which bears no indication or mark of having been made copyright, the photographer should have a memorandum from the person by whom he is employed absolving him from all risks. In America, copyright photographs are usually marked as such, and any one pirating one of them does so with his eyes open.

THE COMPOSITION OF TONED POSITIVE IMAGES.

It is usually assumed that the positive image toned with either gold or platinum consists partly of silver and partly of the substituted metal derived from the toning solution, the relative proportions, of course, depending upon the length of time the toning process is allowed to proceed. In fact, it has been supposed that, in the case of a deeply printed proof from a strong negative, where the toning has been carried to the deep rich black obtainable under such circumstances, the image may consist practically of gold alone. However, from observations made in the course of some recent printing experiments, we have had reason to doubt the truth of the supposition, or, at least, whether the image necessarily contains any considerable percentage of gold, whatever its colour may be.

In the case of some experiments recorded some eight or ten years ago by Messrs. W. K. Burton and A. P. Laurie, the investigators attempted to show that an image consisting entirely of gold, or nearly so, need not necessarily present the black or purple tone that is usually associated with the gold or platinum-toned image. On the contrary, they submitted silver prints—on albumen paper, if we recollect rightly—to the action of a gold toning bath for a very considerable time, until, although the colour had not passed a reddish-brown, these tests showed that the whole of the silver originally present had been displaced by gold. We may, however, state at once that we cannot accept the test applied in that case as a conclusive one.

It consisted in submitting the prints to the action of a strong solution of mercuric chloride, which, as most of our readers are aware, will entirely bleach and cause to disappear an untoned image. On this principle the so-called "magic photographs" are made; a deeply printed proof is passed through the fixing bath, without any previous toning, and, after a thorough washing to remove the hyposulphites, it is immersed for a short time in a solution of bichloride of mercury, after which it presents the appearance of a perfectly blank piece of paper until again treated with a weak solutio of hypo, ammonia, or any of the numerous substances employe as the final application in mercurial intensification. Th process is, indeed, identical with the ordinary method c negative intensification.

Messrs. Burton and Laurie's contention is that, in treating th gold-toned image in the manner they did with mercuric chloride the silver image, if any remained, would be entirely removed and, therefore, that any picture that remained after such treatment must necessarily consist of the nobler metal—gold and, as in the case of the reddish images alluded to, no chang was wrought, or practically none, they assumed that they were entirely composed of gold. Without denying that such may have been the case, and writing as we are from recollection, w do not remember whether other means were taken to verify th results, but we shall attempt to show that the conclusions arrived at are by no means necessarily accurate.

The circumstances to which we shall have to allude are as follows:—A number of gelatino-chloride prints had been toned in a new gold bath, in a partly experimental way, to try the bath, but turned out very unsatisfactory in colour, having much of the appearance mentioned in connexion with Messrs Burton and Laurie's prints. With a view of saving the pictures, which were otherwise all right, they were placed in a solution of mercuric chloride, to bleach them, the intention being to redevelop them with amidol or hydroquinone, in the hope of getting better tones, according to the plan described in these columns some two or three years ago.

To our surprise, however, the colour of the prints was little, if at all, altered by the mercury bath, although its action was allowed to continue for a couple of hours or more. They were then washed very thoroughly, and again treated with the solution of bichromate of potash and hydrochloric acid, as well as with solution of cupric chloride, but with no further result, and finally they were digested in dilute *aqua regia*, until the gelatine surface was destroyed, and yet the colour did not appear to be appreciably affected.

Assuming that the images had been wholly converted into gold, it is quite intelligible that the first three solutions employed should fail to bring about any change, but not so in the case of the *aqua regia*, which, when applied to other prints both on an albumen and a gelatine basis, and toned with gold caused the removal of the image before the surface of the prints was destroyed. Therefore it could only be assumed that the image which defied removal was not composed of gold, or at any rate of metallic gold, as we are in the habit of believing. What, then, could be its composition, for it is equally certain that it did not consist of metallic silver?

The only reasonable explanation that seemed to present itself was that the pictures had undergone some form of sulphur toning—the bath had been one of sulphocyanide—and that the image consisted mainly, if not wholly, of sulphide of silver, a substance that, although not very pleasing in colour, has the undoubted merit of permanence where once formed.

Before proceeding any further in the matter, a fresh lot of prints were toned in a precisely similar bath of sulphocyanide and gold, and tones of a like character were obtained, although in this case, owing most probably to the action not having been continued so long, the conversion of the image was not so complete. The solution, bichloride of mercury, caused a distinct alteration in colour, showing that some silver remained behind, while the *aqua regia* produced a still further weakening

to prove that, in this instance, the gold had acted to some extent. But there remained, after all, a brownish image that resisted all attempts at removal short of destruction of the surface.

Being desirous to thoroughly test the sulphuration theory, a combined toning and fixing bath was prepared upon the good old plan of forty years ago by adding some solution of nitrate of silver to the hypo bath, shaking well, and filtering, after which some clippings of prints were left in the solution for an hour or two. Here was a bath calculated to bring about sulphur toning in its most aggravated form, and when put to the test it did not fail. The prints on immersion took at first the yellowish brown colour that hypo gives to an untoned image, but in the course of some hours the tone changed to a not unpleasing brown or sepia, with, in one or two instances, a faint suspicion of purple. Before further treatment, the proofs were very carefully washed, to remove all traces of free hypo or other soluble matter.

On submitting these prints to the same treatment already described, their behaviour was precisely similar to the first lot It would be, perhaps, not strictly correct to say that no change. at all was produced by the bichloride solution, but it was so slight as to be not worth taking into account. The *aqua regia*, too, changed the colour very slightly, but caused no loss of strength—in fact, practically left the picture as it was, and obviously, in this case, there could not be the least question as to the presence of gold.

The experiments were repeated with both gelatine and albumen paper, with slight variations, but with scarcely any alteration of results, except such as could be directly traced to more or less prolonged action of the toning solution, so that it may be fairly assumed that the toned image does not neces sarily consist of metallic gold, either wholly or in part. That it consists wholly, or to any material extent, of sulphide of silver, is not probable in the majority of cases of toning, but that sulphur toning is very frequently employed at the present day is more than probable.

Provided that the result obtained, as regards tone and purity of the whites, is satisfactory, there is no reason why sulphur toning should not be adopted in preference to gold, at least on the score of permanence, for, as we have already said, sulphide of silver is one of the most permanent substances we have. The difficulty with regard to sulphuration and the formation of sulphide of silver is that they occur in the wrong place—in the whites of the picture—or that they proceed gradually, to the detriment and destruction of the image ; but, if the silver forming the picture can be legitimately converted at the outset into unchangeable sulphide of silver of a satisfactory tone, then, we doubt not, many photographers will adopt the new method in preference to gold, especially for gelatine papers.

THE FLEXIBILITY OF GLASS.

Attention was directed, at a recent meeting of the Photographic Club, to a characteristic in some kinds of the new glass, produced at the Jena factory, that may not be generally known to many users of lenses in which it is employed, namely, its extreme softness as compared with most other glasses. Mr. Bynoe pointed out that great care should be taken in screwing lenses (in which these soft varieties are employed) in their cells, not to screw them up too tightly or the instrument may be impaired. The warning is an opportune one, seeing that some of the Jena glasses are employed in so many lenses of modern manufacture.

This advice applies as well to lenses other than those in which the new glass is used, though in a minor degree. In former times opticians were not so particular as to the mounting of their lenses as they are now. Sometimes the glasses were permanently burnished so tightly in the cells that considerable pressure was exerted on the glass, often to the material detriment of the instrument. Now, however, more importance is attached to this matter, and as a rule, when the glasses are burnished, instead of being screwed in the cells, care is taken that no undue pressure is put upon them. Indeed, some makers now leave the lenses so free that they can easily be rotated in the mount. With screw cells mischief may inadvertently be done, when the lenses are taken out, if the rim or collar be screwed up so tight that considerable stress is put upon the glass, particularly if the cell be a little out of truth. The lenses should be left so loose that they can be rotated with little force ; then, should there be a little inequality in the cell, no trouble will result. Not only may the figure of a lens be altered by pressure, but the molecular condition of the glass may also be influenced, and much to its disadvantage. It is an old lecture experiment with the lantern polariscope to show the effect that stress has upon glass. A piece of glass is placed in the instrument, and, while the image is on the screen, pressure is applied in different directions, and the effect produced is always astonishing to those who see it for the first time.

We have, in connexion with this subject, several times called attention to an often-unexpected cause of deterioration in the quality of a lens resulting from an injury to the mount. When a lens has been accidentally dropped, the first thought is of the glasses ; if they be unbroken, it is considered that no damage has been sustained. "It has only dented the mount a bit, but that don't matter," we once chanced to hear when we saw a camera upset on some rocks. Now, it is quite possible that the denting of the mount did materially interfere with the after-performance of the instrument, unless it was repaired. A year or two back, when in a photographic studio, we happened to take up an old lens of the rapid type, and we were at once told it was a "duffer." As it bore the name of a well-known house, we looked at it a little more closely, and found that from continual rough usage the mount had become dented in several places ; the cell of the front combination to such an extent that it would be a surprise to any one conversant with the subject if such an instrument did work satisfactorily.

At the meeting above referred to, one of the members, speaking of the flexion of glass, made mention of a reversing mirror that had originally been mounted in a wooden setting, and purposely left a little loose to ensure that it was perfectly free from pressure, which, because the angle was a trifle out of the 45° had been remounted in a rigid brass frame and firmly fixed in with metal screws. The result was described as "chaos." However, when a screw-driver was requisitioned and the pressure on the glass relieved, the mirror was again rendered serviceable. We may here, now that reversing mirrors are—owing to the extension of photo-mechanical work—being more extensively used than ever, once more emphasise what has been said before, namely, that the glass should always be mounted in such a way that no pressure, however slight, is exerted on any part of it. The larger the mirror, the greater should be the care taken in this respect.

Glass is one of the most elastic of substances. It may be

bent considerably, and, when relieved, it will quickly regain its original form. It may be a question, however, if, with a very prolonged pressure, this is absolutely the case. Say, for example, with the mirror referred to, if it had been kept inflected for a number of years before it was released, would it have regained its pristine plane surface? As illustrating the flexibility of glass, it may be mentioned that one of the great difficulties with large glass specula, in telescopes, is that of mounting them so that their own weight does not alter the figure, notwithstanding that the glass may be several inches thick.

Luminosity of a Candle Flame.—One of the often-advanced objections to the use of a candle as a source of light for comparative purposes is the difficulty in obtaining the light uniform and regular in character; but the greater part of this objection falls to the ground if some recent experiments prove to be correctly reported. In a recent number of *Wiedemann's Annalen*, Herr P. Glau describes experiments he has been making on the relative luminosity of flames from various sources, and he has arrived at the remarkable conclusion that the size of the flame is the only factor in the matter—that, indeed, the actual luminosity is directly proportional to the area of the flame.

A New Light-sensitive Iron Salt.—A remarkable modification of ferrous sulphate sensitive to light is described in a recent number of the Journal of the Russian Chemical Society. When a very weak electrical current is passed, in the dark, for a month or two through a thirty per cent. solution of this salt, iron electrodes being employed, a great change takes place in its physical characteristics. It becomes more intensely green in colour, and when it is exposed to light deposits a green solid which is quite permanent if air be excluded. When analysed the solution is found to contain twice as much iron as there is in the unchanged sulphate. The explanation is that it contains a basic salt, $FeSo_4,FeO$, which decomposes on exposure to light with deposition of $Fe(OH_2)$, coloured green by some ferrous sulphate carried down at the time of precipitation.

Test for Nitrites.—At one time considerable importance was attached to the presence of nitrite in nitrate of silver solutions, many of the well-known abnormalities of the silver bath being attributed to its presence. Though the wet process is now worked by comparatively few persons, it will be interesting to them to learn how to detect the presence of this impurity. Professor Odo Bujwic points out indol for the purpose as a very sensitive, beautiful reagent. An alcoholic solution of ·01 or ·02 per cent. is diluted with water, and a few drops added to about ten centimetres of the suspected solution, previously adding a few drops of hydrochloric acid, and finally heating to 70° or 80° Centigrade. At once the presence of nitrites is indicated by the production of a fine red colour, which increases in intensity for a few minutes.

Test for Free Sulphur.—A new test is described by Herr J. C. Gil in a German technical journal. On adding an alkali polysulphide or a solution of sulphur in caustic alkali to hot alcohol which has been boiled long enough for all air to be expelled, a blue colour is gradually developed. On cooling, the blue colour disappears, but is restored by reheating if care be taken to exclude oxygen or any substance which decomposes polysulphides. So small a quantity as two-fifths of a milligramme of hepar sulphuris will colour fifty cubic centimetres of ninety-six per cent. alcohol. To use the test for the detection of free sulphur, the substance is added to boiling alcohol containing a trace of caustic potash. It is evident that there is here a very simple mode of examining prints for the presence of free sulphur, which by many is supposed to be one condition in which that element is found in prints "toned by sulphurisation," whatever that mysterious operation may eventually prove to be.

New Mode of Colouring Scientific Lantern Slides.—At a recent meeting of the Royal Society of Dublin, the President (Sir Howard Grubb), in the chair, Dr. J. Alfred Scott described a method he had devised for colouring lantern slides for scientific or other purposes, apparently referring to photographic slides. The author explained that the gelatine surface should be made wet, and then drained, and when in this damp condition is in a highly suitable state for receiving aniline dyes, laid on in aqueous solutions with a camel's-hair pencil, the depth of tint depending on the strength of the solution and the length of time it remains on the gelatine surface. He found that eosine, tartrazin yellow, vesuvin, and indigo-carmine were the most suitable dyes, especially as they could be mixed, and compound colours formed without chemical decomposition among the "paints." With regard to eosine, however, it should be used stronger than is really required for optical purposes, as it is liable to become reduced in intensity if the slide be often used. When inks, suitable for using with a writing pen, are wished for, Dr. Scott recommends the aniline colour solutions, with ten per cent. of dextrine, eosine and iodine green being good for the purpose, and for black, "encre-noir," made slightly alkaline with ammonia, and similarly thickened.

THE COPYRIGHT (WORKS OF ART) ACT.

An Act for amending the Law relating to Copyright in Works of the Fine Arts, and for Repressing the Commission of Fraud in the Production and Sale of such Works.

WHEREAS by law, as now established, the authors of paintings, drawings, and photographs have no copyright in such their works, and it is expedient that the law should in that respect be amended: Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Copyright in Works Hereafter Made or Sold to Vest in the Author for his Life and for Seven Years after his Death.

1. The author, being a *British* subject or resident within the dominions of the Crown, of every original painting, drawing, and photograph which shall be or shall have been made either in the *British* dominions or elsewhere, and which shall not have been sold or disposed of before the commencement of this Act, and his assigns, shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing, and the design thereof, or such photograph, and the negative thereof, by any means and of any size, for the term of the natural life of such author, and seven years after his death; provided that when any painting or drawing, or the negative of any photograph, shall for the first time after the passing of this Act be sold or disposed of, or shall be made or executed for or on behalf of any other person for a good or a valuable consideration, the person so selling or disposing of or making or executing the same shall not retain the copyright thereof, unless it be expressly reserved to him by agreement in writing, signed, at or before the time of such sale or disposition, by the vendee or assignee of such painting or drawing, or of such negative of a photograph, or by the person for or on whose behalf the same shall be so made or executed, but the copyright shall belong to the vendee or assignee of such painting or drawing, or of such negative of a photograph, or to the person for or on whose behalf the same shall have been made or executed; nor shall the vendee or assignee thereof be entitled to any such copyright, unless, at or before the time of such sale or disposition, an agreement in writing, signed by the person so selling or disposing of the same, or by his agent duly authorised, shall have been made to that effect.

Copyright not to Prevent the Representation of the Same Subjects in Other Works.

2. Nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding that there may be copyright in some representation of such scene or object.

Assignments, Licenses, &c., to be in Writing.

3. All copyright under this Act shall be deemed personal or moveable estate, and shall be assignable at law, and every assignment thereof, and every license to use or copy by any means or process the design or work which shall be the subject of such copyright, shall be made by some note

or memorandum in writing, to be signed by the proprietor of the copyright, or by his agent appointed for that purpose in writing.

Register of Proprietors of Copyrights in Paintings, Drawings, and Photographs to be kept at Stationers' Hall, as in 5 & 6 Vict., c. 45.

4. There shall be kept at the Hall of the Stationers' Company, by the Officer appointed by the said Company for the purposes of the Act passed in the sixth year of Her present Majesty, intituled *An Act to Amend the Law of Copyright*, a book or books, entitled "The Register of Proprietors of Copyright in Paintings, Drawings, and Photographs," wherein shall be entered a memorandum of every copyright to which any person shall be entitled under this Act, and also of every subsequent assignment of any such copyright; and such memorandum shall contain a statement of the date of such agreement or assignment, and of the names of the parties thereto, and of the name and place of abode of the person in whom such copyright shall be vested by virtue thereof, and of the name and place of abode of the author of the work in which there shall be such copyright, together with a short description of the nature and subject of such work, and in addition thereto, if the person registering shall so desire, a sketch, outline, or photograph of the said work, and no proprietor of any such copyright shall be entitled to the benefit of this Act until such registration, and no action shall be sustainable nor any penalty recoverable in respect of anything done before registration.

Certain Enactments of 5 and 6 Vict., c. 45, to Apply to the Books to be Kept under this Act.

5. The several enactments in the said Act of the sixth year of Her present Majesty contained, with relation to keeping the register book thereby required, and the inspection thereof, the searches therein, and the delivery of certified and stamped copies thereof, the reception of such copies in evidence, the making of false entries in the said book, and the production in evidence of papers falsely purporting to be copies of entries in the said book, the application to the Courts and Judges by persons aggrieved by entries in the said book, and the expunging and varying such entries, shall apply to the book or books to be kept by virtue of this Act, and to the entries and assignments of copyright and proprietorship therein under this Act, in such and the same manner as if such enactments were here expressly enacted in relation thereto, save and except that the forms of entry prescribed by the said Act of the sixth year of Her present Majesty may be varied to meet the circumstances of the case, and that the sum to be demanded by the officer of the said Company of Stationers for making any entry required by this Act shall be one shilling only.

Penalties on Infringement of Copyright.

6. If the author of any painting, drawing, or photograph in which there shall be subsisting copyright, after having sold or disposed of such copyright, or if any other person, not being the proprietor for the time being of copyright in any painting, drawing, or photograph, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution, or cause or procure to be repeated, copied, colourably imitated, or otherwise multiplied for sale, hire, exhibition, or distribution, any such work or the design thereof, or, knowing that any such repetition, copy, or other imitation has been unlawfully made, shall import into any part of the United Kingdom, or sell, publish, let to hire, exhibit, or distribute, or offer for sale, hire, exhibition, or distribution, or cause or procure to be imported, sold, published, let to hire, distributed, or offered for sale, hire, exhibition, or distribution, any repetition, copy, or imitation of the said work, or of the design thereof, made without such consent as aforesaid, such person for every such offence shall forfeit to the proprietor of the copyright for the time being a sum not exceeding ten pounds; and all such repetitions, copies, and imitations, made without such consent as aforesaid, and all negatives of photographs made for the purpose of obtaining such copies, shall be forfeited to the proprietor of the copyright.

Penalties on Fraudulent Productions and Sales.

7. No person shall do or cause to be done any or either of the following Acts; that is to say,—

First, no person shall fraudulently sign or otherwise affix, or fraudulently cause to be signed or otherwise affixed, to or upon any painting, drawing, or photograph, or the negative thereof, any name, initials, or monogram:

Secondly, no person shall fraudulently sell, publish, exhibit, or dispose of, or offer for sale, exhibition, or distribution, any painting, drawing, or photograph, or negative of a photograph, having thereon the name, initials, or monogram of a person who did not execute or make such work:

Thirdly, no person shall fraudulently utter, dispose, or put off, or cause to be uttered or disposed of, any copy or colourable imitation of any painting, drawing, or photograph, or negative of a photograph, whether there shall be subsisting copyright therein or not, as having been made or executed by the author or maker of the original work from which such copy or limitation shall have been taken.

Fourthly, where the author or maker of any painting, drawing, or photograph, or negative of a photograph, made either before or after the passing of this Act, shall have sold or otherwise parted with the possession of such work, if any alteration be afterwards made therein by any other person, by addition or otherwise, no person shall be at liberty, during the life of the author or maker of such work, without his consent, to make or knowingly to sell or publish, or offer for sale, such work or any copies of such work so altered as aforesaid, or of any part thereof, as or for the unaltered work of such author or maker.

Penalties.

Every offender under this section shall, upon conviction, forfeit to the person aggrieved a sum not exceeding ten pounds, or not exceeding double the full price, if any, at which all such copies, engravings, imitations, or altered works shall have been sold or offered for sale; and all such copies, engravings, imitations, or altered works shall be forfeited to the person, or the assigns, or legal representatives of the person, whose name, initials, or monogram shall be so fraudulently signed or affixed thereto, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as aforesaid: Provided always, that the penalties imposed by this section shall not be incurred unless the person whose name, initials, or monogram shall be so fraudulently signed or affixed, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as beforesaid, shall have been living at or within twenty years next before the time when the offence may have been committed.

Recovery of Pecuniary Penalties.

8. All pecuniary penalties which shall be incurred, and all such unlawful copies, imitations, and all other effects and things as shall have been forfeited by offenders, pursuant to this Act, and pursuant to any Act for the protection of copyright engravings, may be recovered by the person herein-before and in any such Act as aforesaid empowered to recover the same respectively, and herein-after called the complainant or the complainer, as follows:

In *England* and *Ireland*, either by action against the party offending or by summary proceeding before any two Justices having jurisdiction where the party offending resides:

In *Scotland*, by action before the Court of Session in ordinary form, or by summary action before the Sheriff of the County where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending, or by the oath or affirmation of one or more credible witnesses, shall convict the offender, and find him liable to the penalty or penalties aforesaid, as also in expenses, and it shall be lawful for the Sheriff, in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding: Provided always, that it shall be lawful to the Sheriff, in the event of his dismissing the action and assoilzieing the defender, to find the complainer liable in expenses, and any judgment as to be pronounced by the Sheriff in such summary application shall be final and conclusive, and not subject to review by advocation, suspension, reduction, or otherwise.

Superior Courts of Record in which any Action is Pending may Make on Order for an Injunction, Inspection, or Account.

9. In any action in any of Her Majesty's Superior Courts of Record at *Westminster* and in *Dublin*, for the infringement of any such copyright as aforesaid, it shall be lawful for the Court in which such action is pending, if the Court be then sitting, or if the Court be not sitting then for a Judge of such Court, on the application of the plaintiff or defendant respectively, to make such order for an injunction, inspection, or account, and to give such direction respecting such action, injunction, inspection, and account, and the proceedings therein respectively, as to such Court or Judge may seem fit.

Importation of Pirated Works Prohibited.—Application in such Cases of Customs Act.

10. All repetitions, copies, or imitations of paintings, drawings, or photographs, wherein or in the design whereof there shall be subsisting copyright under this Act, and all repetitions, copies, and imitations of the design of any such painting or drawing, or of the negative of any such

photograph, which, contrary to the provisions of this Act, shall have been made in any Foreign State, or in any part of the *British* dominions, are hereby absolutely prohibited to be imported into any part of the United Kingdom, except by or with the consent of the proprietor of the copyright thereof, or his agent authorized in writing; and if the proprietor of any such copyright, or his agent, shall declare that any goods imported are repetitions, copies, or imitations of any such painting, drawing, or photograph, or of the negative of any such photograph, and so prohibited as aforesaid, then such goods may be detained by the Officers of Her Majesty's Customs.

Saving of Right to Bring Action for Damages.

11. If the author of any painting, drawing, or photograph, in which there shall be subsisting copyright, after having sold or otherwise disposed of such copyright, or if any other person, not being the proprietor for the time being of such copyright, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply, or cause or procure to be repeated, copied, colourably imitated, or otherwise multiplied, for sale, hire, exhibition, or distribution, any such work or the design thereof, or the negative of any such photograph, or shall import or cause to be imported into any part of the United Kingdom, or sell publish, let to hire, exhibit, or distribute, or offer for sale, hire, exhibition or distribution, or cause or procure to be sold, published, let to hire, exhibited, or distributed, or offered for sale, hire, exhibition, or distribution, any repetition, copy, or imitation of such work, or the design thereof, or the negative of any such photograph, made without such consent as aforesaid, then every such proprietor, in addition to the remedies hereby given for the recovery of any such penalties, and forfeiture of any such things as aforesaid, may recover damages by and in a special action on the case, to be brought against the person so offending, and may in such action recover and enforce the delivery to him of all unlawful repetitions, copies, and imitations, and negatives of photographs, or may recover damages for the retention or conversion thereof: Provided that nothing herein contained, nor any proceeding, conviction, or judgment, for any act hereby forbidden, shall affect any remedy which any person aggrieved by such Act may be entitled to either at law or in equity.

Provisions of 7 & 8 Vict., c. 12, to be Considered as Included in this Act.

12. This Act shall be considered as including the provisions of the Act passed in the Session of Parliament held in the seventh and eighth years of Her present Majesty, intituled *An Act to Amend the Law relating to International Copyright*, in the same manner as if such provisions were part of this Act.

SILVER IN COMMERCIAL GELATINO-BROMIDE PLATES.

[London and Provincial Photographic Association.]

We have great pleasure in presenting to you, in accordance with the request made by the Committee, the results of our investigation into the amounts of silver contained in plates of different makers. The majority of the plates were purchased towards the close of 1892, so that it is more a record of the silver contained in plates of the past than it those of the present.

It is to be distinctly understood that we do not wish it to be inferred that, because a plate contains only a small amount of silver, it is necessarily bad. There are certain qualities of a plate which depend on the amount of silver, but others, again, are independent, within certain limits, of any variation in the amount.

Quarter-plates are usually coated as whole-plates, and then cut up; we have, therefore, only been able to obtain the average silver on three whole-plates. Although the plates are coated by machinery, yet it is impossible, we think, to lay the emulsion on them absolutely uniform in all cases, and therefore some of the numbers obtained may be a little above what it would be if the emulsion had been evenly distributed, and for the same reason some probably are below the average.

It is not the quantity of paint on a picture that determines its value, but the skill with which it is used.

The object of the research was not to find out which plate-maker gave you the largest or the smallest quantity of silver for your money, but in order that we might know what we are dealing with; and, in many other cases, it would be equally valuable could we be made acquainted with the composition or the exact percentage value of the active ingredients in many of the chemicals we use in the different branches of photography. We purchase ammonia professedly of sp. gr. ·880, but how often does it reach this value? Sulphite of soda, again, when sold as such, how much carbonate of soda and how much sulphite does it contain? Chloride of gold—how often is it up to standard? And so on with most of the other compounds.

The method we have adopted is different from that which was given in *Photographic Work*, May 12, 1892, by M. M. E. Demole, as we thought more exact results could be obtained by the process we have used than by that employed in the paper mentioned.

The plates, on removal from the packages, were soaked in water for about a quarter of an hour, so as to thoroughly swell the gelatine (the number of plates dealt with in each case was six quarters); the films were then completely scraped off by means of a spatula, and transferred to a breaker containing a small quantity of water. Five cubic centimetres of strong hydrochloric acid were added to the contents, and the breaker placed on a sand bath, in order to destroy the gelatine. Heat was applied till all the water had evaporated; the silver salts were then treated with 10 c.c. of a mixture of pure nitric and hydrochloric acids, in the proportion of one of the former to two of the latter, the nascent chlorine displacing all the bromine and iodine in combination with the silver, and leaving chloride of silver. In order to ensure the complete replacement of bromine and iodine by chlorine, this was repeated a second, and, in some cases, a third time, till the precipitate of silver chloride was white. About 50 c.c. of water were then added, and made acid with a few drops of nitric acid. The precipitate was then transferred to a filter, washed, dried, incinerated, and then weighed.

From the weight of silver chloride the amount of metallic silver is easily calculated.

It would have been possible to have determined the ratio of the bromide to the iodide of silver, but the time required to carry this out would have been so largely increased that we were unable to undertake it.

If we take the mean of the amounts of silver on the different brands of ordinary plates, we find that each quarter contains 1·027 grains of metallic silver, and that each plate, when covered with rapid emulsion, has 1·214 grains of silver. Rapid plates, therefore, on an average, contain about twenty per cent. more silver than do the slower or ordinary.

In conclusion, we hope that the results we have obtained will be of use generally, and more especially to plate-makers, as it will enable them to see what their brother plate-makers are doing, and, if possible, to improve their own manufacture.

A. Haddon and F. B. Grundy.

[As it has been considered that it would be somewhat invidious to give the amount of silver in the plates of the various makers, we have omitted inserting the table.—Ed.]

THE ARTISTIC ASPECT OF PHOTOGRAPHY.

[Woodford Photographic Society.]

To give a definition of art which shall be sufficiently distinctive and, at the same time, sufficiently comprehensive, is a matter of some difficulty. In view, however, of the particular branch of art with which we have to do this evening, we may be fairly safe in saying that art is the employment of means to produce or reproduce beauty. Some forms of beauty affect the senses only, but the higher forms are those which appeal through the senses to the intellect, the imagination, or the emotions. Beauty of this latter class is the object of what are generally termed the fine arts.

The question arises, Is photography entitled to a place among the fine arts? If it produces pictures which please our intellectual, imaginative, or emotional faculties, then I venture to assert that it is entitled to such a place. But painters—who, without any show of right, arrogate to themselves the title of "artists"—say that photography is mechanical and automatic, and therefore it cannot be art. I hope to show, in the course of my paper, that it is not mechanical or automatic, and that it may be made to affect our higher feelings in the way I have described. If I succeed in doing so, it follows that the painters are wrong.

In the first place, let me remark that it is the artist who makes the art and not the reverse. Artists "are born, not made." Unless a man has the root of the matter in him—an inherent love of beauty—no amount of training can make him an artist. Nevertheless, I do not say that training would be valueless in any case. It would, at least, have a deterrent effect, preventing a man from producing work which would be absolutely hideous, and, at the same time, it would enable him to appreciate the work of true genius. On the other hand, the man who possesses this true genius is the least bound down by the so-called rules of art; while perfectly familiar with them, he yet makes them subservient to his purposes.

Those I am addressing are, I am sure, possessed of some degree of artistic taste. The mere fact that they have taken up photography shows this. At the outset, then, to such as desire to invest their pictures with artistic merit, I would say, Be original, and produce characteristic work; not by transgressing the laws of art so much as by making them obey you. Photography has its place among the fine arts, but while not superseding or competing with any of them, it has its own special qualities and powers; do not attempt, therefore, to accomplish by it anything outside its proper sphere.

I mention this because there are a number of photographers—appropriately nicknamed the "fuzzy school"—who insist on diffused focus as the particular essential of an artistic picture, and affect to despise sharpness, as being inartistic and "topographical." My own feeling is, that every one has a perfect right to his own preferences and opinions in such matters. I generally prefer the clear, well-defined photograph, as being more true to nature, but I am not so bigoted as to be unable to admire the softness, and even beauty, of some pictures of the other class. No artist has a right to say, "My style of working is absolutely the only correct one, and you *must* admire it." We need not admire what we do not like—there is no compulsion in the matter. But, while allowing this liberty of opinion, I also claim the right to show why I differ from others. I have therefore thought it well, in opening this discussion, not only to mention some of the artistic possibilities of photography, and some of its impossibilities, but also to state my reasons for disagreeing with the opinions of certain others on the question.

The Limitations of Photography.

Dealing first, and briefly, with the limitations of photography, I will just say that there are some kinds of pictures—such as are often seen in our galleries, and are justly admired—which could not possibly be produced by means of the camera. I mean pictures of purely ideal subjects, and historical pictures, sacred or otherwise, whose arrangement can only have proceeded from the painter's imagination. Photography has to do solely with the present and the real. Even when, by the use of specially dressed figures and carefully arranged accessories, an endeavour is made to represent some historical or similar incident, the result only proves how unequal photography is to the task imposed upon it; the artificiality and constraint are too apparent. There are also some actual scenes which cannot be adequately represented by photographic methods. A broad, far-stretching plain, smiling with peace and plenty, bathed in glorious sunshine, and overarched by a cloudless canopy of blue—this, though in itself beautiful and enjoyable, would never make a good photograph. The chief reason for this is, I think, the impossibility of reproducing the natural colours; but, does not the fact that the photograph only represents (and that but partially) the effect of the view on *one* of the senses—that of sight—have something to do with its failure? The exhilarating breeze, the warmth of the sunshine, the scent of the heather on the hillside around us, the songs of the birds in the woods just below, the companionship of a friend—do not such things influence us in our appreciation of such a view? Yet, they are all necessarily absent from the photograph. Such limitations as these are, of course, of general applicability to most of the graphic arts, but they do not always equally affect the results. On the contrary, we can, in some photographs of well-chosen subjects, realise, with scarcely any difficulty, the true impression of the original scene upon the mind of the beholder.

One of the necessities, therefore, of the would-be artistic photographer is a knowledge of what *not* to attempt. Much of this knowledge can be gained from failures, but it is better to learn in a less costly manner. The ability to select a view, or a part of it, and to make the best of the selection, is the chief preliminary qualification required. It will give the photographer the power of forming a picture which shall be "a thing of beauty," even out of the most commonplace materials. There are many scenes which we unhesitatingly pronounce beautiful at first sight; but it seldom follows that our first view-point is the best from which to take a photograph. To secure a well-arranged picture we must choose the best view-point; and this choice will be facilitated by a remembrance of the more important rules of composition. These rules are somewhat arbitrary, and unless wisely applied tend to repetition and sameness, things which it is very important we should avoid. But, while I hold the opinion that if followed too slavishly these "laws" defeat their own purpose, yet I believe they can be helpful if properly kept under control.

Composition and Balance.

Composition, according to the dictionary, is "that combination of parts in which each has its due proportion," or, in other words, that method of arranging objects in a picture which will convey the greatest pleasure and the most truthful impression to the mind of the person who sees it, and which will lead him, *insensibly*, to pay the greatest attention to the chief point of interest.

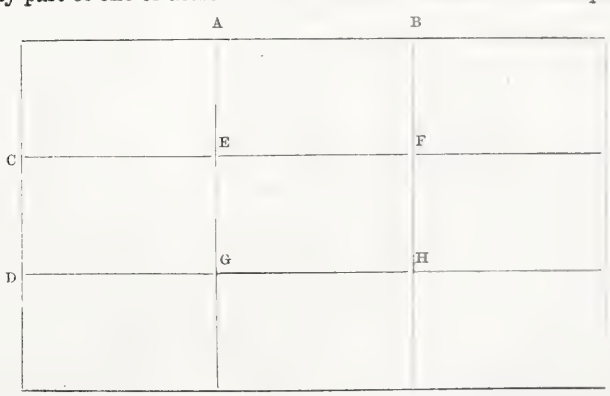
But before commencing the arrangement of the picture, it is necessary to select it. "First catch your hare," says the old cookery-book. In the first place, then, do not include too much in the view. Simplicity is one of the chief characteristics of a successful photographic picture. Let the view include one subject only, and, if possible, let that subject be one which will make itself evident in the finished print apart from any written title. Leave out everything which is irrelevant to the subject, so that every detail shall contribute to the general effect. In a perfect picture each high light, each shadow, and each line will be essential to its beauty, and not one can be dispensed with. Thus it follows of necessity that multiplicity of details (I do not refer to sharpness of focus, which is a different matter) must be avoided.

Having found a subject which seems to possess the elements of beauty, we then proceed to discover the best point of view from which to photograph it. In doing so, there are two points to be considered: (1) the best angle at which to take it, and (2) the most suitable distance; and it will save us much time, as well as prevent many failures, if we bear in mind the following general rules. The name given to them is "The Rules of Composition," though composition, properly so called, is not within the limits of pure photography. They are of use, however, as suggestions for the most effective arrangement of the objects comprised in any given view.

The position of the principal object is of the greatest importance. On first thoughts, it would seem natural to suppose that the best place for it would be the centre of the picture, but this is not the case. A careful examination of any number of good pictures will reveal the fact that, in all the most successful ones, the chief object is a little either to the right or left of the centre, and on a line either above or below it. It is not easy to say *why* this should be the case, but the fact is indisputable.

The following diagram is a most useful one to carry in the memory, as it shows all the principal points to be considered in the arrangement of a view. Some recommend that these lines should be ruled on the focussing screen, but I think this is not advisable, as it is liable to militate against variety of treatment.

The lines A, B, C, and D divide the space with which it is proposed to occupy the picture into three equal parts each way. An object occurring on any part of one of these lines well attract attention in consequence of



its position, but the places where the lines intersect (E, F, G, H) are the strongest points of all. On one of these, therefore, the principal object, or the most prominent part of it, should be placed. The whole of the object may perhaps be too large to be concentrated in so small a part of the view as that surrounding one of these intersections, but in such a case it may occupy the greater portion of the length of one of the upright lines A and B. No other prominent object may be placed in a similar position on the other side of the picture; that is to say, if object No. 1 is at F, then object No. 2 must not be at E. Object No. 2 must be of less importance than No. 1, and the best place for it is at G; or, if No. 1 be at E, then No. 2 should be at H. Other objects of third-rate interest may be advantageously placed in the middle of any of the nine small rectangles, except the central one, which is the weakest position in the picture. The lines C D are useful as indicating the position of the horizon when it is a prominent feature; C to be used when the foreground predominates, and D when the view is of a more extensive nature, especially in seascapes. As a rule, it is not advisable to run the horizon across the middle, though when it is merely an item in the background its position is not of great importance.

A matter which demands careful attention is the "Balance" of the picture. A few simple rules are: (1) strong lines running in one direction must be balanced by strong lines running in an opposite

direction; (2) diagonal lines must be balanced by vertical or horizontal lines, or by diagonal lines in opposite direction; (3) in the case of a building, more of the picture should be in front than behind. A frequently occurring form in landscape and architectural subjects is that of a wedge; that is to say, the principal outlines form an angle projecting from one side of the picture. To balance the picture, it is necessary to give a so-called "support" to the apex of such an angle, which may be done by means of another angle of less projection, or by a strongly marked vertical object.

Light and Shade.

We will pass now to the consideration of Light and Shade. In the lighting of the subject we have a most important factor, one which cannot be neglected. The composition may be perfect, but, if the lighting is unsuitable, an exposure would be a waste of time. Be careful to remember never to take a view with the sun directly behind the camera, nor—as an *almost* invariable rule—to do so with the sun in front. Nearly every position between these two will give a passable result, but there is for each individual subject just the one lighting which best suits it, and no other.

The great point in choosing the time of day is to secure that effect of light and shade which most helps to emphasise the composition, and which most conduces to breadth of effect. There should be few high lights, the greater part of the picture consisting of half-tones and shadow. If a scattering of bright spots in one portion of the view is unavoidable, an object placed thereabouts, which concentrates in itself the highest light and the deepest shadow, such as a figure dressed in black with a white apron, will restore the harmony of the picture. Figures in landscapes are often of great value, inasmuch as they can be placed in the most effective positions, and will serve to break the continuity of a painfully straight line or the monotony of a large mass of light or shade; but they should always be small compared with the rest of the view, and should be of such a nature as to harmonise with the whole.

In figure subjects pure and simple, the best arrangement is not always the same as that for landscapes. A single figure, with few accessories, may fill the greater portion of the picture, and may even be in the centre; but, in the case of two or more figures, a more striking effect can be obtained by arranging them so that the principal outlines form an irregular triangle or pyramid. A group of three persons, for instance, should never be placed with their faces in a straight row, nor should the faces form a regular equilateral triangle; placing one of them a little more to the right or left will improve the effect.

I have so far suggested, in perhaps a rather cursory manner, but with sufficient exactness for mere suggestions, what things go towards the making of a picture. Now, my advice is, treat these suggestions as you do a nutshell, which you throw away when the kernel is extracted. Be guided by broad principles rather than by narrow, unbending rules, and your work will be the more characteristic and original. What is the sum and substance of all these rules? Concentrated into a sentence, they all, I think, amount to this: Endeavour to express the *relative distances* and the *relative sizes* of the objects in the view with the greatest possible truthfulness. This may be a somewhat sweeping assertion to make, but I leave it with you for your consideration, and I think you will eventually agree with me that this is the direction in which they all tend.

The after-processes give us opportunities of modifying to a certain extent the results of exposures. Thus, in development, if we want great contrasts, we can use quinol; if we wish for a greater range of half-tones and a general effect of softness, we can get them with pyro. Full exposure with slow development also tends to softness. By "sunning" prints, we can often obtain the desired amount of toning down. The method of printing must depend on one's taste and one's subject. Do not, however, use only one process for all subjects, nor, on the other hand, take up every process you hear of, or you will succeed in none. It is most important for artistic work to possess a fair amount of control over our processes and be well acquainted with their powers and peculiarities.

To do the best work, do not leave the discovery of suitable subjects to chance, but go about with your eyes open beforehand; first choose your view, and then your view-point; then determine if figures are required, of what character, and where to place them; then decide on the time of day which gives the most suitable lighting. More time will be saved and better pictures made this way than if we carry our cameras about with no more definite object than to seize whatever turns up.

The Naturalistic School.

In conclusion, I should like to refer to the teachings of the so-called "Naturalistic" school. In Dr. Emerson's famous book, *Naturalistic Photography*, are given the main arguments on which this school is founded. I am aware that Dr. Emerson has since published a *Renunciation*, but the only thing he renounces therein is the belief in the power of "altering the values by development," which is, for all his recantation, a power as real to-day as it ever was. I do not wish to discuss this point. It is rather the question of "differential focussing" I want to speak on. I will, therefore, take first a description he gives of a scene, and its effect on the beholder. Summarised, it is this:—"Let us imagine a decayed and picturesque wooden landing-stage, projecting beneath an old weeping-willow, on the margin of a lake. An old cottage, with a garden leading up to it, stands well in the background, and stately poplars tower behind that again. On the landing-stage stands a beautiful, sun-bronzed village girl, in a plain print dress; she leans against the old willow trunk, and is gazing pensively into the water. 'We row by on the lake, and are struck by the picture, but above all by the dazzling native beauty of the peasant girl; our eyes are fixed on the ruddy face, and we can look at nothing else. If we are cool enough to analyse the picture, what is it we see directly and sharply? The girl's beautiful head, and nothing else. We are conscious of the willow, of the light dress, of the decaying timbers, of the cottage behind, and the poplars shining blue and misty in the distance—we feel all these, but we see clearly and definitely only the charming face. Thus it is always in nature, and thus it should be in a picture.'"

This well illustrates the principles of the school; and following it up, I will make two more quotations. On page 119 he says: "From what has been previously said, it will now be understood that a picture should not be quite sharply focussed in any part, for then it becomes false; it should be made just as sharp as the eye sees it and no sharper, for it must be remembered that the eye does not see things as sharply as does the photographic lens, for the eye has the faults due to dispersion, spherical aberration, astigmatism, aërial turbidity, blind spot, and beyond twenty feet it does not adjust perfectly for the different planes. . . . . The rule in focussing, therefore, should be focus for the principal object of the picture, but all else must not be sharp, and even that principal object must not be perfectly sharp, as the optical lens will make it. It will be said, but in nature the eye wanders up and down the landscape and so gathers up the impressions, and all the landscape in turn appears sharp. But a picture is not 'all the landscape;' it should be seen at a certain distance—the focal length of the lens used as a rule—and the observer, to look at it thoughtfully, if it be a picture, will settle on a principal object and dwell upon it, and when he tires of this he will want to gather up the suggestions of the rest of the picture."

"Naturalism" Analysed.

The last few words seem to me to be fatal to his own theory; in what way I will endeavour to show. Let us first return to the scene he describes. You will notice that his eyes are focussed clearly and definitely on the charming face of the village girl; *nothing else is seen sharply*. I should like, therefore, to know how he becomes aware of the fact that the tree whose trunk she leans against is a willow, and not any other kind of tree; how he knows that the dress is a plain print one, or that the timbers of the landing-stage are decaying, or that the cottage is a cottage and not an inn or a barn, or that the poplars are shining blue and misty in the distance. Does not his description show that he has looked at each object in turn, and seen each distinctly, or, in his own words, has he not "tired of settling upon" the principal object, "and dwelling upon it," and "gathered up the suggestions of the rest of the picture?"

Undoubtedly it is so. Dr. Emerson evidently wants us to realise the impression on his mind made by the fair face of the girl at the moment he is looking at that; and as a description of the momentary effect his is a fairly correct one. But I venture to say that no one would be so intent upon the principal object of attraction that he would not bestow a glance at anything else. While, however, perfectly aware of these other objects, which have each in turn been focussed sharply upon his retina, he may deem them of so secondary an interest that he endeavours to ignore them, and concentrates his attention on the girl's face. In this effort, you see, he brings his mental powers into play, and if for him the cottage and the poplars have no interest, he need not dwell upon them. He knows they are there, but could almost wish they were not. What, then, more simple in taking the photograph than to take a picture of the girl alone, and leave out these undesirable objects altogether? He can then gaze at the representation of the face which charms him so, with all the distracting surroundings removed, and can stare with his eyes fixed at the desired focus as long as he chooses. "But," say the naturalistics, "we don't want to leave out the cottage, the poplars, the willow, and the landing-stage. They form an appropriate setting for the

figure, and lead the eye up to it, so to speak." Granted; and that gladly. If, therefore, you want to include them, why not represent them as you see them? "We do," is the reply. "Our contention is," says Dr. Emerson, "that a picture should be a translation of a scene as seen by the normal human eye."

Focus Sharply.

How, then, will the "naturalistic" photograph of the scene follow out this theory? Let us examine it. We are at once attracted by the face of the pensive maiden; but we are dimly conscious of other objects in the picture. We turn our eyes from the figure to "gather up the suggestions of the rest of the picture," and what do we see? A blurred mass of lights and shades, in which nothing is distinct. It must not be forgotten here that if the blur in the picture represents the actual effect on the eye of unfocussed objects—the eye which is subject to so many shortcomings—that blur must now be *doubled* in its effect, for it is viewed, in its turn, with the same defective instrument of vision. The chief suggestion, then, of the rest of the picture is that a smaller diaphragm in the lens would have improved matters. The blurred images also seem to say to us, "You must not look at us; please look only at the girl's face." It is something like the style of thing which I have read exists at Matlock where "the beauties of nature are all catalogued, ticketed, and forced on the attention by signboards and handbills. Here is the path to 'the beautiful scenery' (admission so much); there 'the romantic rocks' (again a fee); there the ferry to 'the Lovers' Walk,' and so on. . . . . It would certainly be pleasanter," says the writer from whom I am quoting, "to discover for one's self that here is the Switzerland of England." And, in like manner, I contend, it would be preferable to discover for one's self that the maiden's countenance is the best thing in the picture, than to have the fact thrust upon one. If the picture were "sharp all over," and we were gazing on the chief object, the less important ones would be represented with the same indistinctness as in nature, *until we looked at them*, when they would each in turn, as we focussed our eyes upon them, be seen sharply, as in nature. Therefore, if you wish to secure a natural effect, focus as sharply as possible. Lead the attention to the principal object by means of the composition and lighting, not by dodges of focus, which are obtrusive and unnatural. To sum up, then, absolute truth to nature is the most desirable quality in an artistic photograph. Let us, therefore, study Nature herself, and endeavour to convey true and vivid ideas of what Nature is.

I have, I think, shown that to make a picture by photography requires skill and forethought. Were the process a mechanical one, the suggestions I have thrown out would be wasted. No machine can select or compose a view, focus itself, or judge of the exposure. It is often said that photography is a science; this is true, but it may also be an art in the hands of an artist. It is merely a question of materials. The photographer uses apparatus and chemicals, the painter uses tools and pigments. The photographer's control over his materials may be more difficult, but that is only the more credit to him. Finally, I make bold to assert that many good photographs do appeal to the higher feelings in the way which good paintings do; it is vain to deny it, and I need not before a company of photographers seek to prove it. We cannot help coming to the conclusion that photography has already won its way to a position abreast of the other fine arts, and the time is not distant when it must perforce be recognised as one of them.

Joseph W. Spurgeon.

CAMERA CLUB CONFERENCE.

The Camera Club Conference was opened on Tuesday afternoon last at the Society of Arts, John-street, Adelphi, W.C., the President of the Camera Club (Captain W. de W. Abney) taking the chair. The maximum attendance during the afternoon was about fifty.

The President, in opening the proceedings, excused himself from giving a formal address on the ground that, during the past year, he had given two opening addresses, and that nothing new had since transpired. Remarking upon the absence of Mr. Davison from his accustomed place at the table as Hon. Secretary of the Conference, he complimented him upon the zeal he had always displayed, and regretted his retirement.

Captain E. H. Hills read a paper on *The Photographic Camera as a Portable Observatory*, in which, after referring to the usual methods adopted by surveyors and explorers in finding latitude and longitude, he said that two methods were available for determining longitude by photography. The first was to photograph the lunar distance; a series of instantaneous photographs of the moon when near a bright star being taken, the distances on the plate and the included angle being then measured. By letting the exposure go on for a short time, the star would trace its movement on the plate. By this means the distance from the centre of the moon to a certain star could be measured at definite times. Knowing the focus of the lens and the centre of the plate, great accuracy could be ensured. Captain Hills said that the method gave [illegible] greater accuracy than the use of the sextant. The second method is to have the moon in the centre of the plate, a series of instantaneous exposures being made at short intervals so that the images of the moon should not overlap, then to wait for the constellation, the lens being covered for certain intervals. Both in this and the preceding method reference to the *Nautical Almanac* would be necessary. An ordinary bellows camera and tripod were apt to shake, and a camera formed of telescopic metallic tubing on trunnions and a solid tripod base would be preferable. Captain Hills showed several slides of star trails in illustration of his paper.

Mr. T. R. Dallmeyer, in complimenting Captain Hills on his paper, said it illustrated what a valuable instrument the camera is. There had been many methods of determining the focus of a lens advocated, and he thought the one mentioned by Captain Hills of photographing a star track at measured intervals of time would become a valuable addition to the methods already employed.

A vote of thanks was passed to Captain Hills.

A Royal Academician on Art and Photography.

Mr. W. F. Yeames, R.A., read a paper, in which, after briefly considering how far the one art assists the other, he said that the painter was competing with photography in its exactness. In the work of an artist under the influence of photography, the absence of colour and a tendency to muddiness were noticeable. Speaking of the more direct use of photography by artists, he said that a landscape or figures from nature reproduced by mechanical means gave him a sensation of repulsion—the same feeling, in fact, as if he had detected a forgery. Comparing machine work with hand work, he said people valued the latter because of the individuality of the producer. The photographer sought for the artistic element. This was advisable and legitimate, but, speaking of the exhibits at the Photographic Salon, which he said he had studied, he considered that many who exhibited there had tried to graft other charms on their work. Attempts were made to imitate artists' sketches, and by emphasising some parts of a photograph, leaving out others, and printing on rough papers, a sort of smudginess was obtained, and the chief merit of photography was attempted to be done away with. These things left a painful and unpleasant feeling on the mind. It was like a man putting on a coat that was not intended for him, and saying it was a misfit.

Mr. Webber remarked that he had never looked upon pictures with half the interest that he had since he had undertaken photography.

Rev. F. C. Lambert said that the difference between photography and painting was that they had qualities out of the reach of each other. Referring to Count Gloeden's nude studies, he said he was disappointed with them, as they did not look like flesh. He was surprised at Mr. Yeames praising them. They seemed to him to look like under-exposed pictures obtained by artificial light. Through the influence of photography, skies, clouds, water, breaking waves, &c., were now represented in painter's work with greater accuracy than twenty-five years ago.

Mr. E. J. Humphery was of opinion that the influence of photography on painting was to make the latter more truthful in its rendering, while painting was teaching photographers to make their photographs as unlike nature as possible.

Mr. George Davison remarked upon the novelty of hearing a prominent painter speak with such fairness about the relation of photography to painting as Mr. Yeames had done. Unlike many others, Mr. Yeames had taken the trouble to inform himself on his subject, and he (Mr Davison) was glad that he had got his information from the Salon. The effect of that and similar exhibitions would be seen as time went on. As to Mr. Yeames's contention that painters had a monopoly of emotion and emotional feeling, Mr. Davison quoted Brett, Stone, and Frith as not showing those feelings more than some photographers. Certain painters put rendering of tones above colour. The effect of colour lent charm to painting, and a photographer claimed to be able to render in black and white feeling in landscape and character and expression of the face. Mr. Yeames had said that photography was mechanical, and done without effort and exhaustion, but the photographer thought out his subject and controlled his tones and values. There was very little difference between the painter and the photographer if the matter were driven down to the bottom; at any rate, it was only one of degree, and not of kind.

Mr. C. G. Murrell, Mr. Pringle, and Mr. Machell Smith (who took the chair on the President having to vacate it) having also spoken, Mr. Yeames replied, and complained that there was no expression of individuality in photographs.

Keeping Qualities of Plates and Films.

Mr. Andrew Pringle, in a *Note on the Keeping Qualities of Modern Dry Plates*, said that during his recent visit to the tropics he had taken a considerable number of dry plates, as to the properties of which he proposed to speak. Several of the makers had advised him to develop as soon after exposure as possible. As to the methods of repacking, he found that it made no difference whether paper was between the plates or not. Air, however, had a great deal to do with the degradation of plates, in proof of which he showed two plates that had been packed face

to face. The corner of one had been broken off, and the unprotected portion of the other plate was badly fogged. He had tested all the plates and films he took with him before starting. As to the plates of a very rapid brand he had developed some abroad and found them all right, but on his return the plates were foggy and spotty. He had tried every developer with them, and had succeeded best with metol and pyro. The maker said that the spots must have been in the plates when he (Mr. Pringle) bought them. Another brand of plates that usually gave plucky images had black spots and fogged edges. Some colour-correct films kept well and without fog, but on use were less sensitive than when he left home. The maker doubted the loss of sensitiveness. He also found that the plates would not correctly render tropical foliage, and the films gave halation in some instances very badly. If all this were true, it was a serious matter. Twelve years before, during a journey round the world, he had successfully developed plates nine months after exposure, and lost very few. He hoped some good results would arise from his experiences.

Mr. Fergusson also complained of having experienced a falling off in the speed of films. He suggested the measurement of the diminution of speed at certain intervals, so that allowance could be made for it in the exposure. His experience of the English films was that they were better than the American.

Mr. B. J. Edwards had kept films for three years, and had found them in good condition. It was remarkable that Mr. Pringle had experienced deterioration in plates and not in films. He thought the nature of celluloid had no effect in fogging. As to the loss of speed, he had found no difference in a moderate time. He had tested films kept for twelve months against the same emulsion on glass, and could not find any difference. He, however, was making experiments bearing on the point. He thought it better to have a film that got slower than to have one that went foggy all over. It was, in his opinion, fully possible to make a film as perfect as a glass plate. As to the difficulty of getting detail in tropical foliage, he thought it was chiefly owing to the altitude of the sun, and to the strong contrasts between the light and the shadows. In this country the light was more diffused. He exhibited negatives on films and plates, exposed at the same time, and developed at once; also others developed three months after exposure. There did not seem to be any difference in the results.

Mr. T. Bolas pointed out that celluloid was not a constant quantity. It varied very much, and other materials were used in its making. Some celluloid did damage the film and render it insensitive.

Mr. T. C. Hepworth suggested that possibly the halation in the film negatives was due to the presence of dust in the air. As to the rendering of tropical foliage, he remembered that in Messrs. Bourne & Shepherd's wet-collodion work it was much better represented than at present.

Mr. H. A. Lawrence said that the speed of plates differed from that obtained when measured, for, when the plates left the drying room, there was no water in the film, but it was very likely absorbed subsequently, and thus would lead to the deterioration of the film.

After other remarks Mr. Pringle replied, remarking that he had kept some of Mr. Edwards's films for more than twelve months.

At the evening meeting, Professor Roberts-Austin, by the aid of diagrams and lantern slides, gave a discourse on *The Measurement of High Temperatures by Photography*, the plan employed being to photograph a reflected ray of light given by a thermo-junction and a dead beat galvanometer with fixed and movable mirrors.

An interesting discussion followed.

Captain Abney having given a description of the uses of Mr. F. E. Ives' Photo-chromoscope, showed some experiments in the composition of light with the three primary colours projected on the screen, and afterwards permitted those present to observe the coloured pictures given by the three colour selected positives in the instrument.

The meeting concluded with the reading of a paper by Mr. A. Haddon, on *The Cause of the Fading of Silver Prints*. The author finds that about five per cent. of the silver originally in the paper is irremovable by fixation and washing, the quantity left being sufficient, under chlorination and treatment with potassium nitrite, to yield a vigorous print. To these and other interesting experiments bearing on the subject we shall have an opportunity of referring more fully on a future occasion.

The Conference resumed on Tuesday afternoon, when the President again took the chair. The attendance was not large, and gradually diminished as the proceedings wore on.

The Position of Artistic Photography.

Mr. George Davison read a paper on this subject. It was in the main a defence of the artistic attributes of photography as against incompetent art criticism in the newspaper press.

In the discussion that followed,

Mr. E. J. Humphery said that, as he was neither a newspaper critic nor an editor, he was somewhat disappointed with Mr. Davison's paper. He thought that he was going to have an opportunity of attacking fuzzygraphs. Characterising Mr. Davison's work as rough, Mr. Humphery proceeded to deprecate eccentricity in photography, and appealed to photographers to be natural. It was only by cultivating eccentricity that Whistler had achieved success.

Mr. Rowland Bryant thought that the present artistic position of photography was full of promise, but that there were certain tendencies among artistic photographers which were not hopeful. Years ago the introduction of combination printing and retouching seemed to recognise that photography wanted hand work, and latterly they had got several things in the way of hand work which were not art and not photography. Among these he instanced local development of platinum prints; the non-transfer carbon method, to which Mr. Maskell had recently referred; vignetting; the use of crayons, as practised by Mr. Craig Annan; water-colour washes on prints; and other forms of dodging. These things were getting us into the position of being neither photographers nor artists. The excessive use of hand work was certainly not a hopeful sign.

Rev. F. C. Lambert was also disappointed with Mr. Davison's paper, as he somewhat unexpectedly found himself in agreement with the author. He thought that photography and painting were in parallel lines, but separate channels, and would ever remain so, because they worked by two entirely separate methods. The difference was one of kind. In his opinion the people who tried to imitate painting were not the true friends of photography. It was the case of the ass in the lion's skin over again; but he, for one, was content to remain the "humble moke." He thought that photography in the future might stand higher than painting. He deprecated passing off photographs as sepia drawings, and agreed with Ruskin that the "best art was that which best produced the best qualities of its materials."

Mr. H. P. Robinson defended combination printing as being pure photography.

Mr. J. A. Sinclair thought artistic photography had a future before it, but regretted to see so much slovenly work about. He had seen a photograph in which he did not know which were the sheep and which the grass.

Mr. A. Maskell believed that photography had great capabilities which at present were rarely brought out. He did not care for "pure photography," and had sympathy with working on negatives and prints. The subject of "faking" might very well form food tor discussion, and in that respect he was in favour of liberty. They were aware of what professional photographers did, and the question was how far others were to go. Was it, for instance, legitimate to turn a photograph taken on a sunny day into a misty photograph? The point was, Where would they draw the line?

Mr. Davison, in the course of his reply, said that, as regards what had been called "slovenly" work, such effects were not obtained with less care, thought, and work than other kinds of photographs. As to what had been called "eccentricity" in photography, many people like diffused treatment, and he defended the eccentricity of many of the "Salon" frames on similar grounds. As to combination printing, &c., he also claimed absolute liberty for one to do as one liked. Adverting to Mr. Lambert's remarks, he said that, as photography and black and white work had the same aim, the difference could only be one of degree, and not of kind. He, unlike Mr. Lambert, did not think photography would ever get ahead of painting.

The President would call the combination of hand work with photography not photography, but "photo-faking," In proposing a vote of thanks to Mr. Davison, he remarked that they had been dancing round the paper without touching or hurting it. It remained for discussion at some future time.

Mr. A. Mallock having read a paper on *The Amount of Photographic Action Produced by Various Lengths of Exposure and Intensities of Light*, Mr. L. E. Clift concluded the Conference with some *Notes on Photography as Applied to Process Work*. In this he advocated the wet-plate process for reproduction purposes, saying that most of the articles in the papers recommending dry plates must be taken with great reserve. Some of the scientific gentlemen who wrote about the use of dry plates for process work were not experienced. He showed by comparative cost that wet plates were cheaper than dry for the purpose. He had tried every photo-mechanical dry plate in the market with every developer, and had not succeeded. The fault did not lie with the plate itself, but with the gelatine. He ridiculed the people who wrote about the difficulties of the wet-plate process, saying that he had not had a single bath go wrong for four years. The paper was chiefly devoted to a description of the wet-plate process for photo-mechanical purposes.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION CONVERSAZIONE.

We have on a previous occasion referred to this Association abstaining the present year from holding an exhibition which, hitherto, they have made a triennial fixture. We think they are wise, for the surplus left from previous shows has been, we are informed, in the main devoted to furnishing and fitting, for social and photographic purposes, a suite of rooms second to none in the country. This has been done without running into debt, and we believe we are correct in saying that the legitimate annual income leaves a very respectable credit margin, a state of affairs well worthy of imitation. The previous exhibitions have, as many of our readers are aware, been inaugurated by a conversazione of a very successful character. A similar gathering was held last Monday,

and the Association may be congratulated on the *éclat* with which it was carried out. The whole of the noble series of exhibition rooms in the Walker Art Gallery were thrown open, by the courtesy of the Lord Mayor, to the members of the Association and their invieed guests; and when it is borne in mind that the walls of these rooms are now adorned by the pictures of the Spring Exhibition, which include some of the most popular exhibits of last year's "Academy" collections of choice photographs by some of the best known men, with an unusually varied series of art products in various branches, the skill of the managers of the Association will be seen.

Thus far, the visitors were, in a sense, provided for by the city itself; but the entertainment provided included a much more extended programme. Early in the evening a concert, embracing vocal and instrumental music, was given, the performers being deservedly greeted with loud and appreciative applause. Though not printed upon the programme supplied to each guest, we are able to give the following names of the performers:—Madame Andersen, Miss G. Appleyard, Miss Garnett, and Miss Kirkby (violin); and Messrs. T. Barlow, Arnold J. Cleaver, and T. Garnett—an exceedingly strong list of professional and amateur talent.

Following the completion of the musical programme, and after a short interval, Mr. Paul Lange gave, for the first time in Liverpool, his lecture, "Norway Revisited," illustrated with lantern views. Mr. Lange is, to start with, a very able lecturer, his natural *bonhomie* aiding him in giving point to the humorous recountals of his experiences at various stages of his illustrated "Visit." There were close upon 150 slides in the set, and we are in no way exaggerating when we say that there was not a single bad slide in the whole number, while those possessing pictorial beauty and of a high order were too numerous to be particularised. From the valleys to the highest peaks—many thousand feet above the level of the sea—Mr. Lange's camera, guided by the artist's eye, had laid under tribute mountain torrents, quiet lakes, waterfalls, panoramas of hill and valley, quaint wooden homesteads (interior and exterior), and, indeed, a series of pictures as varied and beautiful as we ever remember to have seen placed upon the screen. Lantern-slide enthusiasts were highly pleased with a number of cloud pictures—sunset and sunrise—included in Mr. Lange's series, and their curiosity was whetted as to how, without the addition of any pigment or hand work, he obtained such magnificent and varied colours in a single slide. It was some time after ten o'clock before his lecture was over, probably nearer eleven before the close of a *conversazione*, brilliant and of varied attraction, came to an end and the guests, nearly a thousand in number, departed.

News and Notes.

PATENT OFFICE LIBRARY.—Number of readers during the week ending April 21, 1894, 2440.

MESSRS. FUERST BROTHERS have taken over the sole sale for Great Britain, the colonies, and the United States of America, of Lumière's extra-rapid dry plates and orthochromatic plates, and "Citos'" citrate of silver printing-out paper.

MESSRS. MARION & Co. are issuing a fifty-two-page catalogue containing a list of articles in their stock-taking clearance sale, which takes place from May 1 to May 10. Goods from all their departments are included at extremely low prices.

IN consequence of Mr. E. J. Wall's lecture on *Colour Photography* taking place at Cordwainers' Hall to-night (Friday, April 27), Mr. J. Cadett's paper on *Speed-testing*, which was fixed for the same evening at the Central Photographic Club, has been postponed.

MR. W. PARRY, of 8, Ogle-terrace, South Shields, writes: "I see, in your notice of the Newcastle Exhibition, you have me down as receiving a 'bronze' medal in the Instantaneous Class. This is not correct, as it was a '*silver*' I got. I shall be glad if you will kindly correct this in your next issue."

CARAMEL-SIENNA TISSUE BACKING.—Mr. J. Brown, of Walker-on-Tyne, has sent us samples of his caramel-sienna tissue backing, which is intended for use in preventing halation. The tissue is easily applied to, and stripped from, the backs of the plates, and will no doubt answer the purpose for which it is intended.

A MODEST little catalogue of eighteen pages, from Mr. S. B. Turney, of Union-street, Plymouth, schedules all the requirements of working photographers. We learn from it that Mr. Turney has fitted up a dark room, which he places at the free disposal of his customers for plate-changing, and also for developing, at a small charge.

ROYAL INSTITUTION.—On Thursday, May 3, Professor Dewar will deliver the first of a course of three lectures at the Royal Institution on *The Solid and Liquid States of Matter*. On Saturday, May 5, Captain Abney delivers the first of the Tyndall lectures on *Colour Vision*; and on Tuesday, May 1, Professor Judd begins a course of lectures on *Rubies: their Origin, Nature, and Metamorphoses*.

WE congratulate the European Blair Camera Company upon having adopted the standard screws of the Photographic Society of Great Britain, even up to that by which the camera is affixed to the stand. A sample of this screw has been sent to us. It is longer than many, for the reason that the longer shoulder enables one to use it with a small headed tripod without having to spread the legs abnormally.

THE LECTURES ON COLOUR PHOTOGRAPHY.—The Assistant Secretary of the Photographic Society of Great Britain writes: "May I remind your readers that the first of the two lectures on *Colour Photography*, announced in a previous issue, will be held this evening, the 27th inst., and the second on the following Monday. A very interesting series of specimens will be exhibited. The chair will be taken punctually at eight o'clock by Sir Henry Trueman Wood, M.A., President of the Photographic Society of Great Britain."

WE have to acknowledge receipt of catalogues of photographic apparatus from Messrs. George Houghton & Sons, and Messrs. Horne & Thornthwaite. Messrs. Houghton's price list has assumed the goodly proportions of 280 pages, from which it will prove difficult to discover anything useful to a photographer that does not find mention, including a series of engravings of tastefully arranged pictorial backgrounds, showing interior and exterior views. Of the other list, that by Messrs. Horne & Thornthwaite, very much the same may be said, their variety of cameras, lenses, and other appliances being considerable.

ACCIDENT TO A SHEFFIELD PHOTOGRAPHER.—A rather serious accident occurred on Saturday, March 31, in the afternoon, to Mr. W. Dakin, of Holly Bank, Nether Edge, Sheffield, photographer. Mr. Dakin is a Sergeant in the Yorkshire Dragoons Yeomanry, and was riding his horse along Green-lane, on his way to drill. The horse was startled by the hissing of a steam pipe, and shied; it stumbled, and fell on its side. Mr. Dakin, who fell underneath the horse, sustained a fracture of the leg. Dr. Curtis, who was passing at the time, finding the leg broken, advised Mr. Dakin to be taken to the infirmary, which was close by, where he was detained, and at the last report was progressing favourably.

PHOTOGRAPHY AND PERIODICALS.—George Newnes & Co. are publishing, month by month, in the pages of *The Picture Magazine*, examples of the most popular photographic productions of our leading workers. Each number will, we understand, contain five examples from the studio of a particular master. Thus the present issue includes five reproductions of Adam Siston's pictures with a camera—the *Deserter*, the *Fisherman's Home*, *Happy Days*, &c.—while the forthcoming will display selected specimens by Lyd Sawyer, following which Messrs. H. P. Robinson, Ralph Robinson, Alf. G. Tagliaferro, John H. Gear, and others will be duly represented. The above have been arranged for by Mr. Hector Maclean, who has also supplied brief notes descriptive of the pictures and their authors.

THE Committee of the South London Photographic Society have decided to offer a medal in October next for competition among the members of the Society for the best set of twelve lantern slides from negatives taken on the Society's excursions, accompanied by a written description, the reading of which must not occupy longer than eight to ten minutes. More than one set may be sent in. Entrance fee, 1s. each set of slides. At the sixth Annual Exhibition, to be held in November, 1894, one or more medals will be offered for competition in each of the following classes, open to members only:—Class A, Portraiture and Figure Study (including Animals); B, Architecture; C, Landscape (above half-plate); D, Landscape (half-plate and under); E, Enlargements; F, Lantern Slides); G, Excursion Pictures. In addition to the above, there will be open classes for medalled and unmedalled pictures and lantern slides, as at the last Exhibition.

BATH PHOTOGRAPHIC SOCIETY.—The first Annual Dinner of this Society took place at Fortt's on Tuesday, April 10, and was very successful. Mr. Austin J. King presided, and Mr. Perren occupied the vice-chair. After dinner a short toast list was gone through. The Chairman, in proposing the usual loyal toast, "Her Majesty the Queen," spoke of the deep interest several members of the Royal Family take in photographic pursuits. The Very Rev. Monsignor Williams proposed "The Bath Photographic Society." He had watched with keen pleasure the rise and progress of the Society, and it was not lacking that day any of the energy displayed at the start. The officers were faithful to their work. The numbers and finances were satisfactory, there was an absence of friction, and he wished the Society a long life of prosperity. Mr. Middleton Ashman, the Hon. Secretary, in acknowledging the toast, said they had diligently pursued the path indicated by the founders. The general good humour he attributed to there being a goodly proportion of lady members. The combination of amateur and professional was another element favourable to a good understanding. He hoped the present interest would be sustained, that each would demonstrate some practical process and so keep well up to date. Mr. G. F. Powell proposed "The Visitors," and remarked that Mr. Cogan had probably the longest experience of any living photographer. Mr. J. D. Cogan, responding to the toast, said he was engaged commercially in photography fifty-five years ago, and at that time prepared photogenic paper for the shops. He was well acquainted with Fox Talbot, and had crossed swords with him in respect of certain patents. Mr. Thomas F. Plowman, also responding, gave amusing reminiscences of his early photographic experiences with the collodion process. The Chairman proposed "The President," and, after paying a compliment to that gentleman's ability, referred to the advantage accruing alike to professional and amateur by the present arrangement. The recreative amusement afforded the latter whetted the appetite for new apparatus, new styles of work, and experiment. It also indicated the need of certain work, and this made business for the former. The same rule applied to law and medicine. Amateurs and professionals were alike essential to the well-being of photography. Mr. Perren, in responding, remarked on the pleasure it gave him to work for the Society, and he felt keenly the honour done him and his professional brethren. The toast of "Kindred Societies" was, in a genial speech, given by Mr. Britten, and ably responded to by Dr. Norman. "The Chairman" and "The Dinner Committee" were also toasts duly honoured. The proceedings were enlivened by vocal and instrumental music, to which the President, Mr. New, Mr. Plowman, Mr. Lambert, Mr. Fortt, Mr. Swain, Mr. Shackell, and Monsignor Williams ably contributed.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7495.—"Improvements in and connected with Cameras." A. E. Muirhead.—*Dated April*, 1894.

No. 7755.—"Developing Dish." E. Holden.—*Dated April*, 1894.

No. 7780.—"Improvements in Photographic Cameras." M. E. Dunscombe.—*Dated April*, 1894.

No. 7830.—"Improvements in and connected with Cameras." M. Ballantine.—*Dated April*, 1894.

No. 7928.—"Improvements in means or Apparatus for Separating and Manipulating Glass Plates or Flexible Films in Photographic Cameras or Changing Boxes for same." W. Cuthbertson.—*Dated April*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
30	Camera Club	Description of the Photo-Autocopyist. J. Taylor.
30	Midlothian	Exhibition of Members' Work and Smoking Concert.
30	Richmond	
May.		
1	Birmingham Photo. Society	
1	Bolton Photo. Society	
1	Brixton and Clapham	Discussion on Hand Cameras.—Demonstration on Intensification of Negatives and Lantern-slide Making.
1	Exeter	
1	Hackney	Annual Meeting.
1	Herefordshire	
1	Lewes	
1	North London	
1	Oxford Photo. Society	
1	Paisley	
1	Rotherham	
1	Sheffield Photo. Society	Practical Enlarging, with Society's New Apparatus, on Platino-bromide Paper. The President.
1	West London	
1	York	
2	Edinburgh Photo. Society	
2	Leytonstone	
2	Photographic Club	
2	Southport	
2	Southsea	
3	Birmingham Photo. Society	
3	Camera Club	*Chicago Exposition.* H. Noel-Cox.
3	Dundee and East of Scotland	
3	Glasgow Photo. Association	
3	Glossop Dale	
3	Hull	
3	Leeds Photo. Society	*Development.* S. A. Warburton.
3	London and Provincial	*Cheap Plate-making.* J. Truscott.
3	Oldham	
3	Sheffield Photo. Society	Excursion: Bolton Abbey.
3	Tunbridge Wells	
4	Brighton and Sussex	
4	Cardiff	
4	Central Photographic Club	
4	Croydon Microscopical	
4	Holborn	
4	Leamington	
4	Maidstone	
4	North Kent	
5	Hackney	Exc.: River Roding. Leader, A. Dean.
5	Hull	
5	South London	Exc.: River Roding. Ldr., H. E. Farmer.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

April 24,—Technical Meeting,—Sir H. Trueman Wood (President), in the chair. Comparative photographs were passed round, taken by Mr. Dibdin, with and without polarising apparatus. The results, which were strictly comparative, each pair being developed together, showed that clouds, reflections from leaves, &c., were rendered very much better with than without the polariser.

Photogravure.

Mr. Wilmer proceeded to demonstrate his method of working the photogravure process. He dealt with, first, the class of negative and transparency most suitable. Many amateurs, he said, failed because of their negatives not being first class in quality. A trial resist should be developed on opal; he used tissue specially prepared for the process. The graining box should be large enough, or the grain was unequal. With a small box a plate would probably require more than one graining. A frequent cause of failure lay in an insufficient heating to fix the grain. When bitumen was employed, overheating was not at all likely to occur. A quantity of etching solution should be prepared; he generally dissolved up seven pounds of chloride of iron at a time. He then proceeded to grain and etch a plate, and to clean off the film. The resulting plate was passed round, as were plates and proofs by Messrs. Waterlow, as well as some by himself.

Mr. Bolas remarked that Fox Talbot had devoted a great portion of the last years of his life to working out the principles of the etching process. The Talbot process yielded results fully equal to the finest photogravure work of the present day, was quicker, but its uncertainty was its great drawback.

Mr. Macintosh had had some difficulty in getting clear whites round a vignette, and asked how it could be done.

Mr. Geddes said that the plates passed round of Messrs. Waterlow's make were in many cases produced by the same process as shown by Mr. Wilmer. Some, however, were prepared by Guilleaume's process, in which the plate was coated with bichromated gelatine, then grained, a transparency registered down upon it, the plate etched, then resensitised, grained and etched, the process being repeated three times, the transparency being registered carefully each time. Differences of temperature, by causing the plate to expand, rendered registration difficult, but for large numbers—say, thousands—of pulls these plates were preferable.

Mr. Debenham said a point to be noted in connexion with photogravure is that the deep shadows may be emphasised by special biting, so as to separate them from the next half tones. In pure photographic processes on matt-surface paper the deep shadows occur together in a way that they do not do on glossy surfaces. This has been, to his mind, a serious defect in matt-surface photographic processes, and it is well to note that in processes such as photogravure there is a power such as the draughtsman and engraver possess, of emphasising the deepest shadows, so as to remove the dinginess of the deep half-tones common on matt-surface prints by a purely photographic process.

Mr. Pringle said he had been supplied with a graining box, the top edges of which were chamfered off, and in consequence it never grained evenly. He found that he nearly always had to grain a plate more than once, generally three times. He had been much troubled with what were known to etchers as "devils," and should like to know their cause.

The President said that some years ago he had worked at the process and he would tell the members not to go away with the impression that it was as easy as it looked.

Mr. Wilmer had been troubled with "devils." Mr. Ernest Edwards had told him he had never met with them on an ungrained plate, while his chief etcher attributed them to the etching solution being acid.

Mr. Lawrance said there were two kinds of "devils," but could not say to what they were due.

Mr. Geddes remarked that he had heard them attributed to pores in the copper. He thought the only way to make a successful vignette was to burnish the white margin.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 19,—Mr. J. Traill Taylor in the chair.

Mr. E. P. Adams was elected a member.

Estimation of Silver in Dry Plates.

Mr. A. Haddon read a paper on this subject, prepared by Mr. F. B. Grundy and himself [see page 262].

The Chairman observed that the labour involved in the experiments described could not be estimated by the length of the paper. Alluding to the fact that density did not altogether depend on the quantity of silver on a plate, he said that Mr. Herbert S. Starnes, at a meeting of the Association, once passed round a number of plates which gave singularly great density, and in which the quantity of silver present was less than anything shown in the tables of Messrs. Grundy and Haddon's paper.

Mr. Haddon said that the quantity of silver was half a grain to a half-plate, it being estimated by the amount of nitrate of silver used in the emulsion.

Mr. T. Bolas asked if Mr. Grundy and Mr. Haddon had made any experiments to determine the maximum possible opacity with the quantity of silver in a plate?

Mr. Grundy said it had been considered, but the experiments would take too long. Development would have to be conducted under standard conditions.

Mr. Haddon, referring to the table of results, said that the Woolwich plate looked an exceedingly thin one, and he was much astonished to find the amount of silver it contained. It was a very rapid plate, with a very coarse grain. One could not always judge the amount of silver in a plate by the visual opacity.

Replying to questions, Mr. Grundy said that, in the determinations, no part of the solutions were thrown away, so that allowance was thus made for the slight solubility of silver bromide in potassium bromide. The silver salts never left the beaker in which they were first placed.

Mr. P. Everitt said Mr. Haddon had stated that it was not the quantity of silver on the plate which ensured the best results, but the skill of the user; we must, however, also recollect that it is not every person who uses dry plates who *is* a skilful man. He thought they ought to have some latitude of exposure with plates, and that would depend very much upon the amount of emulsion on them. The thicker the coating the more latitude of exposure there would be. He would prefer a thickly coated plate to a thinner one. Referring to the table, he said the Sandell plate appeared to have the highest amount of silver; he was glad to see it reduced to ordinary price. As to the mean quantity of silver on a quarter-plate being, according to the results, from a grain to a grain and a quarter, he quoted a formula of Captain Abney's which worked out at two grains of silver to the quarter-plate, and, speaking as an amateur not very skilled in the use of plates, he would prefer a plate with two grains of silver to the quarter-plate to some of those low down on the list. He passed round a plate made in 1885, which appeared to him to contain more silver than usually met with on an ordinary plate. He thought that they should look to the plate-makers to give them more emulsion, as, considering the amount of halation obtained with ordinary plates, the emulsion was not sufficient.

Mr. Haddon said that in the majority of slow plates the emulsion was of a different colour than the rapid. Answering Mr. Cobb, who alluded to sensi-

liveness being coupled with transparency, Mr. Haddon said that increase in the size of the grain determined the degree of transparency.

Mr. EVERITT asked if an ammonia-prepared plate gave more density than a boiled plate?

Mr. W. COBB would expect the reverse to be the case.

Mr. J. CADETT said that some years ago, in conjunction with an analyst, he had analysed the plates then to be bought, and the results obtained were comparable to the results got by Messrs. Grundy and Haddon. He could quite appreciate the labour involved, and he (Mr. Cadett) thought they all owed hearty thanks to those gentlemen. Continuing, he said they all knew by experience that density was not by any means a matter of thickness of coating; it was simply a characteristic of the plate. Ratio between the densities was another point, and this depended on some intrinsic property of the plate and the developer; Mr. Everitt had grumbled at the small quantity of silver on plates generally; but plate-makers had to consider the complaints of photographers with regard to time of fixing. The photographer liked a plate that would develop quickly and fix quickly. With regard to the amount of silver in a plate, the range of the printing surface had to be considered. This could be taken as 1 : 30, but he would undertake, on a thickly coated plate, to get a range of 1 : 100, so that they had considerable latitude. Taking negatives out of doors, an even greater range was obtained, and there was no printing paper in the world that could possibly give that range. Probably ninety-nine per cent. of the plates made were used in the studio, where the light is under sufficient control, and a thinly coated plate is really of more use to the average photographer than a thick one. Of course, in landscape work a heavier coating was necessary. Alluding to the fact that the rapid plates of one maker contained less silver than the ordinary, he said it must not be supposed that the silver used for the rapid plate was less than for the ordinary, as in making rapid plates by some formulæ a very considerable quantity of the silver went down during the manufacture. He thought it better to go by results than to question the amount of silver present in a plate. The paper would have been more interesting if the authors could have given them the precise proportions of bromide to iodide, &c.

Mr. A. J. BROWN doubted if, as Mr. Cadett had said, ninety-nine per cent. of the plates made were used in the studio.

Mr. JOHN HOWSON would put the figures as between eighty and eighty-five per cent.

Mr. EVERITT suggested that plate-makers should strive in the direction of reducing the quantity of gelatine present. He also pointed out that, at the present price, the amount of metallic silver present in a dozen quarter-plates was under a pennyworth.

Mr. CADETT humorously remarked that plate-makers were only just now beginning to live. As regards the cost of manufacture, he said that only the previous week he had had to clean off 1200*l.* worth of plates, as he did not consider them good enough to send out.

A vote of thanks to Mr. Grundy and Mr. Haddon concluded the proceedings.

PHOTOGRAPHIC CLUB.

APRIL 18,—Mr. R. P. Drage in the chair.

Mr. F. A. BRIDGE asked if it were possible, in looking at a stereoscopic picture in the stereoscope, to tell if it had been taken by a pair of single lenses or a pair of doublets.

Mr. E. CLIFTON thought it depended on the focus of the lenses in the stereoscope.

Mr. A. COWAN was of opinion that, in landscape pictures, the difference could not be seen.

Mr. J. NESBIT said that single lenses gave greater crispness than doublets, but, if one picture was to be used for lantern-slide making, doublets must be used, especially for interiors or architecture.

Mr. E. W. FOXLEE said that, although doublets were used for architecture, distortion would result in the stereoscope.

PLATE-CHANGING APPLIANCES.

Mr. J. A. SINCLAIR exhibited Messrs. Adams' changing box for holding twelve plates or twenty-four films. It had the same gauge in front as an ordinary slide, and the same focussing screen was used. The plates are received into a leather bag. Thick or thin plates are equally in register; after exposure, the front plate was lifted and placed at the back.

The CHAIRMAN had, on his recent travels, exposed hundreds of films in a changing box, which had only stuck once, through a bent carrier.

Mr. J. WEIR BROWN described a changing box in which a dark slide was inserted and the plates removed. It held twelve plates, and worked very satisfactorily.

Mr. CLIFTON preferred dark slides, even for hand cameras.

Mr. CHILD BAYLEY had changed plates successfully by using an ordinary wet-plate slide inserted in a bag, which was tied round his wrist.

Mr. BRIDGE said that, when using Hare's changing box, he had never been troubled with dust, the grooves being made of pear wood, which was extremely hard.

The CHAIRMAN, in concluding the discussion, said he thought a changing box the best thing for a hand camera. It was certainly a great advantage over a dark slide.

Brixton and Clapham Camera Club.—April 17.—A lecture, illustrated by slides, was given by Mr. J. BARTROP, entitled *A Cruise on the Norfolk Broads.* Members' slides having been passed through the lantern, a demonstration was given by Mr. W. Thomas, showing, for the benefit of some of the members, the effect of under and over-exposure. Three ordinary plates, having been exposed respectively three, nine, and twenty-seven seconds to gaslight behind a transparency, were developed with a normal developer, and the resulting negatives were then passed round for inspection.

Central Photographic Club.—April 20.—The evening was devoted to a lantern lecture on *India* by Mr. J. L. Lyell. The lecturer, who had spent twenty years in the Indian peninsula, first introduced his audience to Bombay, which could not within living memory be reached in less than six months. He showed views of Watson's Hotel, Elphinstone College, Muir University, and the Clock Tower. Delhi was introduced by a photograph of the Gate of the Citadel. The white marble palaces and monuments of that town each received its share of attention. The King's Private Audience Hall, in which was formerly the noted "Peacock Throne," was also illustrated. Agra, the Dargh, Futtypore, Secra, and Secundra were then described. The lecturer mentioned that the Government take care of the most notable buildings in India, and measured sections and photographs are published, which would enable any one who was so disposed to erect a duplicate of them. The buildings in Lucknow differed from those in the towns already described, the white marble and hard sandstone of the latter being supplanted by stuccoed stonework. The gate and the ruins of the Residency, with the marks of shot and shell, recalled memories of the siege in the hot days of 1857, as also did the Landing-place and the Well of Cawnpore, with the monuments erected over it. Benares received a considerable share of attention, and also the great fairs helds on the banks of the Sacred Rivers, the crowds attending them, the fakirs, and the religious mendicants. The place where the bodies of the Hindoos are cremated was also shown. Mirzapore, Allahabad, and other places were illustrated and described.

Croydon Camera Club.—April 18.—Messrs. G. W. Watson and E. A. Addis Woodcock were elected members. Results of the Carshalton excursion were shown by Messrs. Smith, Maclean, Noakes, and Corden, the latter of whose enlargements upon bromide paper being specially attractive, as were some football scenes by the same. The PRESIDENT then gave an address upon *Correct Exposure*, in which all the chief elements affecting the duration of exposure were passed in review. Respecting speed of plate, slow, medium, and fast, are three rough grades; speed numbers are often misleading. The best test is individual experiment with a plate in the field. Referring to developers, he stated that, by employing one which he was testing, it is claimed that certain plates could be given one-fifth of the present minimum exposure. Actinometers, used to judge duration of exposure, as at present made, were disapproved of, for reasons stated at length. The colour of subject was dwelt on, and the difference in time between a red house and a blue barge referred to. In connexion with this, he stated that pure red would need an exposure of 200 times as much as pure indigo, in order that equivalent chemical action ensued. The enormous extremes of exposure under widely different circumstances were illustrated. Thus Professor Vernon Boys has taken a photograph in one ten-millionth part of a second! On the other hand, Howard Farmer, the Principal of the Polytechnic School of Photography, has calculated that, to enlarge by means of photography, a miniature up to twenty-four feet by eighteen feet at *f*-120, in ordinary room with *instantaneous* isochromatic plate and a yellow screen, the time of exposure would be 100 *years*. In conclusion, the best-known exposure meters and tables were briefly described, while special attention was given to the newly invented "Optimus Exposure Indicator." This Mr. Maclean considered amongst the best of the aids to memory and judgment which the photographer could use. By referring to the little instrument, which can be carried in a purse or pocket-book, the approximately correct exposure for fifteen typical kinds of subjects may be seen at a glance, a sliding scale enabling the user, without mental arithmetic, to vary the stop of the lens employed between *f*-4 and *f*-126. The discussion was taken part in by Messrs. W. H. Harrison, S. Wratten, J. Smith, H. E. Holland, E. Pierce, J. Burn, and others. Mr. SMITH proposed that "A Section for Lady Photographers be organized." This was supported by Messrs. Frost, Lock, Brown, and others. The first idea is that the section shall be entirely managed by the lady members, whose ordinary meetings will be independent of the present Club meetings, joint meetings to be held by special arrangement of the Secretaries. The subscription to be 10*s.* 6*d.* per annum, half of which would be paid to the general fund, and the balance used by the ladies' section for printing, postage, &c., the section to have free access to the rooms for ordinary photographic purposes. Mr. H. E. Holland, Assistant Honorary Secretary, 69, Lansdowne-road, will be glad to hear of lady photographers who approve the above scheme.

Ealing Photographic Society.—April 19, Mr. H. W. Peal in the chair.—Subject, Arrangement of Summer Outings. Six meetings were arranged, each of which will be under the charge of a member, who will make all the necessary arrangements. The first meeting will be held on Saturday, April 28, at the Lock House, Boston-road, Hanwell, at three p.m., Mr. A. F. Taylor being the leader.

Fulham Society of Literature, Science, and Art.—April 12.—Mr. E. A. Leblanc gave a practical demonstration to an appreciative audience on the new developers invented by Dr. Andresen, and made by the Berlin Manufacturing Company. He explained fully the convenience of having them supplied in the cartridge form, the contents having to be simply dissolved in water and being immediately ready for use, and the great advantage of not staining the hands or clothes. Different forms of cartridges were used by the demonstrator, both for the developing and the fixing of the negative. The cartridge containing the combined toning and fixing bath for prints gave some beautiful tones, which were highly approved by the audience.

Hackney Photographic Society.—April 16, Mr. W. A. Hensler in the chair.—Work was shown by the following: Prints by Mr. Dean, lantern slides by Messrs. Houghton, Carpenter, Wilks, and Guest. An interesting set of slides, lent by the proprietors of *Tit-Bits*, &c., illustrating *How Popular Periodicals are Produced*, was shown on the screen. Mr. E. Puttock read the lecture which accompanied the slides.

Leytonstone Camera Club.—April 11, Mr. A. E. Bailey in the chair.—Mr. F. W. WATES gave a demonstration on *Flashlight Photography*. He began by most lucidly explaining the various points to be considered to ensure successful work. Several members having brought up cameras, some exposures were made, and finally the whole of the company were taken in a group, the results in several cases being excellent.

North Middlesex Photographic Society.—The fourth Instruction Evening of the present series was held on Monday, April 16, Mr. C. Beadle in the chair.—Mr. A. J. GOLDING read a paper on *Selection of Subject*. Mr. F. W. COX favoured the education of the eye in place of using ruled lines on the screen, and said that going to one subject was to become a faddist. Mr. S. E. WALL advocated the use of wide-angle lenses in interior work. Mr. J. MCINTOSH suggested that young beginners, for whom the paper was written, should work with a motive—something more than just photographing landscapes just because they were pretty things—and make each photograph tell its tale. Mr. F. L. PITHER thought that the lines on the screen were useful to young beginners, as it prevented them from making glaring mistakes, but, otherwise, did not like the idea of any photographer or artist being tied down to any set rules of composition.

Putney Photographic Society.—The President, Baron Pollock. and Lady Pollock, held a reception, and entertained the members of this Society and their friends at their house on Tuesday, the 17th inst., on the occasion of the Society's first Exhibition of members' work. There was a large attendance of ladies as well as gentlemen, all of whom apparently fully appreciated the efforts made for their enjoyment, which, in addition to the Exhibition prints, included a display of members' lantern slides, as well as some kindly lent by leading workers of neighbouring societies. Among the photographs on view, there were a number of well-known pictures by Colonel Gale, Messrs. Hodges, Hollyer, Karl Greger, and the Autotype and Eastman Companies, and others. It is needless to say that these charming examples of photographic work were greatly admired by every one. The greater number exhibited by the members were entered for competition, two notable exceptions being Mr. Walter L. Colls, who, through a misunderstanding, sent in too late, and Dr. F. J. Farrar, whose work consisted of admirably executed copies of portraits and other oil paintings, which were, however, excluded by the rules. The competition pictures were divided into two classes, those above half-plate being in one, and those of that size and under in the other. Colonel Gale kindly officiated as Judge, and made his awards as follows :—Silver medal, for the best picture in the competition, to Mr. G. E. Martin, for his enlargement on platino-bromide paper, *On Cheltenham Beach, Auckland, N.Z.;* bronze medal, to Mr. W. Martin, jun., for *Not to be Coaxed;* and certificate to Dr. W. J. Sheppard for *Godalming*. In the class for smaller pictures, the bronze medal was awarded to Mr. W. F. Gorin for *A Stormy Sunset*, and the certificate to Mr. L. S. Zachariasen for *Hoiteseidvand*. Colonel Gale said that he considered the general average of the exhibits a very creditable one.

ON Thursday, April 19, an ordinary meeting of members was held at the Society's rooms, Dr. W. J. Sheppard in the chair. Mr. Arthur Smith was elected a member. Hearty votes of thanks were passed to Baron and Lady Pollock for their kind hospitality in connexion with the late Exhibition, to Colonel Gale for judging, to the gentlemen and firms who had kindly lent pictures and lantern slides, to Mr. Overy for lending and ably working the lantern, as well as to the members of the Exhibition and Hanging Committees. Messrs. BRAHAM and BURTON, of the Autotype Company, gave a demonstration of the *Carbon Process*. A large muster of members were present, who followed the operations and Mr. Braham's clear and concise explanations with sustained interest throughout. The advantages of the process were made manifest by the extreme simplicity of the manipulation, chemicals, and apparatus, as well as by the great beauty and variety of the specimen prints which were shown.

South London Photographic Society.—April 16, Adjourned Annual Meeting at Hanover Hall, Hanover Park, Peckham, Dr. T. C. Munyard in the chair.—A long discussion took place on the recommendation of the Committee to increase the subscription to 7*s.* 6*d.*, when it was ultimately resolved that it should remain as at present, viz., 5*s.* Mr. Mark Boxall, of 8, Danby-street, Peckham, was elected Hon. Treasurer, and Mr. E. Homewood was appointed to fill Mr. Boxall's place on the Committee.

Bath Photographic Society.—A meeting took place at the Royal Literary and Scientific Institution on Monday, April 16, Mr. Augustus F. Perrin (President) in the chair.—Mr. J. D. Cogan, Mr. A. Bartlett, and Mr. C. Foot were elected members of the Society. Mr. BIRT ACRES then gave a demonstration of *Carbon Printing*. He said it was more than thirty years since Swan took out his patent for carbon or pigment tissues, but, partly through being hampered, it had not succeeded in establishing itself in popular favour to the extent that its undoubted permanency would appear to warrant. Besides being permanent, any colour, and almost any effect, was possible by judicious modification. One of the important points about the development of a carbon print is, that it is not a subtle chemical process, but is a purely mechanical one, viz., the dissolving away in warm water of the parts of the pigmented tissue *not* acted upon by light. Briefly described, an emulsion of gelatine and some finely ground pigment is evenly spread on paper; this is sensitised with a bichromate salt, which renders gelatine insoluble, the action being greatly assisted by white light. When dry, it is ready for printing in the same way as other processes. The lecturer, having gone minutely into the details, proceeded to show, step by step, the various stages in producing some very charming carbon prints on opal paper. He also developed some carbon pictures on a new etching paper, which was greatly admired, and he showed what a range of power was available for altering locally, or the whole, of the vigour of any particular subject under treatment. The lecturer was followed with the greatest interest, and at the close the Chairman thanked Mr. Acres most cordially for the trouble he had taken to come from London in order to deliver this lecture.

Sunderland Photographic Association.—On the evening of the 18th inst., the usual monthly meeting of this Association was held at the Café Mr. Millburn (President) in the chair.—After the ordinary business, Mr. W. Parry, of South Shields, one of the Vice-Presidents of the Northern Counties' Photographic Association, read a paper on *Instantaneous Photography*. In the course of his remarks, Mr. PARRY traced the history of rapid exposures, from the earliest days of photography to the present day, showing many slides illustrating very rapid work, including several of cruisers and ironclads at sea steaming at full speed, for which class of work Mr. Parry is so justly famous. A hearty vote of thanks was voted to the lecturer. The results of the Association's competitions for enlargements and hand-camera work were announced, the silver medal for the former being awarded to Professor Brady, and in the latter to Mr. J. Pratt, a bronze medal in this class being awarded to Mr. Broderick.

FORTHCOMING EXHIBITIONS.

1894.		
April 27, 28.....	*Newcastle-on-Tyne International.	Hon. Secretaries, Art Gallery, Grainger-street, Newcastle-on-Tyne.
„ 27, 28.....	*New York.	T. J. Burton, 111–115, West Thirty-eighth-street, New York.

* Signifies that there are open classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTO-MECHANICAL NOTES.

To the EDITOR.

SIR,—As a wet-plate operator, wholly engaged in the making of half-tone negatives, may I be allowed to offer a few remarks upon your contributor's (Mr. Gamble's) notes of April 13?

I hope that Mr. Whiting's letter last week has already sufficiently disposed of the unwarranted slur upon the operators in our branch of work. As if, in the nature of things, wet-plate operators were the dregs of the profession, and that the handling of a dry plate would necessarily and immediately change a (careless) man's character. Certainly I should consider the operator justified in protesting against using a "mirror as full of holes as a sieve." To use such apparatus requires either an operator as careful (?) as your contributor himself, or one so careless as to be blind to the state of his tools. Fortunately, such extreme types are rare. For the sake of argument I am willing to admit that, possibly, an amount of carelessness on the part of the operator, which would be fatal to a wet-plate negative, may be disregarded in the case of a gelatine one; but, if this is what Mr. Gamble means, why, in the name of common honesty, doesn't he say so, instead of abusing a body of men whom, it is notorious, are frequently sought for by process firms in vain.

As my existence depends upon this work, of course I am anxious to welcome any true advance; but, lest any one should be misled by Mr. Gamble's slipshod reasoning and contradictory contentions, let us examine his article. Notice, firstly, that he himself has a great deal to say *against* the adoption of the gelatine dry plate, *e.g.*, 1. "Certainly no plate yet introduced has fully realised the proper requirements." (It is hardly necessary to observe that a wet plate does so, thoroughly.) 2. "There can be no doubt that when things go smoothly, collodion is cheapest," and then in order to justify the entailing of extra expense for dry plates he asserts that things do not as a rule go smoothly. No one denies that difficulties sometimes occur, but would they vanish with the advent of the dry plate? From his own experience, he previously observes that "requiring the use of dry plates by other people was a disheartening waste of time and money." And yet it is so very simple! 3. The expense of overhauling and altering plant at present in use. According to Mr. Gamble there would be no gain in time, but as a practical man I say there would be a distinct *loss*, and must entirely endorse Mr. Whiting's scornful contempt of the comparison given. Now, in the final paragraph we come to the emphatic assertion that "there can be no doubt that it is a decided advantage to use dry plates for half-tone work especially." And why? Well, here at last we come to the *only* reasons in favour given in the whole of the article, and that in the characteristically confident style, unsupported by any evidence, to which we are becoming so accustomed, thus, "besides getting uniformity and perfect cleanliness, the well-known spreading action of the gelatine plates helps the process of hatching the grain."

Now I say that it is not difficult to maintain uniformity in wet-plate negatives; and as to cleanliness, surely no one in his senses would venture to assert that cleaner negatives can be obtained on dry plates than on wet plates, by *any* means, much less easily obtained.

Finally, Mr. Gamble concludes by, vulgarly speaking, "giving himself away," for he proceeds to indicate some satisfaction at the "best blocks now turned out in which the dots in the negative spread themselves in the high lights." Yes, exactly; but do the firms which produce these beautiful results use dry plates in order to take advantage of the "spreading action of the gelatine?" No, of course they don't; and I

should certainly be glad to see the block produced by means of a gelatine plate in any way fit to compare with them.

I have thus far trespassed upon your space because I believe that the logic of a *business* argument, at least, should be beyond reproach.—I am, yours, &c.,

A. J. Newton.

April 23, 1894.

To the Editor.

Sir,—I am very glad to see Mr. Whiting taking up cudgels on behalf of wet-plate photographers against the somewhat sweeping condemnation of Mr. William Gamble in his *Photo-mechanical Notes* in your issue of April 13.

Mr. Gamble appears to have fallen into the very common error of taking a few of the worst examples of workers, and holding them up as representatives of their craft. This is not fair.

That there are some "dirty, slipshod, and unmethodical" wet-plate workers is quite true. The same may be said of some dry-plate workers.

Men who are clean and methodical by nature or training will be so in whatever work they are engaged. As for the "old hands" making excuses for bad work, I very much question whether they are more prone to do so than the young ones—and it is certainly only very bad workmen that always blame their tools.—I am, yours, &c.,

Charles W. Gamble.

P.S.—I should not have entered into this discussion had not Mr. William Gamble's opinions been attributed by some people to myself.

Photographic Department, People's Palace, E., April 23.

UNEVEN TONES.

To the Editor.

Sir,—Seeing in almost every issue of your Journal complaints about unevenness in the tones obtained on gelatino-chloride paper, kindly allow me to state my experience. I have used Ilford P.O.P. over twelve months, and at first was troubled with unevenness in tone, especially with the remainder of the batch. Learning that thorough washing previous to toning was necessary, and happening to have convenient a camel's-hair brush—which must be of the finest quality, so as not to scratch the prints—I used same. I should also mention that when new it should be well rubbed on a piece of burnt bone; this will rid it of grit. A brush of this class can be purchased for sixpence. With this brush, after the first washing, I went over each print thoroughly, and am happy to say that I was afterwards not only never troubled with unevenness in tone of the same print, but had uniformity in the whole batch, and a pint of toning bath will tone half as many more prints without failing. Trusting this may prove useful to some of your readers.—I am, yours, &c.,

H. O'Donnell.

April 14, 1894.

THE SIZES OF CELLULOID FILMS.

To the Editor.

Sir,—Can you give me the reason why celluloid films should not be cut accurately to size by the makers?

I have films of three makers, all purchased recently, quarter-plate size varying one-sixteenth of an inch, and whole-plate one-eighth of an inch. Not only this, some are not even square. I can buy 1000 mounts, or lantern masks, varying hardly a hair's breadth. Why not films? Surely there is now a sufficient demand for the makers to have accurate dies to cut them.

It is bad enough for the films not to fit the ordinary carriers, but there are now hand-cameras taking films without sheaths, but they cannot work properly with films out of size and out of square.—I am, yours, &c.,

H. G. M. Conybeare.

THE USES OF THE NICOL PRISM.

To the Editor.

Sir,—Being accustomed to write as precisely as possible, I wrote the letter published in your last. I thought that, in the debate on Mr. Birt Acres' paper, I had cleared up the points referred to in your editorial note.

Suppose that any one were to take out a patent for an improvement in lenses, cameras, plates, &c., might I ask your permission to assure those of your readers who desired to employ a lens, camera, &c., "that they will not incur the slightest risk" in using either of those well-known systems so many thousands of times referred to in the public prints? Similarly, I use certain materials in a specified way, and thereby have produced a practicable working instrument. If, in ignorance, I have claimed too much in this or that direction, doubtless the excess will soon be cut off.

I trust that your editorial note will not deter other experimentalists, or prevent them from protecting the legitimate outcome of their work. For myself, I can only desire that that which is good may stand, but that the false may die.—I am, yours, &c.,

W. J. Dibdin.

Mayfield, Grange-road, Sutton, Surrey, April 23, 1894.

To the Editor.

Sir,—You are to be commended for your outspoken remarks in the editorial note on page 255. It is time some of the claims made with reference to certain patents were contested. It is really wonderful how many *old* notions are continually being brought forward in photography as *new*. Notwithstanding Mr. Dibdin's *patent*, I recommend any one wishing to experiment in this direction to use *any* of the methods referred to, and I can for one furnish evidence of what has been done many years since.—I am, yours, &c.,

G. W. Baskett.

Clacton-on-Sea, April 20, 1894.

MR. PRINGLE ON DEVELOPMENT.

To the Editor.

Sir,—Referring to the report of my address to the West London Society on Development, I ask your leave to make a few remarks. I spoke, as usual, *extempore* and without notes—a system which I follow as saving myself time, and thereby enabling me to get through more work than would otherwise be possible, without, as I sincerely hope, seriously damaging the ultimate effect of my words—and the report, so far as it goes, is excellent. But I wish to point out that in speaking of Mr. Cadett's new, and perhaps secret, developer, "Velox," I very carefully warned my hearers against taking my word about it, because, as I informed them, I had only made a few experiments with this developer—I gave the approximate number—and was bound to speak very guardedly.

Since giving that address I have made further experiments with various brands of plates, and I still find that "Velox" is "remarkable" for energy, but with most plates it has such a tendency to pile on density in the high lights that with these plates it is probably not superior to pyro, and certainly inferior to metol, amidol, &c., for very rapid exposures.

I am quite prepared to admit that I may not have discovered the best way to use this developer. For instance, I have never yet departed from the formula given by the sellers of the developer, and it is quite possible that I have allowed the developer to act too long in the hope of getting shadow-detail. For Mr. Cadett's own plates I do not hesitate to say the developer is most valuable where exposure has been minimal.—I am, yours, &c.,

Andrew Pringle.

LIGHT DIFFUSERS.

To the Editor.

Sir,—In to-day's Journal you mention various means of obscuring the skylight, but I feel assured that you will on trial give preference to the following:—Take ordinary oilshop beeswax and dissolve in turpentine to the consistency of stiff vaseline, smear on glass, and dab over with flannel to stipple. If more density be desired than the above will give, mix any white pigment with it. All papers, textile fabrics, and paints turn yellow with time; but this bleaches white, and is so little trouble to apply that you may possibly see fit to give it a place amongst your standard receipts in the Almanac. If desired to remove, select the first frost of winter, *i.e.*, when the glass is frozen it can then be removed with the utmost facility, but, if left alone, will settle down again in its old place and stick like—beeswax. I am, yours, &c.,

J. D. Cooper.

36, *Clarence-street, Kingston, S.W., April* 20, 1894.

RETOUCHING.

To the Editor.

Sir,—Mr. Carver was justified in writing as he did in last week's Journal *re* my remarks on retouching at the "Central," as reported the week previous in a fragmentary manner.

I am with him in all he states, and hold that retouching, as practised by himself, is an absolute necessity. The report in question in two or three instances misquoted me.—I am, yours, &c.,

Thomas Fall.

9, *Baker-street, W.*

"THE SINCEREST FLATTERY."

To the Editor.

Sir,—Your last issue contains a paragraph, under the above heading, to which I must take exception. The fact is, I was altogether ignorant, until I saw this paragraph, either that any one else had taken a photograph of a similar subject to mine or had entitled it *Water Rats*. My

photograph was taken and named in July, 1891, and has been shown locally from that date. To this fact I have plenty of witnesses.

Mr. F. M. Sutcliff's photograph may have been taken at an earlier or later date, of that I have no knowledge; but the fact remains that my work, whatever its merits or demerits, is in no sense an imitation of his. I must say that I think the Committee should have communicated with me on the subject.—I am, yours, &c.,

THE AUTHOR OF THE OTHER PHOTOGRAPH.

Berkhamsted, April 21, 1894.

NEWCASTLE-ON-TYNE EXHIBITION.

To the EDITOR.

SIR,—Through an unfortunate confusion of two exhibits, we regret to state that an error appears in our award list. In Class H (Lantern Slides) Mr. C. F. Dickinson is credited with a bronze medal, which was really awarded by the Judges to Mr. Paul Martin for a series of six "blocked-out" figure studies. We take this opportunity of tendering our apologies both to Mr. Dickinson and to Mr. Martin for this unfortunate mishap.—We are, yours, &c., JAS. BROWN, W. PARKER BREWIS, *Hon. Secs.*

A CORRECTION.

To the EDITOR.

SIR,—In your report, in last week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, of a paper which I read before the Hackney Photographic Society on *Negative Making on Cut Films*, I notice that no mention is made of the fact that the *various appliances for film working*, which I showed and explained, are, together with the *cold drying varnish for films*, also shown, the specialities of Messrs. B. J. Edwards & Co., of Hackney, and are manufactured and supplied by that firm. As this information is of general interest to the users of films, perhaps you will kindly supply the omission in your next.—I am, yours, &c.,

The Grove, Hackney, London, N.E., W. H. BARNES.
April 24, 1894.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

Louis Oberg, Manchester.—*Photograph of Mrs. Hales Robinson.*
William Warneuke, Glasgow.—*Photograph of Scottish Orchestra.*
James Martyn, Southwold.—*Three photographs of black and white Kitten.*
Drury Stowe, Bedford.—*Photographs of the Howard Statue and the Unveiling.*
Peter Charleton, Newbridge.—*Photograph of the 9th Queen's Royal Lancers' Scroll.*
Abraham Flatters, Openshaw, Manchester.—*Six photo-micrographs of wood and paper pulp.*
G. Bell & Son, Glasgow.—*Photographs of the Scotch and English International Football Teams*, 1894.

BROMIDE.—If the blocking is *really* in silver, it is not likely to have any injurious effect.

B. W. ANNABLE.—Have the copyright assigned to yourself, and then, without any further steps, you have the sole right to reproduce the picture.

H. STOKE.—Ordinary water colours, mixed with albumen, will answer. Colours specially prepared for the purpose are supplied by most dealers in photographic goods.

BELLA.—As you do not say of what the varnish is compounded, it is impossible to tell you what to add to improve it. Let us know of what it is made; we shall then be pleased to help you.

A. REID.—The defect in the negatives is due to the lens having a flare spot. It is easily remedied by altering the position of the stop, either further from or nearer to the lens. The best position will be found by experiment.

IN DOUBT.—If you group the two existing portraits together so as to make one picture, you can copyright the group as a whole. As we have said elsewhere, American photographs, for which copyright has been obtained, are usually marked as such.

A. C.—To mount prints on a very thin board or on stout paper, starch the backs of the prints, allow them to become dry, then, having slightly moistened the mount, press into contact by means of a screw press. Thus mounted they will remain flat.

T. O'NEIL.—If the nickel plating is coming off the rollers of the press there is no way of preventing it. The only thing that can be done is to send the rollers to a nickel-plater and have them replated, or better still, perhaps, to the makers of the press for them to do the work.

N. O.—We cannot say whether the discount mentioned is the largest that dealer allows. As it is what he quoted, we conclude it is the most he will allow you. If you are not a dealer or a professional, why should you be entitled to anything more than an ordinary cash discount?

T. WELPDALE.—If the railway authorities say that the injury to the negatives is the result of careless packing, and you agreed with them that such must have been the case, you will have to look to the firm who returned them for compensation. In future, when a parcel is delivered in the state as described, the best way will be to refuse its acceptance, and give notice to the parties concerned, and let them settle the matter between them.

D. DAVIES asks if the speeds marked on the packets of dry plates by the makers are to be relied upon—that is, if the speed given by two or three makers be the same, will the exposures required be identical?—They ought to be; but whether they are or not can only be determined by experiment—an experiment any one can try for himself.

EXPERIMENTALIST asks "if the specifications of patents can be purchased, and if so, at what price? If not purchasable, can they be seen at the Patent Office on payment of a small fee, the same as wills can be seen at Somerset House?"—Copies of all specifications, as they are published, can be purchased at the Patent Office for 8*d.* each. Before the specification is published, if it has been "accepted," it can be seen on payment of a fee of 1*s.*

DISTRESSED OPERATOR.—It was very injudicious to send the specimens to an anonymous advertiser. The only thing we can see that can be done now is to write to the Inspector of Police of the district to which the prints were sent, giving him full particulars, and ask his immediate attention to the matter. Several specimens have been promptly recovered in this way. Obtaining specimens in the way detailed is fraud, and punishable as such.

A. H. W. says: "I shall feel greatly obliged if you will inform me—1. Of a good silver intensifier for gelatine negatives. The one I have been using is Farmer's, recommended in a book entitled *Photography in a Nutshell*, which I find to work very slowly. 2. Whether the incandescent gaslight (Welsbach) is a suitable illuminant for enlarging through a six-inch condenser, in place of the ordinary oil lamp.—In reply—1. Monckhoven's silver intensifier as given at page 884 of the ALMANAC for 1894. 2. Yes.

S. A. says: "There is an old engraving of our village—now a small town—in the possession of a neighbour of mine, which is over a century old. He will lend it me to copy for publication, but I am afraid to accept the offer because he last year lent it to another photographer, and he copied it, and is selling the copies, which he claims are copyright. What say you?"—Possibly the photographs may have been made copyright, but that will not prevent any one else from copying the original again, or as many as choose may do so. If they were to copy the photograph, that would be different. Our correspondent may copy the original to his heart's content, and may, if he like, register a copyright in his reproductions.

PHOTOGRAPHER (Alton) says:—"I am troubled very much (at night in particular) with a very unpleasant itching feeling in my hands, due, I have no doubt, to the constant use of bichromate of ammonia. I should feel very much obliged if you could suggest any ointment that could be applied to give relief. I think an ointment would be preferable to a lotion, as I could keep my fingers bound up."—If the irritation is caused by the use of the bichromate, we know of no better ointment to apply than nitrate of mercury ointment, the unguentum hydrargyri nitratis of the *Pharmacopœia.* It should be applied very sparingly, and well rubbed into the skin. As a lotion to allay irritation, the following is good:—Alcohol, 5 ounces; carbolic acid, 1 drachm; glycerine, 4 drachms.

E. HUSBAND writes: "May I ask for a little information upon two subjects connected with our art? 1. Is any permission needed to make a negative from a French photograph, there being no notice on the photograph that it is in any way copyright? 2. Am I right in thinking that the finest enlargement, with the greatest amount of detail in it, can be obtained from a magic-lantern slide (making, by contact, a negative from the enlarged positive), rather than from the original negative from which the slide was made?"—1. Certainly, if the photograph is copyright. It is not necessary that a copyright photograph should be marked as such. 2. A good lantern slide is not the best transparency for enlarging from. If the enlargement be made direct from the original negative, as a transparency, and from that a negative is printed, the fullest detail ought to be secured.

NEMESIS says: "I should be much obliged if you will kindly answer the following in your inquiry column. I have a lot of old sensitising baths for paper full of organic matter and nitrates, and for testing which the argentometer is useless. Would not the best plan be to throw down the silver in the form of carbonate with bicarbonate of soda, wash well, and then redissolve with nitric acid? Would bicarbonate of soda precipitate all the silver? Would any of the silver carbonate dissolve if several changes of washing water be used, and would there be any trouble to obtain a neutral solution of nitrate of silver, provided not sufficient acid be added to dissolve a slight residue of silver carbonate left after all the rest had been converted into nitrate?"—In reply—1. Bicarbonate of soda will precipitate the whole of the silver as carbonate. 2. Carbonate of silver is slightly soluble in water, but if the washing waters be added to the residues the silver will not be wasted. In redissolving, the nitric acid should be added cautiously, so as to leave a little undissolved carbonate. The solution should then be filtered, and it will probably show an acid reaction from the presence of carbonic acid. But that is of no moment.

*** Editorial Table, several answers to correspondents, and other communications unavoidably held over.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1774. Vol. XLI.—MAY 4, 1894.

PHOTOGRAPHING STARS WITHOUT A TELESCOPE.

STELLAR photography has, in the minds of photographers, been usually associated with the employment of elaborate and costly astronomical appliances, and correctly so when results of scientific value are sought for. But there is another view of the subject which may be taken, which, although not perhaps scientific in the strictest sense, is yet fraught with interest and instruction; we refer to the photographing of the heavens with an ordinary camera and lens.

Some valuable reproductions of the brighter of the heavenly bodies may be obtained by an almost instantaneous exposure even even by a landscape lens. As "one star differeth from another in glory," it will readily be conceived that, with a lens embracing a wide angle and worked quickly with a small stop, only the stars of the first magnitude, *i.e.*, the maximum brightness, will be depicted under the circumstances.

About two months ago, when the constellation Orion was spread out so temptingly before us at a convenient hour in the south-eastern heavens, we, on several occasions, responded to what seemed a photographic invitation, and had not a few shots at this resplendent group, which embraces an angle capable of being included by almost all lenses. Trying one lens after another, we ultimately gave preference to a Voigtlander portrait lens of six inches diameter and long focus, on account of its great light-grasping power. And here we may observe that the only effect of a large aperture is to increase the apparent luminosity of the image of a star; neither aperture nor focus can affect its size, for the disc of a fixed star cannot be obtained.

But here an anomaly is introduced. Although even a powerful telescope fails to show a star otherwise than as a mere point, and the same may be said of a photographic lens of the highest quality in regard to its visual image, yet by the latter, when employed photographically, that is, when the focus falls on a sensitive plate, the image of the stars of varying brightness have actual magnitude imparted to them. Visually, and when viewed through an eyepiece, the images of the faintest and most delicate stars are only mere points—just the same as that of one of the first "magnitude;" but, upon developing an image of them thus impressed, brilliancy is found to be converted into dimension, and hence everything is so differentiated by a nice discrimination that, when a photograph of the subject is shown on the screen by the lantern, it is the same as if one were looking at the starry heavens, each orb being seen with its own special brightness, from the most luminous to the most feeble, as to be barely discernible.

This phenomenon is easy of explanation. A bright star image falling upon a layer of silver bromide exercises a lateral action upon the atoms of silver bromide immediately surrounding those which received the impact of the light, and the the greater the luminousness of the impinging image the greater the distance from the point of contact does the influence extend by the lateral reflection. The result of this is that a star which is so feeble as only barely to impress itself has not power to cause its image to be reflected on to the surrounding atoms, and therefore remains of minimum dimensions.

By the employment of a large lens a much greater number of stars can be secured on a plate by a drop-shutter exposure than when a small one is used. Depth of definition is not a factor in stellar photography, for all the objects of attack, although probably countless millions of miles apart from each other, are for photographic purposes practically on one plane. Flatness of field forms the great desideratum.

It sometimes happens—and we found it notably so on one occasion—that spurious stars appear in the negative, that is, minute dirt spots in the film. These can be discovered by taking a second negative without disturbing the position of the camera, and then comparing one negative with the other. If a time exposure were given, which would be necessary with a lens of small aperture, the star photograph, instead of being represented as a circular dot, would be prolonged like a hyphen (-), the amount of elongation being determined by the duration of the exposure. Where duration of exposure is necessary is in the case of photographing stars too remote to impress our sense of vision at all, and then this must be done by having the camera mounted on an equatorial stand, and rotated by clockwork. This kind of stellar photography, however, is not that which we are advocating at present, which is that kind at the command of every one who possesses a camera of any kind.

We remember how, when a photograph of the moon was desired, it was necessary to give an exposure amounting to one or more minutes. Owing to the motion of our satellite, it was necessary to have the camera on a stand equatorially constructed, and to keep the camera in motion during the exposure. Were this not done, an oval moon would result. At the present time, when plates of great sensitiveness are at command, the queen of the night can be photographed by a drop shutter, the same as a well-lighted white cloud, for the luminousness of both seems nearly alike. This class of photography, too, forms an interesting pursuit. With a good portrait lens of large aperture and long focus, singularly pretty lunar productions may be obtained by an exposure so nearly bordering upon instantaneity as to bear a considerable degree of subsequent enlargement. Of course, as the image will be confined to the centre of the plate, no stop need be employed.

The great value of the Petzval portrait combination is now being recognised by astronomical opticians, for its covering power greatly exceeds that of any of the telescopic objectives, no matter how perfectly they may be constructed otherwise. They are corrected for axial rays only, which is different from the corrections introduced by Petzval.

UNIFORMITY IN DEVELOPMENT.

The Light.

In the endeavour to obtain the highest degree of excellence from any brand of plate, a goal which every one ambitious of complete success will naturally strive to attain, it is, above all things, necessary that from beginning to end of the process of development every operation, every condition, every chemical, should be conducted and used under the most uniform conditions possible. A glance, however, at the laboratory, and the modes of work of a large number of photographers will conclusively show that, whatever their means to possibly meritorious ends, uniformity is not a prevailing characteristic. We purpose lightly glancing at some of the conditions in which greater uniformity may be attained without sacrifice of comfort or rapidity of working—indeed, the latter quality may be well increased if the desideratum we are discussing be well carried out.

The subject of light in its connexion with the work naturally claims treatment first; and, again, first should be considered light as it affects the eye. It is not every one who can adopt the plan of developing or having developed a large number of plates at once, and yet it must be said at the outset that, unless the eye has a certain amount of rest in darkness, or comparative darkness, its power of gauging the opacity of a negative is neither uniform nor at its best. The operator who exposes a plate or two in a studio, and at once proceeds to develop it, is at a disadvantage compared with his brother worker at landscape, who brings home his negatives and develops plate after plate under uniform conditions of eye rest. The sensitiveness of individual retinas in this respect varies enormously, just as does the power to look without flinching at a strong light. The eyes of some photographers are almost useless to them on first entering their dark room, and until they have become well rested from light fatigue. We know, for example, one photographer who finds it utterly impossible, under the conditions of his dark-room illumination, to judge of the depth of his negatives if, for example, he has been reading in a strong light shortly before proceeding to the use of his pyro. Another tells us that, having found, on several occasions when he came to develop a batch of plates, that he was utterly unable to judge of the condition of his plates, he was compelled, when the critical period of the attainment of sufficient density was being neared, actually to pass them over to his assistant for his opinion. After well thinking out the matter, he discovered that this happened whenever he had, just before going into the dark room, been examining and sorting a batch of negatives by holding them up to the light. His eye had become so fatigued as to be unable to differentiate degrees of shade to any important extent.

Those whose retinal sensibility is less than thus described will have some difficulty in appreciating the force of our remarks; but that they are true is undoubted, as is also the fact that they point to a very important factor in conditions of uniformity. It would be easy to fortify our position by reference to ophthalmological treatises; but, instead of doing so, we may quote from a paper by Mr. P. L. Gray, B.Sc. A.R.C.S read only a week or two before the Physical Society. His subject was on "The Minimum Temperature of Visibility. The visible limit at the red end of the spectrum varies greatly for a normal eye, according to its state of preparation; he says "Exposure to bright light diminishes the sensibility of the eye and darkness increases it." As an example, in a concrete form of the extent of this variation, he states, "That for the less sensitive condition (of the eye) the minimum temperature of visibility for the surface of a solid is about 470° C.; but this may be much reduced by even a few minutes in a dark room that at night a surface of 410° is visible, and that by resting the eye in complete darkness this may be reduced to 370 nearly." And again, "different people's eyes differ somewhat in their minimum temperature of visibility, but probably not to any great extent if tested under the same conditions as to preparation," &c.

This recountal of the results of a large number of experiments, particularly that showing that a difference equal to the increase in light, brought about by raising the temperature one hundred degrees, was inappreciable under some conditions of retina fatigue, show that the preparedness of the eye for developing must be a most important matter when it is desired to obtain results as near alike as possible, for example, to speak of a matter germane to our subject, when preparing a series of lantern slides.

Hence the conclusion must necessarily be drawn that for obtaining negatives of fairly uniform depth, or a set of slides uniform in quality, it is essential to act upon the indications these results give. Before commencing work in the dark room let the eyes be rested by abstaining from looking at bright objects, let a strong light to illuminate the measuring vessel be kept from the eye as much as possible, and finally, and above all, while at work in front of the developing sink, let no strong light from sky or gas shine direct upon the operator's face. Granted these conditions, and the first steps towards the desired results are made; the others we will dwell upon in a future article.

COLOURLESS DEVELOPING SOLUTIONS.

In the early days of gelatine plates, when the custom prevailed of using the pyro in the dry state, the question of discoloured solutions scarcely troubled the photographer. No sooner, however, was the practice instituted of keeping the developer in stock solutions than trouble from this cause began to be experienced. Although nothing is easier than to prepare a practically colourless solution of pyro if the task be properly undertaken, nothing, on the other hand, is easier than to impart to it a considerable amount of colour by carelessness during the process.

Pyrogallic acid, it is scarcely necessary to remark, of all the developers in present use, is the one that requires the most care in the preparation of its solution, and the one which, if improperly mixed, produces the most serious harm in the resulting negative. Unlike the more recently introduced developers, such as hydroquinone and the phenol derivatives, pyro in the course of oxidation not only discolours, but deposits a copious brown sediment, whereas the others remain clear, or if they throw down any precipitate at all, it is of a colourless nature. To the formation of this insoluble deposit in the gelatine film is to be attributed the strong tendency of pyro to cause the troublesome brown stain for which it is so well known

To counteract this tendency, the addition of sulphite of soda was recommended by the late Mr. Herbert B. Berkeley some twelve or fourteen years ago, a purpose for which it is admirably adapted, although there are still some operators who decry its use. As far back as 1877, when experimenting with M. Jammann's "hydrosulphite" developer, in the preparation of which bisulphite of soda was employed, the peculiar property of the latter salt in preventing the formation of this objectionable deposit was pointed out, although at that period, when collodion plates were in general vogue, the tendency to stained films did not exist, and consequently this particular application of the sulphites had no practical value.

To those who recollect the character of too many of the gelatine negatives produced fifteen years ago, it seems surprising that the value of sulphite of soda in preventing the colouration of the gelatine should have remained unrecognised for so long a time as it did after Mr. Berkeley first pointed out its utility; but so it was, in spite of the truly horrible character of the stain experienced in those days. When, however, its value came to be recognised, it was not long before its use became practically universal, and "stock" solutions of pyro came into general use.

About the same period, or perhaps anterior to the introduction of sulphite of soda for the purpose alluded to, nitric acid was put forward as a pyro preservative, in which capacity it is still employed by many; but the difference between the two agents may be summed up thus, that, whereas sulphite of soda acts as a most efficient pyro preservative, as well as preventive of discolouration, nitric acid is only partially effective for the former purpose, and has practically no effect in preventing stains.

But, although sulphite of soda came into general use, it was some time before full advantage was taken of its properties, and, though matters were considerably improved so far as stained films were concerned, the evil was not altogether removed. It was no uncommon thing in those days to see stock solutions of pyro that differed but little in colour from bottled stout, solutions with which it was scarcely possible to expect perfectly clean films. The fault lay mainly, though perhaps not entirely, in the method of mixing the solutions. In the first place, insufficient care was given to the nature or quality of the material employed so long as it was *called* sulphite; it might be, and frequently was, largely composed of sulphate and carbonate—indeed, one sample we examined actually did not contain as much as five per cent. of real sulphite. It is needless to say that, under such conditions, a colourless or keeping solution of pyro was an impossibility.

Although at the present day more attention is given both by dealers and consumers to the nature of the salt used as sulphite, there is still room for some little more care in its use, for, with precisely the same ingredients employed in exactly similar proportions, it is quite possible to mix up solutions of a totally different character. In the first place, the so-called neutral sulphite of soda is almost invariably more or less alkaline, and so employ it in that condition is inevitably to ensure a certain degree of colouration, to commence with, and, as a matter of course, a steady increase as the solution becomes older.

Before dissolving the pyro, the solution of sulphite should invariably be rendered slightly acid. Almost any acid may be employed, and in quantity sufficient to neutralise any free alkali present and liberate a faint trace of sulphurous acid by decomposition of the sulphite. When the solution smells very faintly of sulphurous acid, the right point has been reached. If such an acidified solution be poured on to the dry pyro, and the whole gently stirred until it is dissolved, the resulting solution will be as nearly colourless as it is possible to obtain it, and, if carefully preserved in a well-closed bottle, it will remain in that condition for a practically unlimited period. We have used pyro solution thus preserved which has remained almost colourless and retained its full developing energy for a period of over four years, whereas the solution preserved with nitric acid will often turn completely black in a week.

It cannot, of course, be expected that the stock solution of pyro in constant daily use will retain its original freedom from colour as well as that kept corked, since every time the bottle is opened its contents are brought into contact with the atmosphere and of course subjected to more or less oxidising influences. It is desirable, therefore, to keep a small bottle of solution for daily use, filling it from the larger stock as often as may be necessary. It should, in fact, be borne in mind that every time the bottle is even shaken it has a tendency to promote the discolouration of the contents.

If the preparation of an acid solution of pyro requires care, what may be said of one which is in a strongly alkaline state, as in the case of one-solution developers? Yet it is quite possible to prepare a concentrated pyro developer in one solution that will remain quite colourless for a very considerable period if well corked, and will scarcely appreciably discolour in use if carefully handled. In order to attain this end it is only necessary to prepare the acid solution of pyro in the manner already indicated; the alkali, carbonate of soda or carbonate of potash, is then introduced in the solid state, and the bottle, which should be quite full, instantly corked. In this manner the solution, before it becomes sufficiently alkaline to discolour readily, is fully protected from the atmosphere, and so long as that condition of affairs is maintained it will remain nearly colourless. When ammonia is the alkali employed, it is almost impossible to avoid a very slight colouration, though it need not exceed the creamy tint of sparkling Moselle. In this case the bottle should be nearly filled with the slightly acid pyro solution, leaving just room enough for the ammonia which is then introduced by means of a tube or pipette to the bottom of the bottle, the object being to avoid mixing at the surface and in contact with the atmosphere.

With the other developers there is, of course, less difficulty in preparing and keeping colourless solutions than with pyro, though even with these, and especially hydroquinone, some care is necessary in order to preserve the absolute purity of the solution. It should be borne in mind that, when discolouration occurs, however slight, it is sure to increase with time, however great the care that may be taken, hence the importance of avoiding it in the first instance.

The same observations apply to the newer developers as to pyro, but there is a source of danger in the case of the former that does not exist in conjunction with the latter and this is more particularly so with one-solution developers or those in which the alkali is combined. We were a short time back surprised at the rapid and complete discolouration of a bottle of stock developer that had been standing unused for some days. Although several months old, it had only within the few days shown any sign of colouration, but during that period had reached a deep brown tint. The cause was found to lie in the fact that in pouring out some of the contents for use some crystals of the developing agent that had been deposited during the cold weather had been left clinging to the sides of the bottle

above the level of the solution, and these, having become oxidised and blackened, the colour had trickled into the solution and so brought about the change. It is advisable, therefore, in using a solution which has deposited crystals, especially hydroquinone, which is particularly liable to behave in that manner, to take care that none are shaken up on to the sides or in the neck of the bottle.

The New Director of the National Gallery.—Mr. Poynter, R.A., has been selected to succeed Sir Frederick Burton as Director of the National Gallery. As the majority by which he was elected is stated to be a very narrow one—Mr. Sidney Colvin, Keeper of the Prints at the British Museum, being the other candidate—opinions on the choice are naturally diverse in art circles.

Polar Expedition.—The Wellman polar expedition is now well on its way. It sailed one day last week for Spitzbergen, *viâ* Tromsoë. Scientific research is one of the principal objects of this expedition. It is accompanied by an astronomic observer, geologist, meteorologist, photographer, medical officer, &c. It is to be hoped that the enterprise will prove as successful as it promises to be. By the way, photography in the extreme northern regions is a very different affair from what it was when wet collodion was the process that had to be employed, thanks to gelatine.

The Sunday Exhibition of Pictures.—A fortnight ago it will be remembered, we mentioned that the Common Council had, by a very narrow majority, decided to open the Art Gallery on alternate Sundays. As a result, two thousand four hundred persons availed themselves of the privilege on the first day. It may well be expected that the numbers will be much greater as the fact that the collection can be seen on Sundays becomes better known. England cannot boast of many picture galleries, and it would be a boon to many if more of them could be visited on the only day of the week upon which they have the opportunity.

The City Companies and Photography.—Before now some of the City Companies have shown a friendly spirit towards photography, as witness the loan by the Drapers' Company of their hall for the purposes of an exhibition four years ago. Now it is the Cordwainers' Company which has extended a helping hand to the youngest and most promising of modern arts. This Company kindly placed their magnificent hall in Cannon-street at the disposal of the Affiliation of Photographic Societies, for Mr. Wall's two lectures on colour photography on Friday and Monday last, and in various other ways helped to make the lectures the success they undoubtedly were. The thanks of all interested in photographic progress—and who is not?—are due to the Cordwainers' Company for its assistance on this occasion.

An Academician on Process Work.—Professor Herkomer is evidently no great friend to photography. In a recent speech he characterised photogravure as a "very evil thing." At the annual dinner of the International Society of Wood-engravers a few days ago, he made some strong comments on process work. He said that "the exchange of art work for the mechanical process was spreading like a microbe over the world of art illustration. They, however, must not allow the trick to be accepted for the real thing," and added that "process work should be used for the production of line alone, leaving tone work to express the more complete work of the artist, which should be rendered again by an artist engraver, whose work would be too good to throw into the wastepaper basket." Very good, Mr. Herkomer; but which do the public prefer in their weekly illustrateds, the present process blocks or the wood engravings of a few years ago? Again, which method the more correctly translates the originals?

Photography *v.* Drawings.—In the evidence given in the Police-court one day last week, in connexion with what is known as the "Grafton-street Crime," drawings were produced which had been made under the direction of the divisional surgeon engaged in the case. One would almost have imagined that, instead of drawings of the injuries the deceased man had sustained, photographs would have been far more satisfactory, and would also be considered more reliable by a jury. We have before now commented on the fact that the police authorities take far less advantage of photography than they might do with great advantage in furthering the ends of justice. Why should not the Home Office have an official photographer to undertake special work such as that just referred to? A photograph of a scene immediately after a crime has been committed would often prove valuable evidence, and a divisional photographer might be appointed from the local photographers of each district to officiate as occasion may require in the same way as divisional surgeons now do.

The Projected Picture Gallery.—In the House of Commons, on Friday last, the First Commissioner of Works, in reply to Mr. Stuart Wortly, detailed how the site of Millbank Prison was to be disposed of. It appears that about two and half acres of the space are to be devoted to the new picture gallery. The spot is certainly not, at present, a very lively one for Mr. Tate's gallery. The space allotted for pictures seems large, but there is little doubtbut that it is not a bit too large. With regard to the portraits, we have before suggested that a portion of the building when erected should be set apart for photographic portraits of literary, scientific, and other celebrities, of whom the nation is never likely to possess oil paintings to hand down to prosperity. Photography now includes at least two processes—carbon and platinotype—that may be considered absolutely as permanent as oil pictures, and why should not they be utilised? It is to be hoped that this subject will not be lost sight of in allotting the space in the new building. In England men who have distinguished themselves in the world of science are too quickly forgotten. This is not the case in some foreign countries.

Stock Cloud Negatives.—The seasonable weather—sunshine and showers—we are now having is a glorious opportunity for securing a stock of cloud negatives for printing into landscape pictures. About the time of the equinoxes has often been recommended for securing cloud negatives. That period is usually a good time for obtaining them, but as studies of clouds only; as a rule, they are too pronounced for anything but wild and turbulent scenery. What is required for a bright, sunny landscape picture is brilliantly lighted and delicate clouds, not heavy ones, such as are indicative of a rising storm, and which one sometimes sees printed into a quiet and placid landscape, and early in May is about the best time in the year to obtain them. Some photographers will go on, say, a Saturday afternoon outing, and not expose a single plate on account of an unexpected change in the elements; but, had they directed their attention to cloudland, they might have found ample use for all the plates they had with them—and more too—in securing a stock of cloud negatives from which to select according to requirements, instead of, as is sometimes the case, having to utilise two or three for all purposes.

DEVELOPED SOLIO PRINTS.

Since the announcement in our pages a fortnight ago concerning the method of development of Solio prints, we have tested its value in a practical manner by exposing, developing, and finishing several prints. In doing so, we adhered to the directions given in the article referred to on page 231.

First of all, we may say that there is absolutely no difference in appearance that we can discover between a completely printed-out Solio print and one that has had only a brief exposure in the printing frame, and been afterwards finished by development. This is important to observe, because for a long course of years, indeed, ever since the practical commencement of photography, developed posi-

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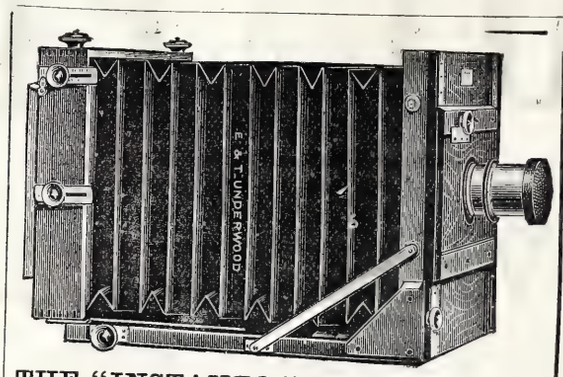
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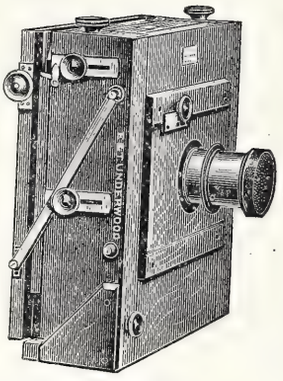
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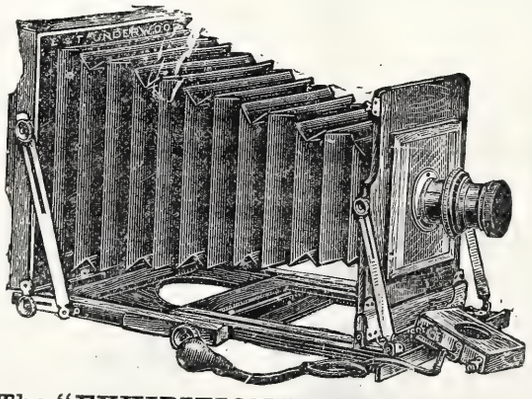
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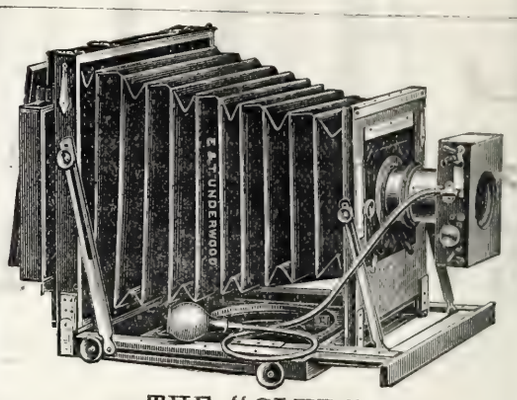
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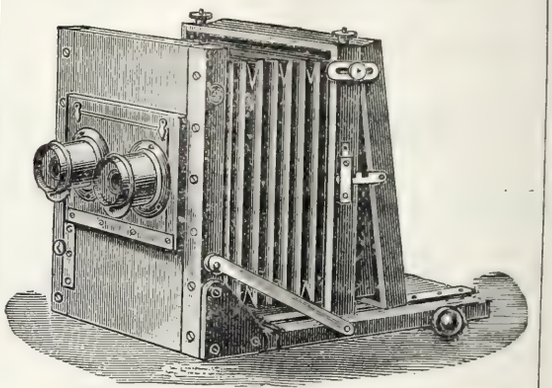
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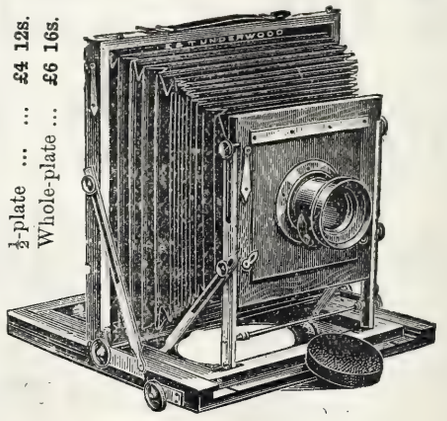


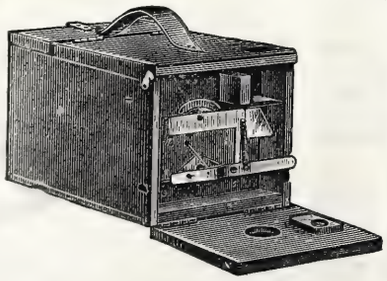
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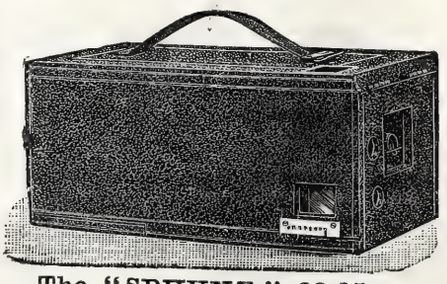
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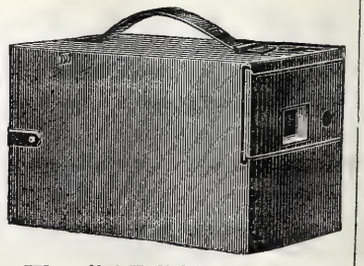




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tives have been associated with heaviness and smudginess in the shadows. This was a characteristic of the developed positives of Sir William Newton in 1853; it also characterised those made a few years later by the process of M. Henri Claudet, who employed bichloride of mercury in the salting of his paper, and protosulphate of iron as the developer. It was, we believe, the late Mr. Thomas Sutton who, when a partner with M. Blanquart Evrard in their developed-out printing works in Jersey many years ago, established the fact, never since disputed, that a print which had been developed was more permanent than one that had been printed out.

There being, then, to put it negatively, no loss of *quality* in a developed Solio we have now to inquire into the probable positive gain. This may be told in a few words. The saving in time is very great, and with most photographers time is money, more especially so when the light is dull and prints are being urgently demanded by an all-too-impatient public, who are apt to clamour over delays in the execution of their orders—delays, the cause of which they cannot readily be brought to understand. This is an immense gain, and one which may roughly be estimated at three hundred per cent., for, in all our trials, the printing was carried so far only as to show that all details were visible, however feebly so. The developer did the rest.

All of our trials were made on paper that had been recently sensitised—all but one. This one was a portion of a packet we received from the Eastman Company on the opening day of the Convention at Edinburgh, viz,, July 11, 1892, and it forms not the least delicate of the charming series. The tones can be varied at will. Those we aimed for and got are a delicate purple-brown, in all but one instance, where a darker tone was considered to be more suitable for the subject.

When first immersed in the developing solution, the image seemed as if it were going to totally disappear, but it rapidly regained strength, and continued doing so until we judged it time to stop the action, in this respect reminding one of the effect witnessed while gilding a Daguerreotype. We are much pleased with the results obtained, the most subtle tints in the faces and drapery being well secured.

SELECTION OF SUBJECT.

[North Middlesex Photographic Society.]

We may approach this subject with a free and open mind, for even the most severe opponents of the relative position which photography holds in art have conceded that, up to the point of selection of subject, we are on a par with the other exponents of the graphic arts.

But it must not be forgotten that we labour under distinct disadvantages, for we have to take nature practically as we find it, and this should make us all the more careful; for we cannot say to these objectionable features, be they telegraphic post, lamps, factory chimney, and many other things which will readily present themselves to your mind, Be gone; and we cannot render distances upon one or another plane at will, as is frequently done by artists of the brush. We have to resort to other means, and may have to wait for another day, when there may be a mist or some other atmospheric condition with which to deal with an otherwise excellent composition; or we might perhaps overcome the difficulty by using a lens of different focal length.

These remarks are by the way, and I will now proceed to treat the subject, particularising the advantages to be made the most of, also those which will be examples for us to avoid. There should be a distinct motive in our work, some fact to convey or some sentiment to reveal.

This, I think, should be the sole aim of the pictorial worker, a "something" with which it is, at least, our intention to stamp our work so that to others it may be apparent—*that* which causes us going to the time, work, and expense of many processes which are necessary to the production of a photograph. This brings me to a point—that is, that photographers are mainly divided into two classes: those who take it up as a pastime or hobby with which to while away their leisure hours, and those who approach it as students, and it is to the latter that my remarks apply in particular. In regard to the former, there is this to be said in their favour, they frequently vert to the latter; but still there are many who will never get beyond the pleasures of photographing groups, bad portraits, and heir ideas of landscape work do not soar far beyond the rural church and the magnificence of the local houses of call. Of these, gentlemen, I do not wish to say anything, but it would be well for them to ask themselves the question as to whether they consider that they are doing anything to benefit photographers, also if they advance any one's interest with the exception of the plate-makers and photographic dealers.

The general branches of photography, as you well know, are architecture, portraiture, *genre* study, and landscape. I consider that the good all-round worker is seldom met with, and ask you whether, to ensure success, is it not well to ascertain that which you have the aptitude for, and to work at this with all your energies?

Architectural Subjects.

You must as a rule take these as you find them: but, bear in mind that an angular position is the best, owing to the results presenting a more desired effect in perspective, as well as the light and shade being more pleasing. In this, as I think in all cases, it is advisable to use as long a focus lens as is consistent with and including sufficient of the subject. With regard to these subjects, I consider that a portion done well is better than an indifferent whole. It is seldom that you find a photograph of an entire cathedral or church which conveys that interest of size or vastness which you see in the original, and I consider that a smaller portion, where it might be possible to illustrate some particular style or period, preferable, and thus to stamp your work with the motive which prompted it.

Portraiture.

This is a branch upon which I am not competent to offer you any remarks, save, perhaps that there is a wide scope for advancement to those who are inclined in this direction, in that which is known as home portraiture, taking in the actual surroundings of your sitters' daily life. These, I think, would tend to convey to others who value a portrait something more than the stereotyped studio work usually met with.

"Genre" Study.

This is a vast field, and one which possibly is the most difficult to render satisfactorily. It is strange that even the results of many, even of the best, workers seem to present a self-consciousness that they are being subjected to the ordeal of being photographed. This to my mind, is the greatest difficulty to overcome.

I may advise those to whom these subjects appeal to select those of rest and repose, and not attempt to convey the impression of motion, for this is well-nigh impossible. The lens and sensitive plate are too quick for the eye to appreciate the sensation which is the result of a rapid shutter exposure; truthful as it may be, it will not convey that to which the eye is accustomed.

Witness the result of hand-camera work, more particular as to the manner in which it portrays street life. Now, do not these in the majority of cases give almost grotesque results? Does a man, with perhaps one leg lifted, give the impression that he is rapidly progressing? I venture to think not; and in many cases, only too frequent, does it not approach the ridiculous?

Landscape

I now arrive at the division for which I claim your attention. Here it is that workers are more likely to excel; but—and there is generally this—it is essential to know the limits of our art. Here experience, often dearly bought, comes in. When we look—and perhaps with regret—through our stock of negatives or prints, is not this question brought readily to our minds, Why did we take this? it's not worth the trouble. Had this sentiment been present in our mind previous to exposure, we should not have gone to the pains that we have done. It is so easy to take a photograph, but to produce a pictorial result is another thing altogether. It occurs to me that we are frequently too active, and I say that time spent in picture galleries is distinctly profitable. When there, do not look superficially at this or that picture, but try and analyse it, try and find out that which makes it what it is. It may depend upon many things, such as its composition, light and shade, colour, tonality, &c. Do not try to find its locality, for I think to do so is not wise or, in fact, honest, with the idea, even if it were possible, to produce a similar result; rather try to apply the knowledge that you have gathered in some new direction, and I think that you will then reap a richer harvest. I ask you to give attention to simple subjects in preference to romantic scenery; this may appear strange to you, but of those places or districts in which the latter is prevalent I feel convinced that photography does not do justice. To those who have photographed, say, the Lynn Valley, Lake District, and many other noted beauty spots, I ask them, do their results give the idea of

vastness, space, and grandeur that they saw in nature? I venture to think not. I have tried such localities, and who has not? this is an error into which most of us drift.

I ask you to give your attention to marsh, moor, heath, and fenland, also the estuaries of our many rivers, particularly those of the Eastern Counties. You will find these strange at first, and probably will not see anything to do. Watch these places under different conditions of light and atmosphere; that which perhaps looked flat and uninteresting before will be turned into a thing of beauty with the glory of the setting sun; watch those reeds and hazy distance, they become changed into a perfect picture, and one which it will be in your power to give an approximate rendering of.

I am afraid there is prevalent amongst photographers the same idea that there is with cyclists, viz., the miles we travel; and I feel convinced that, once you have found a district which satisfies you, the more frequently you visit it the more you will become enraptured with it.

Do not forget "that nature does not always sing in tune," and it is not on every occasion that you will be able to take home your full complement of plates to develop. With all this, however, your knowledge of nature will be more matured, and thus you will be able to apply it upon a future occasion. The general laws of composition are well known to you, and therefore I shall but briefly touch this portion.

There is an idea, which I have carried out for some considerable time, and have found great assistance from. This is to rule on the focussing screen three equal divisions each way; where the lines intersect should be the strong point of your composition, and as the horizon should never be in the centre, but rather above or below, it will give you great assistance in what to avoid in this way.

In addition to this, I rule my notebook in the same manner, in this roughly sketch in outline the main lines of the composition, and outside indicate the position of the sun, also noting whether there be any particular portions which might require special treatment in development.

This becomes a permanent record of the exposure, and, should there not be clouds in the negative, it gives me the particulars of those I may need to secure for combination printing. This has proved useful to me, and I think you will find it so if you but give it a trial.

You all well know that the principal object should not be central upon the plate, and that straight lines and the repetition of them should be avoided; but I may mention that these rules have frequently been violated altogether by many artists, and yet their results have been considered masterpieces.

I am afraid that I shall now be wandering away from the subject, but still consider it essential to mention this: viz., the principal focus should be upon the subject or impression which you intend to convey, and therefore I advocate using as large an aperture of the lens as is consistent with this. There is a medium in all things, and I do not advocate blurring. There is this, however, to remember, that your photograph should possess, in the majority of cases, foreground, middle distance, and distance. Now, to render all these with equal distinctness is untrue to nature and to art. The foreground is your most important point, and to this you cannot give too much attention, for with it you will give a character or style to the work you undertake.

I ask you now to consider the subject of lighting for a moment. It is a recognised fact that, in many negatives, the scale of light is more than can be reproduced by any printing process yet made; consequently it behoves us to consider whether it is not better to take advantage of the opportunities for work in early morning or evening, for, at these times, it is more possible to get a closer approximation of the true values of the subject.

Take advantage of little things; it may be a winding path, cart, ruts filled with water perhaps from recent rain, or little water courses left in the mud by the ebbing tide, and many others which will present themselves to your mind. Small as these may appear, in the results they will apparently carry the eye into the picture, and perhaps further, that is, beyond, in the imagination.

Be careful to include the tops of trees. This is important, and you will notice it if you compare results with those which do not. These latter represent to my mind that, instead of being out in the field, I am looking at nature as from a window.

Also, be careful not to include overhanging branches of trees, the trunk or main portions of the structure not being included. This is a frequent difficulty, and one which, if it cannot be avoided, should decide us to leave it alone, as it is fatal to expect a good result.

Too much importance cannot be placed upon your treatment of the sky. By this we most frequently give the keynote to the whole, and by this your picture will possibly tell its tale. Look to this well; it will be worth your while, and this portion of your study you will never regret.

Should you introduce figures into your landscape, they must be to the manner born, natural, and also subjected to it. Anybody will not do. It is a frequent fault to include friends who may happen to be with you, irrespective of suitability. I consider this to be deprecated, for, on showing the result, your friends will immediately remark, "Oh, that is Mr. So-and-So," which, after all your hard work, is upon a par of the ignorant gazing upon a beautiful transcript of nature with the only desire of wonder as to its locality.

I ask you to avoid what are generally termed "pretty little bits." I refer to scenery which is hemmed in, and of which multiplicity of detail is the chief feature, for you must remember that form, light, and shade are of more consequence than detail. One does not wish to see every leaf upon the trees or hedgerows, and I consider that the suppression of detail (in reason) is one which will tend to give breadth to our work.

The difficulty which photography has to overcome, from an art standpoint, is that it gives too much, and leaves too little to the imagination; but in this direction there are many workers who are doing their best, and who successfully overcome this, and, as time proceeds, you will see more traversing the same path.

In experience, I have found it a decided disadvantage to go into the field with a preconceived idea as to what one is going to do. You may be looking for that which may not be present, or ever likely to be, and missing those things which lie almost at your feet.

There is one other point, and it is this, viz., to follow, irrespective of your own inclination, the particular kind of subject in which others have achieved success—it will not give you satisfaction. "Learn of all, but lean on none," and in doing so you will feel more satisfied with yourself and with your work, and you will also be laying the foundation for future success.

In conclusion—I trust that I have not wearied you—at the commencement I remarked that it was but little that I had to tell, and that little is not new. You may, perhaps, have wished that I could have dealt with the subject more minutely; had I done so, I think that I should have erred. I might have given you wrong impressions, and, after all, this is a matter upon which individuality must occur. If these remarks are to any purpose, they are written with the idea of asking you to think. I do not put them forward as infallible, for to do so would, in my opinion, violate the principles of what I hope we may all become viz., pictorial photographers, and to limit the means we may employ would be to present a barrier, which would neither be right nor practical. Let us rather try and apply those essentials which Ruskin places as the foundation of art, viz., that which requires the mind, the hand, and the soul of man.

ARTHUR J. GOLDING.

WATER, ITS USE AND ABUSE.

THIS title will possibly induce facetious remarks, varying according to the inner consciousness of the reader. The writer, however, intends it in sober earnest, but solely in its application to photography in both its chemical and physical aspects. The uses of water are so varied and important that volumes might be written without getting much beyond the fringe of the subject. Few photographic processes can be completed without its aid; it enters into the preparation of our emulsions, the development of our negatives, and the washing of our prints, and much of the beauty and permanency of our work depends on the proper application of water.

"Water, and plenty of it," is the photographer's talisman; its use is universal and undeniable, and its abuse is in attempting to make half a pint do the work of a gallon. Negatives and positives alike require the scientific application of this solvent to rid them of all soluble matters whose retention would in all probability sooner or later destroy or injure the image.

The proper washing of gelatine films must be considerably longer than that found necessary with collodion or albumen. Gelatine films on any support vary greatly in the facility with which they part with soluble matters incorporated with them. The penetrability of sensitive gelatine film to water depends on its mode of preparation, without any reference to its sensitiveness, and also determines the length of time required for development. A horny, tough film may be quite as sensitive as a soft and tender one, but will take very much longer to develop, although, as soon as the developer has penetrated the substance of it, the image will rapidly appear; it must also be remembered that, in order to arrest the action of chemicals in such films,

making white and all different coloured lights on the screen. The history of the process showed that Her Majesty's drawing-master, Henry Collen, made the first suggestion in 1865, and was followed by Ransonnet, Ducos du Hauron, Cros, and others, but that their attempts were futile, in that, at that time, there was no method known of making the silver salts sensitive to all colours. Vogel's discovery, in 1873, of a process for this purpose rendered the task much easier. In 1889 Mr. Ives, of Philadelphia, commenced his researches, and, throwing over Brewster's theory of the three primary colours, and adopting Clerk Maxwell's theory of three-colour sensations, was successful in producing lantern slides and prints by three colours, which faithfully reproduced the colours of nature. The practical method of doing this is to make three negatives through various coloured screens, allowing the different coloured rays of the spectrum to act on the plates in definite proportions. From these negatives are made lantern slides, which are projected through glasses corresponding to the three primary colour sensations, and the results are reproductions in all the colours of nature. Mr. Ives, of Philadelphia, who has made the greatest advances in this work, uses a special instrument, called the photochromoscope, which enables the three images to be examined through an eyepiece by daylight, and the results shown in this are superior to that of lantern projection. The formation of white light on the screen was shown by mixing red, green, and violet lights. The most important application of this process—the production of prints—was treated very fully, and it was pointed out that the finest results were to be obtained by means of Woodburytype printing, and that collotype was commercially useless, as it was almost impossible to ensure perfect results, as the balance of coloured inks could not be kept. The method of making process or typographic blocks was then explained, and, after numerous technical data as to the preparation of the coloured screen, the negatives, &c., a large number of specimens, contributed by Messrs. Waterlow, Hare, Weissenberger, the Photo-chrome Company, and others, arranged round the room, were described. Mr. Ives's photo-chromoscope was also shown.

Votes of thanks to the Cordwainers' Company and Mr. Wall concluded the proceedings.

Our Editorial Table.

Orkney, Past and Present.

By J. Foster Palmer, L.R.C.P. London: Thomas Laurie.

In the coming summer there will be, doubtless, experienced a desire by photographers to investigate pastures new, not quite an easy thing to discover nowadays. In *Orkney, Past and Present*, Mr. Palmer introduces to our notice a country situated at a not very remote distance from the mainland of Scotland, but one which differs materially in its manners, customs, and folk lore from those of the mainland. A man born and brought up in the Orkneys knows that this yet little-known country is replete with objects of interest, these belonging, for the most part, to an epoch antedating current times. That there is much of interest in those islands, at one time the habitat of sea kings, pirates, or smugglers—call them by what name you like—cannot be doubted. It is known also that the descendants of these "pirates" aforesaid are severally now to be found occupying foremost places in the parliaments, council halls, pulpits, and even the editorial sanctums of Great Britain and elsewhere. Hence they cannot altogether be ignored. In Mr. Palmer's little work, for it is only a booklet of ninety pages, we find a good deal that gives information as to life and topography in the Orkney Islands. But the author knows, or seems to know, so much more than he at present writes, that we shall hope for a more extended notice of these interesting isles than he has here given. Price 1*s*.

News and Notes.

Affiliation of Photographic Societies.—Meeting of Delegates, Wednesday, May 9, at 50, Great Russell-street, W.C., at eight p.m.

Messrs. Erdmann & Schanz, of 4, Salcott-road, Clapham Junction, write: "We beg leave to inform you that we have been appointed sole agents for the United Kingdom for the sale of Count W. von Gloeden's studies."

Photographic Society of Great Britain.—Ordinary Meeting, May 8, at 20, Great Russell-street, at eight p.m.—*On the Permanence of the Undeveloped Image on Gelatino-bromide Plates*, and *On the Standard Amyl-acetate Lamp and some other Forms of Constant Light*, by Mr. C. H. Bothamley, F.I.C., F.C.S.

Messrs. Cook have issued a programme of their conducted tours to Norway, which is illustrated with a map and a number of photographs prepared by the London Stereoscopic Company, also with pictures of stolkjaeres, carrioles, and other modes of conveyance, and embraces a great variety of tours at inclusive fares from 10*l*. to 140*l*.

Mr. Wilfred Emery, of 24, South-street, Baker-street, W., retoucher, printer, enlarger to the trade, has sent us his price list, from which we observe that he undertakes all kinds of printing, enlarging, finishing, colouring, retouching, &c., at moderate prices. We have had also submitted to us specimens of his work in printing and enlarging, and can pronounce them artistically and technically excellent.

The Cadett Velox Developer.—A few trials made of this developer satisfy us that it is one possessing great energy of action, the details of the image being out before it has been applied many seconds. This is in agreeable contrast with some developers which we used on plates simultaneously exposed. With the plates we were using during the trials we did not discover that any more detail was brought to light by velox than what was obtained by pyro, but the energy with which it acts is a most desirable feature in its favour, especially in the case of under-exposed plates.

A Society for Dunstable.—We have to chronicle the birth, on March 20, of the Dunstable Photographic Society. A few amateurs wishing to advance the study of the art of photography and, at the same time, to promote social intercourse among the brethren of the camera, called a meeting, and were both surprised and gratified to find themselves enthusiastically supported both by professional and would-be photographers. Upwards of twenty members were at once enrolled, who elected as their President Mr. L. C. R. Thring, M.A., Head Master of the Ashton Grammar School. Mr. Worthington G. Smith was chosen Vice-President, Mr. Albert Gutteridge the Treasurer, and Mr. Edward Hare, of the Poplars, Dunstable, the Hon. Secretary. In order that the Society might have a "local habitation" as well as a "name," a house in Anchor-gate has been taken, and a dark room and other conveniences provided for the use of members. At the first Ordinary Meeting, Mr. P. Vlako Turner, an accomplished professional, demonstrated in a most lucid manner how to develop a dry plate, and explained what, to some, is a most mysterious process. By periodical meetings for lectures and discussions, by practical demonstrations, and by an occasional exhibition, it is hoped still further to educate the public taste of Dunstable, and to create an increased interest in photography.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7973.—"Improvements in Colour Photography." J. M. Gillies, R. M. Inglis, E. E. Fournier d'Albi, and W. C. Nixon.—*Dated April*, 1894.

No. 8016.—"Improvements in the Manufacture of Photographic Films and Plates, and in Apparatus for use therein." B. J. Edwards.—*Dated April*, 1894.

No. 8070.—"Improvements in Photographic Hand Cameras." T. H. Algate.—*Dated April*, 1894.

No. 8239.—"An Improvement in connexion with Photographic Camera Shutters." J. F. Parsons.—*Dated April*, 1894.

No. 8406.—"Improvements in or relating to the Production of Divided Negatives or Positives." R. S. Clouston.—*Dated April*, 1894.

No. 8447.—"An Improved Photographic Dark Slide." J. F. Parsons.—*Dated April*, 1894.

PATENTS COMPLETED.

A Method of Making Negatives in Relief, or Sheets of Raised Type, on Tin Foil or Thin Metallic Sheets, by Means of Typewriting Machines, from which Copies can be Printed and Multiplied.

No. 16,173. William Cordeaux, and John Hetherton, both of Exchange Chambers, Clifford-street, York.—*March* 24, 1894.

The object of this invention is to produce negatives in relief, or sheets of raised type, on metallic sheets, by means of type-writing machines, from which negative copies may be printed and multiplied, and this is accomplished by placing in a type-writing machine a metallic sheet of suitable thickness, and of a soft and flexible nature, which may be more particularly described as follows:—

The sheet is composed of a mixture of lead and tin. It may, however, be made of other soft, tough, metallic foil—such as pure tin foil, or very thin copper. If a mixture of lead and tin be employed, we prefer that which is manufactured by H. Erhardt & Co., Walbrook, London, and known in the trade as double-plated foil, the nature and quality of it being such that eight square feet of it make about one pound in weight.

This sheet is placed in the type-writing machine in the following manner:—Between the metallic sheet and the roller, or under surface upon which the paper would rest (if we were type-writing in the usual way), we place one sheet of thick blotting-paper, or one or more sheets of soft paper, or other material. We find one sheet of thick soft blotting-paper answers the purpose, and it is an advantage, though not essential, to have the blotting-paper, or other backing material, damp enough to make the metallic sheet adhere more closely to it than it otherwise would. As all type-writing machines are not constructed alike, it may be necessary to change the position of certain parts, to allow the metallic sheet and backing, which are together thicker than ordinary paper, to be fixed properly in the machine, as, for instance, the ribbon (if any) should be removed, and any cross bars or other parts which would interfere or disturb the metallic sheet should be removed or partly released from their usual position.

Having thus fixed the metallic sheet, backed as above described, we work the type-writing machine in the usual way, and the result is that, when the type strikes the metallic sheet, or when the metallic sheet is forced into contact with the type, an indentation is made in it, and, when the writing is completed and the sheet is removed, we find, on reversing it, that a negative in relief has been produced, that is to say, the metallic sheet has not only

been indented, but the metal has been forced outwards on the reverse side to which it was struck by the type in such a manner that the shape and character of the type stand out in relief just in the same way as a stereotype block taken from ordinary type appears. We have thus produced a negative in relief, or a sheet of raised type, from which copies can be printed.

The copies can be printed and multiplied on a machine which is the subject of a patent, the title of which is "An Improved Method and Apparatus for Printing Copies of Writing, Music, Drawings, and Plans from Negatives in Relief on Tin Foil or Thin Metallic Sheets," No. 18,835, and dated December 24, 1888; letters patent being granted to the above-named William Cordeaux. It is not necessary further to explain the process of printing the copies, as the subject and novelty of this invention consist only in the method of making a stereotype negative substantially in the manner herein described.

The claims are:—1. The method of making negatives in relief, which consists in placing a metallic sheet, such as herein particularly described, or any other like thin metallic sheet, such as described, in a type-writing machine, having first placed the metallic sheet upon a soft or yielding surface, so that the metallic sheet is indented or impressed when struck by, or otherwise brought into contact with, the type of the type-writing machine, and in such a manner as to cause the shape and character of the type to appear in relief on the reverse side of the metallic sheet, substantially as herein described. 2. The method of making negatives in relief, taken as a whole substantially in the manner and for the purpose as herein described.

An Improved Washing Apparatus for Photographic Prints.

No. 8624. William Morrison Simpson, 58, Elphinstone-road, Hastings, Sussex.—*March* 24, 1894.

In constructing my apparatus I use a tank preferably of metal and of rectangular shape.

The prints to be washed are placed on a series of light open-work frames or grids, which lie horizontally in the tank one above another, with sufficient space between each to prevent any damage to the intervening prints. Each grid is attached to a pipe, placed preferably across the middle of the grid from side to side. One end of the pipe is closed, and the other end, which is left open, projects a little beyond the grid. Each pipe is pierced on opposite sides with a number of fine holes, so that, when water under pressure is let into the pipe, it will issue in a number of fine jets parallel to the plane of the grid, and over the surface of the print below. To convey the water to the pipes, I place in the tank a tube in the side of which is a row of holes corresponding in number to the pipes, the distance between the holes being identical with that between the grids. The open ends of the pipes are connected with the holes in the tube by the intermediary of metal rings or washers, each ring having a hole bored through its edge, into which one of the pipes is fixed. The object of this is to allow of any of the grids being turned aside horizontally and independently of the others, so as to facilitate the laying on and taking off of prints. The tube is supported in the tank in an upright position on a rod, and space is left between the rod and the inside of the tube for the flow of water, except at the ends of the tube, which are bushed to fit the rod. The tube, with system of pipes and grids attached, can be raised or lowered on the rod and clamped thereon by a thumbscrew. An inlet is provided for the admission of water to the tube. I provide an overflow to keep the water at the proper level in the tank, and to draw the contaminated water from the bottom thereof. I also provide means to empty the tank, and, if necessary, I place a strainer at the inlet to prevent the fine jet-holes from becoming choked.

Improvements in the Construction of Line Screens for the Production of Half-tones in Photo-printing Processes.

No. 4123. Robert Schorr, 18, Schiller-street, Gera, German Empire.—*March* 31, 1894.

Abstract.

This invention relates to the line screens or nets which are employed in the production of photo-process blocks or typographic printing, and of transfers for lithographic work, and in which the half-tones and gradations of shade of the original are desired to be represented. These line screens or nets are at present produced generally either by taking a negative or photographic print from a plate engraved with suitable single or double cross lines, or by drawing such lines direct with a diamond or point upon a glass plate, which will take the place of the negative.

The line screen or net so produced is placed, in the production of the half-tone picture, in front of the photographic plate upon which the picture is to be taken. Only the spaces between the lines on the sensitised plate are acted upon by the light, and by this means the picture is divided into large and small dots.

The improvements consist in arranging and constructing the lines of the screen or net in such a manner that the dots will be at equal distances from each other. Since these dots are all at exactly equal distances apart, it is impossible for them to approach each other unequally, as is the case with the existing systems, as already herein described. The running together of the dots into lines is thus impossible, because the dots are not produced by lines. The shape of the dots is of no consequence whatever, and they may be indifferently triangular, square, or round, although it may be possible that, in the majority of cases, round dots may be preferred.

As already described, the different gradations of shade of the original picture have to be produced by larger or smaller dots, and as the dots, arranged according to my improved system, are all at equal distances from all their neighbours, they have a wider margin within which to expand without coalescing, and on this ground alone the lights and shades of the original are reproduced with greater certainty and truth than at present.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
7	Camera Club	Smoking Concert.
7	Peterborough	
7	Putney	
7	South London	*Torn with Much Teaching.* A. Horsley Hinton.
7	Stereoscopic Club	
8	Birmingham Photo. Society	
8	Great Britain	*On the Permanence of the Undeveloped Image on Gelatino-bromide Plates and On the Standard Amyl-acetate Lamp, and some other Forms of Constant Light.* C. H. Bothamley, F.I.C., F.C.S.
8	Hackney	Demonstration. Autocopyist Company.
8	Manchester Amateur	
8	Paisley	
8	Rochester	
8	Stockton	
8	West London	Annual Dinner.
9	Leytonstone	
9	Munster	
9	Photographic Club	
9	Southport	
9	Stockport	
10	Birkenhead Photo. Asso.	
10	Camera Club	
10	Cheltenham	
10	Glossop Dale	
10	Hull	
10	Leicester and Leicestershire	
10	London and Provincial	
10	Manchester Photo. Society	
10	Oldham	
11	Bristol and West of England	
11	Cardiff	
11	Central Photographic Club	Hill-Norris Plates. W. Tylar
11	Croydon Microscopical	
11	Halifax Camera Club	
11	Holborn	
11	Ireland	
11	Maidstone	
12	Hull	
12–14	Liverpool Amateur	Excursion to Dovedale. Leader, J. H. Welch.

PHOTOGRAPHIC CLUB.

April 25,—Mr. E. W. Foxlee in the chair.

Mr. F. H. Carter, speaking of film photography, said he had great difficulty in keeping the film under the developer, and advised putting the film after wetting on a piece of glass, after which it could be treated as an ordinary plate.

Mr. Tottem had used the same method, but thought it took too much time.

The Chairman showed a double dark slide by Hare, the shutters of which opened by hinges instead of being drawn. It is made of metal, and the shutters are corrugated to gain stiffness.

Mr. Tottem, speaking of cresco-fylma for stripping film negatives for enlarging, said that he found it stuck the film to the support instead of loosening it, and also reduced it in size. Mr. Tottem also showed and described several hand cameras by the European Blair Company.

Mr. Conrad Beck exhibited and explained the No. 2 Frena, the Frena magnifiers, and a clip arrangement for holding films during development.

In allusion to film photography, Mr. W. H. Barnes said he had exposed plates and films together (the emulsion being the same), with equal results on development. He had also kept them two months before development, the results being again identical. He did not think films were slower than plates if the emulsion were the same in both cases. Recently he had tested films that had been returned from the West Indies, and found that they had not lost sensitiveness; the gelatine had hardened, and development was slower. He advocated holders for developing films, and showed one made of celluloid, which Messrs. B. J. Edwards & Co. were introducing. It is in the form of a film-carrier.

Mr. F. A. Bridge mentioned having kept Frena films for seven months packed with cards between them, and finding that they had not deteriorated.

Hackney Photographic Society.—April 24, Mr. T. H. Smith in the chair—Messrs. Taylor and Fordham gave a demonstration of the *Photo-autocopyist.* This, like many photo-mechanical processes in principle, is based on the action of light on chromatised gelatine, but, unlike most of them, requires no expensive appliances to work it. Sheets of parchment super-coated with gelatine are sensitised in a three per cent. bath of potassium bichromate, squeegeed on glass, and dried. They are then stripped and exposed under a negative. After exposure, the paper is washed until all the chromium salt is extracted. The result is a film of gelatine with the positive picture in relief. To increase the relief, this is then soaked in a solution of glycerine and ammonia, superficially dried, and then stretched on a frame. Lithographic ink is evenly distributed with a roller, and the print is taken in an ordinary copying press. The advantages claimed for this process among others are:—Cheapness, permanence, and the power of producing any tone at will by means of coloured printing ink. The results produced and shown at the meeting were very good.

April, 1894.

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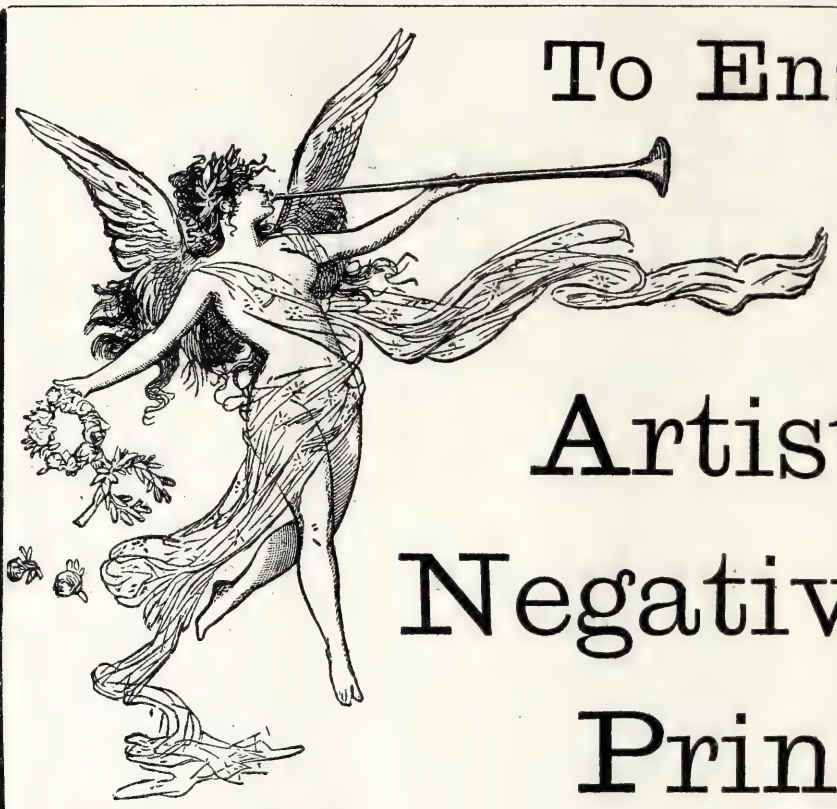
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Leytonstone Camera Club.—April 25, Mr. G. E. Cox in the chair.—Mr. John H. Gear, of the Polytechnic Schools, gave a demonstration on *Bromide Enlarging*. In his opening remarks, he went through the various advantages of the different illuminants used, and recommended daylight as being the best, there being more quality in the result than with the others; it also gave a latitude in using a dodged negative, the doctoring not showing in the enlargement, whereas, with an artificial source of light, every defect and line were apparent; there was also its great claim of economy. He showed, by means of the blackboard, a very easy method of converting an ordinary room for the purpose. The various artificial illuminants were next described; very fair results were to be obtained with merely two oil lamps or gas burners in a tin box if the negative was thin. The claims of the various developers were next explained, he advocating the iron developer, where a black and white, or brilliant, print was aimed at, but he now almostly exclusively used nothing else but amidol, and was very pleased with it, and allowed many after-operations to be successfully carried out, such as toning, &c., which was not the case with iron. He next proceeded to make an enlargement by means of the oxyhydrogen light, which was very successfully accomplished, and the manipulation of local development by means of a wool pad showed the advantages and improvement that this method allows. Printing in skies, &c., were also shown, after which Mr. Gear courted questions upon the subject, but he had dealt with the matter in such a clear and masterly manner there was very little room left for doubt upon any point, it being nearly eleven o'clock before he had finished.

Aintree and District Society of Photographers and Lanternists.—April 20, Mr. W. B. Hellon (President) occupied the chair, the business being the adoption of the rules and arranging list of excursions, after which the last lantern exhibition of the season was given. A large collection of excellent slides, made and lent by the members of the Liverpool Amateur Photographic Society, were passed through the lantern and greatly admired, together with work done by members of the Aintree Society.

Derby Photographic Society.—April 24.—The business of the evening was a demonstration by Mr. A. C. BALDWIN, of the Eastman Photographic Material Company, London. The room on entering looked more like an art gallery than a dining-room, the walls on all sides being tastefully hung with specimens of work done by the Eastman Company. The pictures were simply superb, and shows to what perfection photography has now attained. There were large cameras and small Kodaks, tripods, shutters, &c.; in fact, such a host of apparatus, enough almost to bewilder one. The genial lecturer commenced by describing the Kodaks and other apparatus made since the introduction of the firm; there were really some very ingenious instruments. Passing from this part of the subject, Mr. Baldwin next toned a number of prints on Solio paper, and a little later developed several examples printed by gaslight on the new Platino-bromide and Nikko papers. The formula for working was also given, and those who watched the demonstration carefully could not fail to get successful results.

Liverpool Amateur Photographic Association.—April 26, the President (Mr. A. Tyrer) in the chair.—Five new members were elected. Swinden's new Monarch hand camera was exhibited and explained by Mr. F. V. A. Lloyd. Mr. E. J. BROWNE gave a practical demonstration on developing and toning gelatino-chloride paper by his patent Zenotype process, whereby gold toning is superseded. This he showed to the satisfaction of the members. He also explained how to get the different tones by aid of the acid bath. Mr. J. T. Norman Thomas exhibited some stereoscopic slides (wet-plate process) made by Messrs. Pumphrey Brothers, Birmingham, thirty years ago, which are as good now as then.

THE third excursion of the season was held on Saturday, April 28. The places chosen were Trevor and the Dee Valley. A rather large party, including ladies, left Woodside station about eight a.m. On arriving at Trevor, the members were met by the Leader, Mr. E. Lloyd Edwards, of Trevor, and conducted by him through lovely scenery to "The Tower," a shooting-box of his. After lunch, kindly provided by Mr. Edwards, the journey was continued to Llangollen, many photographs being secured on the way. Over one hundred plates were exposed. Llangollen was reached about five o'clock, where tea was served at the Hand Hotel. There was a good deal of walking and hill-climbing, but the party thoroughly enjoyed themselves, and were sorry to return to Liverpool. They will always remember with pleasure the kindness of Mr. Edwards, and the great trouble he took. Groups were, of course, taken as a memento of the trip.

Kilmarnock Amateur Photographic Society.—A very largely attended meeting of this Society was held in the Oddfellows' Buildings, John Finnie-street, Kilmarnock, on Friday, the 20th inst. Mr. J. MACK WILSON, Prestwick, gave an address on the Use of the Tele-photo Lens, a lens by which distant objects can be photographed, and made to appear as if quite near. Several tele-photo lenses, and photographs taken by this lens were exhibited, having been lent by Mr. J. H. Dallmeyer, London. Mr. A. Riddell, of Glasgow, showed a changing box, which to all appearances will revolutionise the means of exposure of photographic plates. The PRESIDENT (Mr. Ferguson) then gave an address on *Stereoscopic Work*. He showed how a half-plate camera could be easily utilised for taking stereoscopic pictures. Mr. Ferguson also showed a hand stereoscopic camera of his own design and manufacture, and several excellent pictures taken by it. On account of the great interest being taken in photography nowadays, and also on account of the large number from all parts of Ayrshire being desirous to join the Society—the membership having this session risen from twenty till it is now over sixty—it was agreed that in future the Society be called the Kilmarnock and Ayrshire Photographic Society, and that professional photographers be eligible for membership. It was left to the Council, along with Messrs. George Davidson, Glendoon, Ayr; Robert Gudgeon, Netherby, Ayr; and J. Mack Wilson, Prestwick, to revise the rules, and draw up a syllabus of meetings for the summer. The following were admitted members of the Society:—Miss M. Dangerfield, Basskimming, Mauchline; Rev. Joseph Mitchell, Mauchline; Captain Thorneycroft, Ayr; Captain Fines, Ayr; Mr. Allan Muir, Viewfield, Mauchline; Mr. Marcus Bain, Mauchline; Mr. Claud Jackson, Springvale, Ayr; Mr. Wallace Allan, jeweller, Ayr; Mr. Richard Dobbie, Laurel Bank, Ayr; Mr. David Caldwell, Queen's-terrace, Ayr; Mr. J. M. Pearson, civil engineer, Kilmarnock; Mr. Milne, sanitary inspector, Ayr; Mr. J. Lawrie Coulson, Failford, Farbolts; Mr. John R. Walter, 19, Fullarton-street, Kilmarnock; and Mr. Smith, [illegible] box manufacturer, Mauchline. The Secretary of the Society is William Paterson, teacher, 50, St. Andrew's-street, Kilmarnock; or Grammar School, Ayr; and the Treasurer is Mr. James S. Bain, 25, Portland-road, Kilmarnock. The subscription is five shillings per annum.

Photographic Society of Ireland.—April 18, M. Hedley (Vice-President) in the chair.—A lecture, entitled *Stray Shots*, was given by Mr. A. M. Geddis, and comprised about one hundred and seventy lantern slides made from negatives taken on various tours by the lecturer; some pictures interesting to those present were shown being mementoes of society excursions to such places as Glendalough, the Devil's Glen, Drogheda, Monasterbirce, and Rostrevor, besides many views taken by Mr. Geddis at various times in Wales. Plates and films of different makes were used, and nearly all the slides shown were reductions from 5 × 4 and whole-plate negatives made in a reducing camera of Mr. Geddis' own construction. The lecturer preferred daylight reductions to those made with artificial light, for, when the latter were used, in several cases the distances were lost owing to imperfect rendering of values. At the lantern Messrs. Harpane and Bewley officiated.

APRIL 26, Mr. Hedley (Vice-President) in the chair.—The first business of the evening was the distribution by Mr. Hedley (in the absence of the President, Dr. Scott) of the medals to the successful competitors at the Society's last Exhibition, held in January. The following members attended to receive the awards made them:—Enlargements: R. M. Inglis, silver medal; L. R. Strangways, bronze medal. Hand-camera work: J. M. Keogh, silver; R. M. Inglis, bronze. Landscape: R. M. Inglis, silver; A. E. Gordon, bronze. Figure studies: F. H. Orr, bronze. Archæological subjects: H. Goodwillie, bronze. Clouds and marine: J. M. Keogh, silver; R. M. Inglis, bronze. Lantern slides: J. A. C. Ruthven, silver; J. M. Keogh, silver; H. Goodwillie, bronze; Geo. Drury, bronze. After the distribution of medals, Mr. J. A. C. RUTHVEN, the energetic Hon. Secretary of the Society and the Local Hon. Secretary of the Photographic Convention of the United Kingdom, gave a most interesting lecture, entitled the *Hill of Howth—Pictorial and Historical*, and which was illustrated by a great number of excellent slides, both artistically and technically successful. Mr. Ruthven distinctly proved that "Howth" was a good field for pictorial work, a fact which the casual observer was quite unaware of.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

METHYLATED SPIRIT FOR DRYING NEGATIVES.

To the EDITOR.

SIR,—I will supplement Mr. Bolton's experience with methylated spirit for drying negatives by a little of my own. I had used, until lately, pyro-ammonia and pyro-soda developer on Ilford ordinary plates, and dried them with the common methylated spirit obtained from the neighbouring oil shop, which seemed a good, clean sample, with no particularly offensive odour, and of average strength. No damage or abnormal appearance occurred to the negatives up to this week, when a change took place.

The plates used were the rapid plates of another maker, and the developer was metol and soda, the spirit a fresh supply, but exactly similar in appearance and smell to that beforetime used—I fancy that in all probability it was supplied out of the same bulk—let that pass. The negative was perfect as a negative to the time it was put to dry in the sun out of doors, after a bath of spirit for five minutes, the surface moisture being previously removed with a soft cloth. Now the trouble began; dead, dirty-looking smears made their appearance as the plate dried, and, when quite dry, all that portion of the plate that had been longest drying was covered with these markings, not only on the surface, but the film itself was irregular in density, with mottling all over the parts longest moist. The more quickly dried parts were quite free from defects of all kinds. I merely record this experience, as the fault may possibly be due to something other than the methylated spirit.—I am, yours, &c.,

May 1, 1894. EDWARD DUNMORE.

GLYCIN.

To the EDITOR.

SIR,—I note that, in what he says of the new developers, Mr. Pringle says nothing about glycin. I have recently tried a series of experiments with all the newly introduced developers that I could get, reducin not being in commerce, and I found, on the most careful comparison, that glycin was the only one which possessed the power of the old friend pyrogallol. I exposed a series of plates with a minimum exposure, measured by the Bausch and Lomb shutter, on a subject giving a great range of illumination, and found that glycin was the only developer of the new series which had the same power over the very feeble radiation, giving the detail in the deepest shadows quite as clearly as did the pyrogallol.

The image is of the same cold grey tint as that produced by metol, which is an advantage when the development has to be pushed for the shadows, and as a developer the glycin mixes well with metol and hydroquinone. It develops slowly, in which respect it is superior, in my way of thinking, to metol, as it allows the control of the development to a greater degree, and it has no tendency to fog, while it keeps without losing its power, as I find that metol does. The only drawback I have yet discovered in it is that it is very slightly soluble, and therefore is not available in concentration and portability.

Where the exposure is ample, I should prefer pyro or hydroquinone, as they give good printing density more readily and quickly, but for short exposures I think that glycin is likely to do better than anything yet introduced.—I am, yours, &c., W. J. STILLMAN.

Rome, April 25.

PHOTO-MECHANICAL NOTES.

To the EDITOR.

SIR,—With reference to the article in your issue of the 13th inst. by Mr. Gamble, permit me to give a few facts in reply to it. Leaving aside the deprecatory libel directed against wet-collodion workers, wherein he speaks of "the dirty, slipshod, unmethodical workman he has seen in his lair," it seems to me that Mr. Gamble can only have met the gentleman in his black box at the seaside. Any one acquainted with wet-collodion work knows that, under such dirty conditions, it is impossible to make good negatives.

I see also that Mr. Gamble still uses the out-of-date dipping bath for his silver. Nowadays a large flat dish is mostly used which exposes a much greater surface of the bath to evaporation, and thus helps to keep it in order.

But the most glaring statement of all is in the time he gives to produce a negative by the rival processes, viz., thirty-five minutes to each. This time is cutting it very fine for a dry plate, and making it absurdly long for a wet one.

About two months ago, requiring ten negatives in a great hurry, and using two cameras at once, with the wet-collodion process I produced these in ninety minutes. The plates were first French-chalked, edged with indiarubber solution, sensitised, &c., exposed five minutes each, developed, fixed, and washed in that time, and I can call abundant evidence to verify this statement. But perhaps this is hardly a fair test, as the negatives were of only three subjects, much time being saved by not having to focus the cameras for each one; but the other day I tried again, and made five negatives of different subjects in fifty-eight minutes, using one camera. The negatives were made from very flat silver prints, developed with only eight grains of iron, which made it very slow, and, besides this, they were all intensified within the time.

If Mr. Gamble can beat this with dry plates, I am sure we shall be very glad to employ his methods at our works, where we have often to run against time. If he would care to give me a call, I should be most happy to show him the kind of "lair" in which this work is done.—I am, yours, &c., GERALD WETHERMAN,

Enfield. *The Graphotone Company.*

To the EDITOR.

SIR,—I am amused at the ferocious earnestness with which my last batch of "Notes" have been attacked, and, as I do not wish to make the next a vehicle for controversy, you will, I am sure, allow me to say here that your correspondents are evidently engaged in branches of photo-mechanical work different to those I have been engaged in myself, and I had not such branches at all in mind when I wrote my "Notes." They may therefore rest assured that the "slur" is not upon them. "Photo-Mechanical" is now so wide a term that one is apt to overlook its ramifications—into Woodburytype, Autotype, &c.—so that, if these are to be brought in, I willingly admit that my condemnation was too sweeping. But in regard to the "zinco" processes the truth of my remarks is known only too well by the managers of "process" firms. Mr. Whiting will now see that my tabulated statement, which obviously was only roughly approximate, applied solely to the "zinco" processes in which the "screen" was used. As regards Mr. Newton, the only point in his letter I need reply to is that in which he doubts the fact that dry plates are used. If I have in any way the opportunity, I shall be pleased to show him numerous proofs of blocks from dry plates by some leading firms who have had the enterprise to fight against the prevailing prejudice. These examples, I have no hesitation in saying, could not be excelled by wet plate, and I doubt if they could be equalled, even by the most skilful and careful wet-plate operator. Lastly, let me express my thanks to Mr. Charles W. Gamble, whose acquaintance, I regret to say, I have not so far made, for courteously correcting the misapprehension that exists as to our identity.—I am, yours, &c., WM. GAMBLE.

THE SIZES OF CELLULOID FILMS.

To the EDITOR.

SIR,—Your correspondent who wonders at the fact that celluloid films as generally supplied are seldom or never exact in size must not be too severe on the manufacturers.

In connexion with the introduction of the "Frena" camera, we made a careful investigation of the subject, and we have found one way alone of cutting a flexible material to a guaranteed size.

This is by stamping the films out one at a time with a top and bottom die from a sheet slightly larger than the finished size. Knives and cutting machines are useless where great accuracy is required, and experience has shown that it is the only certain method of obtaining an exact size.

All the best playing cards are stamped out one by one in a similar manner to that which we have adopted for "Frena" films.—I am, yours, &c., R. & J. BECK.

68, Cornhill, London, E.C.

THE DIFFERENCE IN PROCESSES OF FILM-MAKING.

To the EDITOR.

SIR,—In a recent paper read before members of the Tunbridge Wells Amateur Photographic Association and published in the photographic press, the author reasons as follows:—

"These various makes* may be divided into 'rollable' and 'cut sheet,' and without going into details as to the various substances used in their manufacture, he might mention that in the case of the former a very thin film of the composition in a fluid state is spread on glass, and as soon as dry is coated with the emulsion. With the cut sheet a solid block of material is produced, and slices of the requisite thickness are cut from it by mechanical means. As there is some little uncertainty as to the action of the various constituents of the celluloid support on the sensitive emulsion, and more particularly that of the camphor used, some advantage is gained for the cut film. By this method a certain amount of time is allowed to elapse, probably some months, before coating for all volatile properties to evaporate, whereas the rollable film, on account of its delicate nature, has to be coated before removal from the glass."

The argument used by the author, as far as he goes, is quite correct, and must in practice prove so; but, as it would be inferred by the language used that all rollable film is made by this process, I feel, in justice to the companies bearing my name and the public as well, "the difference" should be pointed out, as the knowledge of the principle of this process, in which the defects are so apparent, has helped to spread the belief that rollable film cannot be made of as good quality or with as good keeping qualities as cut sheet film. The fact that patent protection for the process by which Blair's film is made has only recently been fully granted in European countries has, until the present, prevented this process being described and the great difference shown.

Without going into the disadvantages which are not apparent in the process described, I will endeavour to explain the principle of the process employed in making "Blair's Film."

It will be easily seen, even to those unacquainted practically with the principle of drying or seasoning any material, that the extraction of moisture or liquid (which is drying—and seasoning is only drying prolonged) is accomplished by air absorbing this moisture.

The condition of the air—*i.e.*, its ability to absorb moisture by being dry—as it is brought in contact with the material, and the frequency with which a fresh supply is brought into this contact, governs the drying or seasoning. In the manufacture of film, one of the important qualities is that it should be flat, or at least as nearly so as possible; it is, therefore, most essential that the base or support which takes the place of glass, be exposed on both sides during the entire process of drying. If allowed to dry more on one side than another, curling will result, while if wound or packed before being fully seasoned, the edges exposed will dry and of course contract, leaving a "bagginess" to the central part which, when once formed, is quite impossible to remove. The sheets from which a large amount of the "cut sheet firm" are made, have the advantages set forth, as the sheets are sliced from the block of celluloid while quite "green" and the drying carried forward by both surfaces being exposed to contact with the air.

The process used in making "Blair's Film" can be briefly outlined as follows:—The base, or the basic film taking the place of glass, is formed by spreading the liquid material on an endless moving surface—for instance, a cylinder—and allowing this material, which is formed into the basic film, to remain on this surface only sufficient time to become solid enough to be handled by the machinery without injury, then stripped and kept in motion over rollers, thus allowing the air to be passed over both surfaces equally until sufficiently seasoned, then carried to the coating machine in the non-actinic department, where the sensitive emulsion is applied, and the completed film is arranged on devices which still expose both sides of the film until the drying of the sensitive emulsion is completed.

Thus it will be seen that, from the time the basic film leaves the moving surface until the completed sensitive film is finally cut into proper widths and lengths, and wound or put in cut sheet packages, the air has constant access to both sides, and the time of seasoning the basic film before coating can be prolonged to any extent desirable by extending the area over which it travels, while, as this process is carried on in compartments used for no other purposes, the temperature within them can be kept at any desired degree of heat, and the air changed by propellors as often as necessary.

* Referring to film.

It is surprising the great difference actual tests have shown in the time required to season by this method, compared with that of drying where no direct current can be brought in contact with the surfaces, even in a well-ventilated room. When the film is hermetically in contact with a non-conductor of heat and air, the difference in time is added to many fold. It will be seen that by this process basic film could be made of any length (even miles), and that the relation of the two processes are similar to that of forming fabrics in frames and that of weaving by modern looms. The "ground glass" surface of Blair's film is not produced by sand blasting the basic film itself, as is generally supposed (which would be not only an expensive but dusty and dangerous process), but by giving the travelling surface on which the film is formed a fine grain surface, which is reproduced on the film, and once prepared goes on giving the impression to miles of film without additional cost, labour, or dirt. As to the keeping qualities of film properly made, and with all damaging properties removed from the base compared with glass plates, everything seems in favour of film, as the chief destroyer of the sensitive coating of emulsion is air—moist air, impure air.

With plates the non-flexibility of the support makes it unsafe to pack the surfaces together, and even when so packed the air is not kept from the surface, while even with cut sheet films it is almost entirely so, the flexibility of the support causing the sheets to be in quite perfect contact. With film in rolls the surfaces are practically hermetically sealed from the air, and a roll of film as wound by the manufacturers, with box and wrapping removed, could be exposed to daylight without its affecting the sensitive surface at the ends of the roll, while but a few wraps of the roll would be found affected by the exposure. The advantages in weight, non-halation, and freedom from breakage, need not, I feel, be argued. Many faulty batches of film have been made, but have they (even comparatively and by the imperfect method) been as numerous as dry plates, or any other of the new processes which have revolutionised the method of making photographs in their early stages? Film photography will be found interesting to watch in its onward march.—I am, yours, &c.,

The European Blair Company, Southampton-street, T. H. Blair.
Holborn, W.C., May 2, 1894.

"AN EVIL THING."

To the Editor.

Sir,—My attention has been called to an extract from a speech of Professor Herkomer's, which appeared in a recent issue of your Journal, to the effect that photogravure is a "very evil thing." It is not quite clear to me from the extract—which is all I have seen of the speech—whether Professor Herkomer, in speaking of photogravure, used the term in a comprehensive sense, including under it not only the particular process of intaglio engraving, to which the title "photogravure" is usually applied, but also the various block processes as well; but, assuming that the intaglio process is the one singled out, it seems to me somewhat narrow of Professor Herkomer to have restricted his remarks to photogravure only, and I should like to point out that *any* art, so long as it is in the hands of the man who is a clever mechanic *merely*, is capable of producing things *evil* in greater or less degree. Take the art of lithography, for instance, and consider for a moment the host of cheap horrors which the clever mechanic has produced by its aid, and then think of what that same process of lithography is capable of in such hands as those of Whistler. And so, with other arts, it would be easy to multiply examples, but a needless trenching on your space to do so.

To return to photogravure. In the hands of a man who is merely a mechanic it will produce results which are mechanical and nothing else, and, if used by such a one as a means of reproducing other men's work, the results probably will be clever photographically, but will be pretty sure to have the *surface* quality *only* which Professor Herkomer animadverts on, in one of his Oxford lectures, as a characteristic of photogravure; but, in the hands of an artist, photogravure is capable of far more than this, and I say, without hesitation, can be made to give results which have most of the best qualities of both mezzotint and aquatint, and the results are fully as capable of modification and alteration as those of either of the processes mentioned. I speak from a practical knowledge, extending over many years, of both mezzotint and aquatint. My acquaintance with photogravure is of more recent date, but I have practised it quite sufficiently to have discovered how great are its possibilities in the hands of an artist who will take the trouble to work the process *himself*. Let Professor Herkomer do this, and I am pretty sure that he would not be long in coming to the conclusion that photogravure was a very *good* thing, instead of the "very evil thing" which he has described to be.—I am, yours, &c.,

Thos. Huson, R.I., R.P.E.
Northcote, Waterloo, near Liverpool, April 27, 1894.

"WHAT'S IN A NAME?

To the Editor.

Sir,—Will you permit a subscriber and reader of your valuable Journal to correct an error in your issue of March 30, 1894, page 199? Commenting upon the strange fancy we in America have for conferring titles, you say: "The *Photographic Times* has bestowed upon Mr. F. E. Ives . . . . the title of 'Professor.'"

In this country we value Mr. Ives so highly, and we agree so heartily with the President of the Photographic Society of Great Britain—Captain Abney—in his appreciation of Mr. Ives's work, that we cordially endorse the view which you imply—that no mere title of courtesy can add to Mr. Ives's honour or reputation. We join with you in repudiating the title.

But, Mr. Editor, the *Photographic Times* did not bestow the title, but merely followed high authority. If you will turn to your file for 1893, you will find that the "professorship" was first bestowed upon Mr. Ives by Mr. G. R. Baker, in the Lantern Supplement of The British Journal of Photography, June 2, 1893. The novelty was commented upon at the time by at least one American journal, the *Photo. Beacon*, July, 1893, quite in the line of your own criticism.—I am, yours, &c.,

Philadelphia, April 13, 1894. Edmund Stirling.

AN EXPLANATION.

To the Editor.

Sir,—In your issue of the 15th inst. appears a letter from Mr. Drury Stowe, complaining of the treatment he has received at the hands of this journal; and, as his statement conveys the impression that he has been unfairly dealt with, may I state the other side of the question? Mr. Drury Stowe wrote offering views of the Howard Memorial, and was told that we should be glad to see them as soon as possible after the unveiling ceremony. Unfortunately, his photographs did not reach me until the second post on the day after I had received others, and, as time is of great importance in the reproduction of these subjects, I, after waiting as long as possible, accepted those first to hand. Had Mr. Stowe sent his photographs as promptly as his rival, I should naturally have given him the preference. I am always glad to consider contributions from photographic correspondents, but to be of use they should reach me at the earliest possible moment after the event which they illustrate.—I am, yours, &c.,

James B. Pinker, *Editor.*
"*Black and White*," 33, *Bouverie-street, London, E.C., April* 30, 1894.

THE LEYTONSTONE CAMERA CLUB AND THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editor.

Sir,—May I call your attention to a misrepresentation appearing in the report of the last meeting of the Delegates of the Affiliated Committee of the Photographic Society of Great Britain. Our President (Dr. W. Pickett Turner) is reported to have said that he could not endorse our letter of complaint as to the working of the Affiliation Scheme; but such is not true, as he supported our letter and elaborated upon the shortcomings, which is not reported. The question was asked as to the delegates' attendances; the reply given or reported is one each. This is also untrue. The question was also asked, How many times the delegates had been called together? The answer given is three in twelve months. This is also, of course, not reported. While fully agreeing that the centralisation of photographic societies is a move in the right direction, moving at the present rate will benefit no one. The answer has been given to our complaint that it is our own fault. This, I contend, is the lamest and poorest excuse that can possibly be offered. If it is understood, and it has not been so until the last meeting, that the delegates have got to work the benefits themselves, then why not form an association for the purpose with the whole of the funds available? and, if such excuse is valid, what has the Photographic Society of Great Britain to do with it?—I am, yours, &c., Albert E. Bailey,
Hon. Secretary Leytonstone Camera Club.

NEWCASTLE EXHIBITION.

To the Editor.

Sir,—Will you kindly permit us to explain, through the medium of your columns, that the three pictures entered by Mr. Andrew Pringle in the *genre* class were marked in error "*Not for competition*," and were, therefore, *not taken into account by the Judges*. We think it only justice, both to Mr. Pringle and the Judges, that this explanation should be made by us.

Another point that requires correction is that the *extra* bronze medal, awarded to Mr. C. F. Dickinson, is for his series of flower studies, not for his street scenes, as catalogued.—We are, yours, &c.,

James Brown, W. P. Brewis, } *Hon. Secs.*
37, *Market-street, Newcastle-on-Tyne, April* 29, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

I will exchange rustic chair and rustic garden-seat for good interior background.—Address, G. V. SIMMONS, Portadown, Ireland.

Splendid whole-plate reversing camera and three slides, for accessories, backgrounds, grass mats, and good rug. Photographs exchanged.—Address, R. W. SIMMONS, Galway.

Wanted stereoscopic hand camera, with lenses complete; exchange enlarging apparatus, seven-inch "Optimus" condenser.—Address, W. SAICH, 2, Rose-lane, Waterford.

Strand Magazine from No. 1 to February, 1894, inclusive, in exchange for Ross's 6×5 rapid symmetrical or safety bicycle.—Address, H. HOULTON, 17, Holy Oak-road, Newington Butts.

A wide-angle half-plate rectilinear, by Ross, splendid lens, exchange for a quarter-plate rapid rectilinear by good maker. Mutual approval.—Address, J. MARTYN, Southwold, Suffolk.

Will exchange pair of capital field glasses (long distance), in splendid condition, in case, for half-plate camera with good lens.—Address, JAMES CAMPBELL, 74, Underbank-terrace, Glasgow.

Will exchange two useful pedestals, plain flatted oil background 8×12 feet, forty-eight pieces of matchboarding six feet long, for half-plate lens and camera.—Address, J. YOUNG, 5, High-street, Whitstable.

Wanted whole-plate or 10×8 camera with two or more dark slides, doesn't matter as to condition, in exchange for pedestal and balustrade, nearly new.—Address, A. JENINS, 20, Friars-street, Oxford.

Will exchange Marion & Co.'s "Radial" hand-camera shutter, cost 12s. 6d., for double dark slide to fit Lancaster's quarter-plate "International" cameras.—Address, FRANK H. FIRTH, 19, Werneth Hall-road, Oldham.

For exchange, a 12×10 Dallmeyer triplet, also a Dallmeyer *carte-de-visite*, both with stops complete and as new. Wanted, cabinet portrait lens, by good maker, about eight-inch focus.—Address, T. J. LLOYD, Earl-street, Coventry.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

John Arnold, Taunton.—*Six photographs of Exmoor Bill playing "Nap."*

Horace Greaves Pike, Lichfield.—*Two photographs of Stratford-on-Avon Registry.*

Emma Wheatley, Penrith.—*Seven photographs of dog, cat, and rabbit in various positions.*

VINDEX.—Received; thanks.

R. D. G.—Thanks; next week.

BOB.—1. See answer to T. Cousin. 2. Yes, so long as it works satisfactorily.

W. B. K.—The Eagle brand of gold chloride is to be obtained from Mr. C. E. Elliott, 36, Jewin-street, E.C.

BLOCK.—The process is collotype. See the last and preceding volumes, where you will find the process outlined.

C. WAGSTAFF asks "if the ground-glass varnish, the formula for which is given in the ALMANAC, requires the plate to be warmed before it is applied?"—No; the varnish must be applied cold.

T. YOUNG.—It is quite impossible to say what your immediate chances as a high-class photographic colourist would be in London at the present time, as that class of work appears to be very much neglected just now. Before relinquishing your present work, we should advise you to write to some of the leading London houses on the prospect of an engagement.

F. CARSONS.—If by rain water you mean that collected from house-tops in London, or other large towns, it is quite unsuitable for photographic purposes. Better by far use ordinary tap water, if distilled is not to hand, even in compounding a silver bath. A few hours' exposure to light, and afterwards filtration, will remedy any ill effects of ordinary tap water.

W. GIRLING says: "I have erected a studio with north light, top and sides; I have covered the top light with *papier minéral*. What are the best coloured blinds for the top and side light, and the best way to arrange them? and what kind of material shall I get?"—If the studio is not a very large one, we advise blinds for the roof and curtains for the side. For the purpose, what is known as blind holland will be suitable; and for colour, blue or light green will be best.

B. N. (Leeds).—The addition of pure benzole is quite a different thing from the mineral spirit which the excise authorities will have added to the present methylated spirit. It would be a great convenience to many others besides yourself if the best kind of benzol could be employed.

C. C. C.—There is no novelty in your idea, and no patent could be sustained for it. We have several times published the method of transforming silver photographs into line drawing, or sketches, by tracing the outlines, &c., and then bleaching the image with bichloride of mercury. Thirty years ago the so-called magic photographs were produced by bleaching the untoned image with bichloride of mercury, and then restoring it with hyposulphite of soda or with ammonia, &c.

A. E. HARRIS.—1. The emulsion will do well for plates, and also for paper if more water and gelatine be used. We must refer you to back volumes or ALMANACS for details of procedure, as space is too limited in this column; or get Abney's work on *Photography with Emulsions*. 2. No, it is not suitable. 3. We believe the paper is not now made. 4. Whether sunlight or diffused light be used will much depend upon the print. The latter is the more generally employed.

T. COUSIN.—1. What you have prepared is not according to the formula as given in the ALMANAC, and the product obtained seems to be different from what it should be. 2. Yes, the ferrous-oxalate developer can be used over again by adding a small quantity of a solution of tartaric acid to it, and then exposing it to sunlight for a day or two. It will prove slower in action than new solution, owing to the accumulation of bromide in it. Most practical workers use new solutions.

DONALD FRASER.—Quite correct; a couple of thicknesses of the canary medium, with a good size fish-tail burner, are perfectly safe with extremely sensitive plates, but with plates treated with eosine or erythrosine the case would be different. Then a ruby light should be used. As the latter light is so painful to you, we should advise you to employ the former for general work, and have a sheet of ruby glass to place in front of the yellow light when using the orthochromatised plates.

CONSTANT READER (Festiniog).—Various designs for studios have appeared in back volumes of the JOURNAL and also in the ALMANACS. But there is nothing better for general work than the ridge-roof or the "lean-to" form, according to the situation. These forms are also the least expensive to build. Seven yards long will be a little too short for a portrait studio for a professional photographer, as it will entail the use of very short-focus lenses when full-length portraits or groups have to be taken.

CARBONIENSIS.—The simplest way to make a six per cent. or any other strength solution of bichromate of potash is to weigh out the salt, tie it up in a piece of muslin, and suspend it in the proper quantity of water. In this way there is no difficulty, such as constant stirring, &c., in making the solution, and there will be no necessity to filter it, as the muslin will keep back all extraneous particles. One drachm of liquor ammoniæ to each ounce of the bichromate is quite sufficient. There is no occasion for the use of ice in the solution when the temperature is as low as it is now.

PHOTER writes: "1. We are about to build a large studio, in the centre of a piece of ground at the back of our new premises, which will be *quite detached* from any other part of the *built* premises. Is there any need to get a permit from a district surveyor for this? 2. Should the studio be built without asking permit, or giving notice, &c., what would be the consequence, if we are in the wrong, in not doing what is stated in 1? 3. If the leaseholder or landlord gives us a permit to erect, &c., can the ground landlord object? Should he feel disposed to do so, has he that power? 4. What is the fee generally charged by a district surveyor for this business?"—In reply: 1. Yes. 2. The erection will have to be removed. 3. All will depend upon the agreement made with the ground landlord. 4. We are not sure, as we think it is different in different districts. We fancy it is usually about fifteen shillings.

KILDARE writes as follows: "When a professional photographer sends work for exhibition and competition, how much of it is he supposed to have executed with his own hands? In the case of enlargements, for instance, is it considered sufficient for him to have arranged and posed the subject, and taken and developed the original negative, leaving all the rest to other hands? or, in the case of lantern slides, to have done the same amount but no more? An opinion on this point would be of interest I think to some of the small men who do the whole of their own work and compete with some of the big men who don't."—This is a very open question. As a matter of fact, pictures are exhibited and medals awarded for them when the exhibitor has done far less in their production than that mentioned by our correspondent. It is a matter that ought to receive more attention at the hands of Judges and promoters of exhibitions than it has hitherto done.

*** Several answers to correspondents, &c., unavoidably held over.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1775. Vol. XLI.—MAY 11, 1894.

MICRO-PHOTO-SCULPTURES.

In what we may term the earlier times of photography the nature, the capabilities, and the possibilities of swollen gelatine were, or seem to have been, better known than they now are, when processes dependent upon gelatine are getting into a groove.

Circumstances some time ago led us into a very delightful application of swollen gelatine, and, in the belief that it is unknown to the great majority of our readers, we shall give such a description of it as will enable them to produce works similar to several which, while writing this, are lying scattered over the editorial table for examination by all interested.

Let us first describe what these photo-sculptures are like, previous to giving such directions as will enable any one to make them. Those immediately before us are in the form of circular slabs of hard plaster of Paris, absolutely flat and smooth in all but an enlarged reproduction of any suitable microscopic object, which stands up in relief from the flat surface, much as does the relievo on a finely struck medal or coin, ours having the advantage in respect of dimensions, for they constitute a circle, with a diameter of three and a half inches. They have a raised border, for the twofold purpose of imparting a neatness of finish to these medallion sculptures and for protecting the delicate markings reproduced so faithfully. The subjects comprise diatoms and other microscopic structures, and insects of various kinds, pleurasigma, fleas, and the like. The process of reproduction in plaster consists in effecting a conversion of the lights and shades of any suitable object, when seen in the microscope by transmitted light, into reliefs and hollows of a vigour sufficient to be apparent to every one.

If the degree of relief required were only a slight one, such as suffices in the making of a plate for process printing, then might it be got by making an ordinary gelatine negative surface dry and applying heat, by which the image would be raised in low relief. But in the present case we want something of a much more pronounced nature than can be obtained by drying with heat.

A good, well-defined negative is presupposed. To obtain this is now happily a work entailing no difficulty whatever, seeing so much has been written concerning photo-micrographs. Some judgment, however, must be imported in the selection of objects, and to a beginner we would suggest an object to be found in nearly every collection, the *pulex irritans*, a well-mounted specimen of which makes a very effective enlargement of about $2\frac{3}{4}$ inches in length. A flea being a large object (from the microscopical point of view) does not entail the necessity for employing a costly instrument in making a negative of it. Inserting the eyepiece end of the microscope (which has been thrown into a horizontal position) into the front of a quarter-plate camera and focussing sharply, an exposure of about half a minute, more or less according to the light, will give a vigorously impressed image capable of being developed into a strong negative. Having obtained a negative, the next operation is to make from it a transparency. This is done by superposition in the usual way of producing lantern slides.

A plate of glass about four inches square, having been made clean and placed in a level position, is coated with bichromatised gelatine. The following proportions are those recommended by the late Mr. Walter B. Woodbury for similar purposes nearly thirty years ago, and having worked much with them we can confirm their excellence :—

Bichromate of potash	20 grains.
Gelatine	$1\frac{1}{2}$ ounce.
Water	4 ounces.

The gelatine is first placed in the water, which in the course of two or three hours will have been absorbed, or nearly so, by it. It is then liquefied by being placed on the kitchen hob until warm, when the bichromate is added. When the glass plate is coated, it must be allowed to remain undisturbed until quite dry. It is then ready for being printed upon.

For the very finest class of subjects it is advisable to strip the gelatine film from the glass in order to take advantage of the fine glossy surface arising from contact with the glass. In this case it is needless to remark that this is the surface which must be next to the *cliché* when placed in the printing frame. The time of exposure varies from two to four or five minutes, according to the power of the light. We may here observe that we have obtained sharp, fine reliefs by printing upon the upper or outside of the bichromatised gelatine coating without removing it from the glass at all. When printed, the film, or plate, is thrown into a vessel of cold water, where it is allowed to remain for two or three minutes, by which time the image will be seen to stand out in bold relief from the smooth polished ground. By the application of blotting-paper the surface moisture is removed, and a cast may be taken from the gelatine relief by any suitable means, plaster of Paris in this case.

This method, so far, is similar to that adopted by Pretsch in his process of photo-galvanic engraving, only he obtained his casting in copper by electrotyping. But in the process now advocated for a special purpose a plaster cast leaves nothing to be desired. If a little common alum is mixed with the plaster, it ensures the easy detachment of the cast from the *cliché*. After having become quite dry, the border may have a finish imparted to it by aid of a turning lathe, and from an original

thus finished hundreds of casts may be obtained, especially if a copper electrotype has been made from the first one, the last being in every respect as sharp and good as the first.

As aids to education in microscopic research these micro-photo sculptures ought to be valuable.

THE COLLODION PROCESS AND ITS WORKERS.

THE comments made a few weeks back by Mr. W. Gamble, in his Photo-mechanical Notes, on the wet-collodion process and its workers, have, as might have been expected, evoked some strong protests against the allegations made therein. On reading Mr. Gamble's strictures on the wet-plate hand, and his being past redemption, owing to his "dirty, slipshod, unmethodical," &c., way, one is naturally inclined to the opinion that his knowledge of him must be rather exceptional—that is, if he refers to the wet-plate operator of the old school. That there were some slovenly manipulators in the old days is perfectly true, but they were exceptions, and their carelessness was always palpable in their work when finished, for then there was no retouching to repair defects in negatives, as is the case at the present time. Hence it was absolutely essential to secure faultless negatives in order to obtain perfect prints, and such could only be secured by extreme neatness and care in all the manipulations. Equal care and cleanliness were also imperative to retain the delicately balanced chemicals in proper working condition.

The very nature of the wet-collodion process, as every one who has read the details of it as given in the recent articles on the subject, if they were not familiar with them before, will at once realise is, that perfect cleanliness is the very foundation of successful results with collodion. That there may be some ground for the charges made is quite probable, because we have frequently heard of late complaints from photo-mechanical workers of the difficulty there is in obtaining the services of really good wet-plate operators, such as used to be general a few years ago. This can easily be conceived if the ranks of wet-plate workers of to-day have been recruited from those of the dry-plate worker.

As a rule, there is considerable difficulty in getting the modern dry-plate operator to fully realise how indispensable, through all the manipulations, is extreme cleanliness in order to get perfect negatives. Little *lâches* in this respect that would be of no effect in the gelatine process would be absolutely fatal with wet collodion; hence there may be a ground for strictures in some instances.

Not long ago, indeed since the present controversy has been going on, a process worker, who, by the way, is an old hand with collodion, remarked to us that he would, for a pupil in wet collodion, prefer one who had no knowledge at all of photography to the majority of modern dry-plate operators, adding, that "the way some of these men work is enough to to make a wet-plate man's hair stand on end."

With regard to the rapidity of production by the two processes, in actual practice it is pretty well recognised that collodion must take the palm, more especially when we come to large sizes. The development, intensification—if necessary—fixing, washing, and drying of a collodion negative is a question of a few minutes only. This cannot be said of dry plates.

As to the question of the suitability of gelatine plates for photo-mechanical work generally, there seems, in the abstract, no reason why they should not answer; but, as a matter of fact in every-day practice, it is found, up to the present tim that for these processes they are not equal to those of collodio Therefore the latter process is used almost exclusively alike this country and on the Continent, and also in America, f every kind of photo-mechanical method.

On the subject of the comparative cost of the two processe labour is an important item in the case. The skilful wet-pla operator commands here as well as abroad a much high salary than does the dry-plate operator. However, the cost the production of the negative, by whatever process it is mad is but a secondary consideration with the highest-class phot mechanical workers; it is the ultimate result that concer them most.

It is not at all surprising that some of the old wet-pla workers, like Mr. Chas. Whiting and others, should criticis the wholesale condemnations made against them on possibl insufficient grounds.

The Dublin Convention.—Mr. Cembrano writes: "I connexion with the Convention Meeting, an exhibition of photograph and photographic apparatus will be held in the Large Hall of th Photographic Society of Ireland, 35, Dawson-street, Dublin, whe all exhibits should be sent, carriage paid and addressed to the Secr tary, on or before July 7. The charges for wall space to membe will be 3*d.* per square foot, to non-members 1*s.* The charges f table or floor space to members will be 6*d.* per square foot, to no members 2*s.*, with a minimum of 5*s.* to non-members."

Volatilisation of Salts during Evaporation.—Th puzzle offered by many instances, as inexplicable as unexpected, i photographic practice, of the presence of spots or stains may possibl be explained by the investigations of Dr. G. H. Bailey, who, in paper recently read before the Chemical Society, has described ho he found, in experiments he had been making, that certain salts the alkali metals were carried off during the process of evaporatio although every precaution had been taken to prevent this occurrin mechanically. In the abstract given no reference is made to th temperature of evaporation; but it is a question of grave possibilitie whether solutions of salts exposed to the air may not gradually im pregnate the air to a slight extent, and so affect the conspicuousl delicate susceptibility of many photographic surfaces.

The Birmingham Society's Photographic Survey—The example set by the members of the Birmingham Photographi Society in making a systematic photographic record of places o interest in the county of Warwick is one worthy of considera tion and imitation by other photographic societies having simila opportunities. The Birmingham men have been at work on this pro ject for three or four years past, and the results of their labours so fa are deposited in the Birmingham Free Library, which contains a larg number of volumes of prints in carbon, bromide, or platinotype, fro negatives of places of historical or archæological interest in th county. The survey is still in progress, and we learn that there is probability of photogravure reproductions of many of the negative being published. Mr. E. C. Middleton and Mr. J. H. Pickard, bot Vice-Presidents of the Society, have been most active in the practica work of the survey.

Astronomical Telescopes *v.* Photographic Lenses—That a photographic lens of ordinary power is capable of consider able use in recording stellar phenomena is undoubted, and there have recently been published some star trails, produced by exposing the camera for a few minutes to particular portion of the heaven and allowing the star images to depict themselves in curved lines o greater or less length, according as they are far from or near to th

ble. But, lest any false impression as to the actual value of this ass of record should be received, we may here quote a paragraph om the recently issued *Annual Report of the Harvard College Obrvatory*. Professor Pickering states that on a photograph of a rtain star, Omega Centauri, Professor Riley counted no fewer than ven thousand stars in a region only thirty seconds square. Now, photographic lens of, say, thirty-six inches focus would be certainly large one, yet the space covered on a plate by such a lens would ily measure about a third of an inch square. Of course, trails ould be unrecognisable on that small space, while, even if it could arranged to keep the camera in motion to follow the star, such a mber would not be approached to the slightest extent.

Revision of Atomic Weights.—Regularly in our ALMANAC, is done in other photographic works of reference, will be found a ble of atomic weights, to which experimenters may refer to find sired combining proportions. Though many of these are whole mbers, a tendency of late has existed to show that the true proortions cannot be stated, except by fractions, and a revision of the blished data governing all these numbers has been undertaken by r. F. W. Clarke, and published in the *Journal of the American hemical Society*. We append the figures he gives for the elements most importance in photographic operations: Bromine, 79·95; lorine, 35·45; gold, 197·3; iodine, 126·85: platinum, 195; oxygen, 3. The last figure will be rather a surprise, for, of late years, one f the most impressive assertions of the text-book has been that the d sixteen of oxygen must give way to a smaller number. However, Mr. Clarke gives that figure, and his dictum is borne out by the test experiments made by Professor Julius Thomsen, of thermohemistry fame, who has just finished a series of observations on his subject. It is not needful here to state anything but his results, nd he emphatically gives—hydrogen being one—oxygen as sixteen, ith a slight possible plus or minus error in the fifth decimal place. Hence it is obvious that calculators, taking this valuation as a basis, ill be saved a world of trouble in their calculations.

Photographic "Enterprise."—A correspondent forwards s a circular which is being issued by a local photographer. Here it s in all its beauty and completeness, for the benefit of those who are nxious to drag professional photography down to the level of catchenny commerce:—"Photography Extraordinary. Your family roup taken free of charge. Would you like a first-class photograph f your family group? If so, I will come to your house any time by ppointment, take the group, no matter how many in number, and do ou six cabinet-size pictures in the very latest style, mounted on the est gold edge mounts, for 4*s.* 6*d.* 'This,' you say, 'is too good to be rue, too cheap to be good.' As the proof of the pudding is in the ating, I will give every one a chance to test the quality of my work ree of charge. Call, or send post card, and I will arrange to come, ake the group, and do you six copies. If they give you satisfaction ou will pay me 4*s.* 6*d.*, if not you will pay me nothing. Just think what this would cost in the ordinary way, and yet I use materials in very respect equal in quality to those used by any other photographer, no matter how high his charges may be. I will also do hree cabinets and one large picture, 12 in. by 10 in. for 7*s.* 6*d.* Cyclists taken in country lanes, splendid pictures guaranteed, six copies 5*s.* 6*d.*, for framing. Your house taken same price as above. Portraits of all kinds six cabinets 4*s.* 6*d.* Other sizes charged in proportion. Things to be remembered:—I come to your house, thereby saving you both time and trouble. No matter how large the group, the price is the same. Don't think your garden or yard is not suitable, very little space is required, and the roughest place, by a little arrangement, can be made suitable. I have had ten years' experience in all kinds of out-door photography. I did 3000 last summer. I will warrant every picture to last a lifetime. I use the best materials only, and will pay 5*l.* to any one who can prove the contrary. All orders for Saturday must reach me not later than Friday morning. Don't forget that I take no money until the work is brought home finished, and if it does not give satisfaction you will be under no obligation to pay."

Monochromatic Light of Definite Wave-length.—There is in photography a great dearth of exact data in regard to the visual actinic extent of any particular monochromatic light whose wave-length is known. This is probably due to the absence of any ready means of obtaining such light in beams of considerable area. This lack of means stands now, however, in the way of being remedied, for in the recently issued number of the *Proceedings of the Royal Society* there is a description of an instrument which will apparently fill the void we speak of. Mr. A. E. Tutton describes therein "An Instrument of Precision for Producing Monochromatic Light of any desired Wave-length." The particular purpose it was designed for is not of interest to photographers, and need not be further alluded to. The instrument itself is stated, by the author of the paper in which it is described, to have been suggested by an apparatus described by Captain Abney in the *Philosophical Magazine*, 1885, vol. xx. p. 172, but it differs from the latter in most of its detail. In principle it consists of two telescopes similar to the mounting of a spectroscope, save that these two telescopes are identical. A large prism is situated between the two which move round a fixed circle graduated and read by a vernier. Specially constructed slits are made, a solar beam is sent by a mirror through one arm, passing through the prism into the other arm. The slit jaws then act like the cross lines of a telescope, and a particular beam may pass from one side to the other by rotating the observing telescope. The fiducial lines of solar spectrum being read and tabulated, it suffices, when any light from an artificial source is passed through the instrument, to adjust the telescope to any recorded reading to obtain the particular space of the spectrum, in other words, the particular light required. It should be noted that the (corrected) telescope lenses are not cemented so as to avoid injury by heat when the source of light is near to the instrument. The monochromatism is of a very high order, means of diffusing the beam are devised, and one of two inches in width is readily obtained.

THE DENSITY OF THE PHOTOGRAPHIC IMAGE.

FOR the last year or two, during my experiments in emulsion work, in toning and fixing silver prints, also in the action of destructive agents which produce the fading of the images, I have been gradually coming to the conclusion that we have been entirely on the wrong track as to the importance that the silver plays in the constitution of the photographic image. I have hesitated to write on the subject, because on many points the conclusions I have come to are opposed to the theories contained in the various text-books on the subject, and, from past experience in such matters, I know what to expect when one starts a new idea.

But, as I see in last week's JOURNAL that at a recent meeting of the London and Provincial Photographic Association reference was made to some of my experiments of several years ago, the results of which I showed at one of the meetings of that Society, perhaps it would be as well to state the outcome of those experiments and the deductions I drew from them. At that time the general opinion of experimentalists was that density depended upon the amount of silver contained in the film, and that the gelatine simply acted as a vehicle to hold the silver salts in suspension, and had no controlling action whatever in regard to the rapidity of the emulsion or in the development of the silver haloids acted upon by light.

Experiments and investigation into the causes of the various results obtained in those experiments soon taught me that in a gelatine emulsion we had a photographic process governed entirely by new laws from the old wet-plate process with acid development. The starting-point of all, viz., the possibility of obtaining a photographic image, taught me that with the dry-plate process some new power had come into action, because silver bromide is reduced by alkaline pyro without any exposure to light; further experiments proved that, if silver bromide were exposed to light for the same length of time as would be sufficient to obtain a photographic image on a dry plate, it would not be reduced with any greater rapidity, or more perfectly, than if it had not been exposed to light at all. I then found that the gelatine was acting as a totally unsuspected factor in the matter, viz., that it was acting as a physical protector over the silver haloid particles embedded in the film, and that it was due to that cause that it was possible to obtain a photographic image with alkaline development.

It was then that I put forward my theory of that mysterious

power of light which we found was so much more rapid in its action upon the silver molecules firmly embedded in the gelatine film than when they are free on the surface of the film, as in the wet plate. As many of your readers know, my theory is, that the light causes a vibration of the silver and bromine atoms, which destroys the protective power of the gelatine and allows the developer to reduce them. There is, however, a greater mystery in connexion with the dry plate, and that is what is known as the reversal of the image. We found that, if the light action was prolonged, the developer lost its power in reducing the silver particles.

It was in connexion with this branch of the subject that I discovered that *density of image does not depend upon the amount of silver in the film*, and it was some of the results of those experiments which I showed at the meeting of the London and Provincial Association Some of the plates that I showed contained less than a grain of silver to the whole plate ($8\frac{1}{2} \times 6\frac{1}{2}$), and I obtained enormous density. Others, prepared under slightly different conditions, from the same samples of chemicals, gave only a ghost of an image, with seven times the amount of silver in the film. The detail was there, but the developer would not produce density. It was not due to reversal of the image through over-exposure; it was simply that the silver was in such a molecular state that, when reduced by the developer, for some reason it had no covering power.

In these days, when hardly any one makes his own plates, it would be of little use to give the results and particulars of the experiments I made at that time, the more so, as then I could not get a grip at all of any laws that would give any explanation for the results that I obtained; but since, during further investigation into the phenomena of reversal, I think I have gained a clue to the reasons for some at least of them.

The conclusions I have come to at present are as follows:—First, That density is not due to the amount of metallic silver that is actually reduced by the developer; or, in other words, that the power of obstructing light is not given by the silver itself, but that, at the moment of its reduction by the developer from its combination with the bromine, it instantly enters into combination with organic matter of the developer or the gelatine, and that density depends upon this organic matter in its combination with the silver rather than upon the amount of silver reduced.

There is no doubt that the power of the silver to absorb or combine with organic matter during its reduction by the developer varies to an extent according to the molecular state of the silver bromide at its formation.

For instance, I have made emulsions each containing the same amount of silver bromide. Plates were coated with equal quantities on each plate. They were dried together, exposed the same length of time, developed in the same dish to a point giving the same amount of detail. From the one emulsion I obtained more density than would be required for any printing process, the other gave little more than the ghost of an image.

The amount of silver actually reduced was possibly the same in each case, but in the one the silver had the power to combine and take down with it organic matter, which in the other case it did not have.

Again, different developers and modifications of the same developer produce variations of density. It is not the amount of silver that is actually reduced, but the organic matter that it enters into combination with, which gives the density and produces the colour of the deposit.

I think it would be much better if experimentalists in development, instead of trying to find new developers, and using them for all subjects, would take, say, one of them, and, by adding various organic substances, endeavour to obtain, with some certainty, various colours of deposit.

For instance, for a subject with strong high lights and dense shadows, the organic matter deposited with the reduced silver would require to be only of little density-giving quality, whereas, in the case of a subject full of half-tone, without any strong high lights, to obtain a good plucky print, the image would require to be of a non-actinic colour, because, comparatively, there had only been a small amount of the silver acted upon by the light, so that what little there was would require an organic substance to combine with, which would give a non-actinic coloured deposit.

I am quite aware that, in the old wet-plate days, organic substances were added to the iron developer to give more density of deposit, but then there was the free silver on the film for them to combine with, and the image was built up upon the silver haloid acted upon by light. But in the experiments I showed at the London and Provincial meeting the image was not built up upon a small basis, but the density was produced during the reduction of the silver bromide particles themselves, and these particles were so marvellously minute that one grain of silver bromide had dispersed itself equally throughout a film of over fifty-five square inches, and yet that amount of silver had power to enter into combination with sufficient organic matter during development to form a deposit greater than would be required for a printing density.

When we consider that plates used to be prepared containing ten times that amount of silver in the film, and yet often only gave ghosts of images, I think I have proved my point, that the density of the deposit does not depend upon the amount of silver reduced to a metallic state in the film.

We now come to the subject of reversal, and here we find a new series of conditions entirely.

On the first exposure of the film to light, I believe we have the vibration of the molecules of silver and bromine, which destroys the protective power of the gelatine, and on pouring on the developer, if the molecular state of the silver bromide particles were right (in other words, if the emulsion was prepared properly), we obtain a dense image in the film; but, if the action of light is continued, the effect of the over-exposure is to loosen the affinity of the bromine for the silver, and the latter is then reduced so rapidly to a metallic state by the developer that it has not time to enter into combination with organic matter to any extent, and, in consequence, we do not obtain density. Then, if the exposure to light is continued to the point of reversal, I believe the bromine is so liberated from the silver that the small amount of developer that really soaks into the film is prevented by the free bromine from acting upon the silver at all, and we thus get the effect of reversal.

That the bromine is liberated from the silver is shown by exposing a plate to daylight, and by pouring water over it one can smell the bromine.

In a future article I propose to go into the subject of the destruction of the density of the photographic image by sulphuretted hydrogen, &c., especially in relation to various methods of toning and fixing.

HERBERT S. STARNES.

REVIEW OF THE THEORY AND USE OF COPPER SALTS IN PHOTOGRAPHY.*

VII.—COPPER SALTS AS REDUCING AGENTS.

FROM what has been said before, it will be easily understood that the intensity of a negative can be reduced to any required extent by converting the silver image into silver chloride by the agency of copper chloride, and removing the silver salt by hyposulphite. The equation,

$$2Ag + 2CuCl_2 = 2AgCl + Cu_2Cl_2,$$

shows that there is also formed some cuprous chloride. Now, both silver chloride and cuprous chloride are soluble in sodium chloride, which can be used, therefore, in the place of hyposulphite to remove these salts from the film. Based upon these reactions is the following formula, given by Spiller. Equal parts are taken of a saturated solution of common salt and a solution containing

Copper sulphate	1 part.
Sodium chloride	2 parts.
Alum	1 part.
Water	10 parts.

The latter solution is filtered, and contains copper chloride, formed by reaction of copper sulphate and sodium chloride. By increasing the proportion of copper sulphate, an increased quantity of chloride is formed, and the action is more energetic.

Precisely similar results may be obtained by the use of copper bromide. The double bromide of ammonia and copper, consisting of $CuBr_2 2NH_4Br 2H_2O$, formed by adding ammonium bromide to copper bromide in these proportions, has been found by De Koninck† to be a most powerful reducing agent. A one-tenth per cent. solution is said to be too rapid in its action upon the photographic image.

The great objection to these methods of reducing intensity is that the process cannot be watched readily, and may be easily carried too far.

VIII.—TONING WITH COPPER SALTS.

When sodium hyposulphite is added to a solution of copper sulphate, a double hyposulphite of sodium and copper is formed, together with sodium sulphate and sodium tetrathionate.

$$11Na_2S_2O_3 + 6CuSO_4 = 2Na_2S_2O_3 3Cu_2S_2O_3 + 6Na_2SO_4 + 3Na_2SO_4 6.$$

This double hyposulphite acts upon silver compounds, *e.g.*, silver

* Concluded from page 280.

† *Bull. Assoc. Belge*, xv., p. 488 (1888).

sulphide, dissolving the silver salt, and depositing the corresponding copper salt in its place, thus:

$$2Na_2S_2O_3\ 3Cu_2S_2O_3+3Ag_2S=2Na_2S_2O_3\ 3Ag_2S_2O_3+3Cu_2S;$$

but it is not clear whether this reaction has been hitherto used as a means of copper toning.

One of the earliest formulæ for a copper toning bath was published in 1859.* It consisted of—

Sodium hyposulphite	4 ounces.
Copper nitrate	160 grains.
Silver nitrate	20 „
Water	8 ounces.

Dr. Stolze has advocated the use of copper salts for procuring warm tones on bromide prints.† The silver image is treated with copper bromide solution, as described in the process for intensification; when bleached and well washed, the image is redeveloped in daylight with eikonogen or other suitable developer. As the image is intensified by this process, and details are brought out which were before invisible, this method seems specially applicable to flat pictures. If too much intensity is produced, the image may be bleached again, and the development repeated until a desirable result is obtained. Bolton has recommended cupric chloride for toning glass positives on ordinary gelatine plates, the resulting image being of an agreeable pink colour.‡

IX.—Conclusion.

Although the part which copper salts have hitherto taken in photography has been comparatively small, the foregoing brief survey abundantly shows the importance which these compounds possess in view of future discoveries. Nièpce's heliograph process, based on the photo-etching of copper plates, and discovered nearly seventy years ago, is still in use, in improved forms, for the production of bank-notes. The remarkable action of Schweitzer's reagent upon cellulose has already been put to important industrial uses, and seems to possess boundless possibilities for the future. The use of copper salts for paper positives has been but imperfectly studied, perhaps on account of the little that is known of the photo-chemistry of many of the copper compounds. With few exceptions, our knowledge of these compounds is confined to the haloid salts, but very little is known of the photo-reduction products of even these substances. It cannot be said that there has been any recent revival of interest in this direction. Photographic discoveries, however, proceed at so rapid a rate, that it can scarcely be predicted where the next advance will be made, or what old and forgotten researches will give the clue to some new and startling results. J. Vincent Elsden.

PHOTOGRAPHY AND ARCHÆOLOGY.

Part I.—The Advantages of Photography as an Auxiliary to the Archæologist.

Archæology, the valuable teachings of which, at no distant date, were too frequently identified with the worthless crudities and fictions of antiquarian speculation, and, if recognised, on this account undervalued, has within living memory exhibited a rapid and remarkable progress, and, in its capacity as an auxiliary to historical research, made contributions to our knowledge of the past which fairly entitle it to a place among the exact sciences.

This advance seems all the more noteworthy when we come to consider the many difficulties with which the infant science has had, and still has, to contend.

Any attempt at accurate reasoning on the materials of former times is serviceable to truth only in so far as it is based on a series of indisputable premises, which, in the form of existing evidences, it is the provice of archæology to collect and to classify. This, indeed, is a truism which would hardly need stating, were it not the case that it is too often overlooked by those who assume the functions of the historian.

Now, in this twofold division of archæology, this separation of the branch which concerns itself only with the collection of the necessary data from the branch which concerns itself only with their classification or logical distribution as parts of a whole, it is the former in which those difficulties which have been already alluded to perpetually manifest themselves.

The evidences on which the study of antiquity must rest are for the most part of an exceedingly perishable nature. Moreover, in all ages there are many and various artificial agencies at work, co-operating with the slower influence of time to bring about the destruction of the memorials which go to form the materials of the archæologist. These adverse influences will be considered in their proper place; but, before entering on the discussion of details, it seems well that a few words should be said as to the merits of photography as an auxiliary to the particular branch of science with which we are now concerned. Archæology has hitherto been slow to avail itself of the advantages which the camera is so well fitted to afford in scientific inquiries.

In astronomy and in anatomy, in botany and in chemistry, in geology and in physics, photography has found a ready recognition, and in particular branches of most of these sciences its services are now regarded as indispensable. It is, therefore, both curious and unaccountable that, of the many applications of photography to systematic knowledge, that one which by the nature of things it is so peculiarly well adapted, should up to the present time have been treated with comparative neglect. It is to be feared that this rejection of an important auxiliary to his labours betrays, if not an unscientific attitude, at least a want of system on the part of the archæologist; but it is certain that, at no distant date, photography will, in inquiries of this character occupy as high a place as that which it now holds in the investigations of the physicist or the astronomer. On the other hand, it may well be that the peculiar advantages of photography in this connexion are neglected on account of their being imperfectly realised by those who are engaged in the study of antiquity.

Let us look at a few of these advantages. There is, first of all, what may be called its *fidelity*. A good photograph, considered merely as a literal representation of something that has an objective existence, will, in most cases, be found to exhibit a decided superiority to a representation of the same subject as delineated by the draughtsman. This superiority consists in the perfection with which the details of the subject are rendered. Some of these details are of such a character as to be quite imperceptible to the eye of the most skilful draughtsman. Others, by reason of their complexity, he is obliged to render in a manner more or less formal, and thus one of the elements of untruth, namely, conventionality, is introduced into the picture.

Now, in archæological inquiries, it often happens that a literal reproduction of these very details which elude the eye of the draughtsman, or of those which he finds himself unable to render in a faithful manner, is absolutely essential to the antiquary's investigations.

In such a case photography will render him that aid which the draughtsman is incapable of affording him, and by its means he will oftentimes be enabled to arrive at important conclusions which otherwise he might have sought in vain.

As an illustration, I will mention one case in which the value of photography as a means of reproducing the most minute details was shown in a rather remarkable manner.

The late Sir James Simpson, in the course of his examination of the Catstone, one of the earliest of the inscribed monuments of Scotland, discovered that one letter of the inscription, visible to several of the antiquaries of the previous century, had completely disappeared. Before concluding his investigations, a photograph was taken of the monument, and, curiously enough, the missing letter, the very position of which even his skilled eye could only guess at, was found to have impressed itself with the utmost distinctness on the sensitive plate.

Then, again, another great advantage of the application of photography to archæological research is the enormous saving in time and in labour which results from the combination.

In order to acquire anything like proficiency in the art of sketching from Nature, a long course of study is required. When this proficiency has been attained, the draughtsman, on attempting to compete with photography on its own ground, will make the mortifying discovery that what he can achieve, perhaps, only after hours of careful labour, the photographer can do equally well, and with comparative ease, in as many seconds. As a mere draughtsman, he may feel disposed to regard this matter in no serious light; but, should he be also an archæologist, he will find it much to his interest to avail himself of the services of the camera. Thus aided, he will have no difficulty in amassing, in the course of a few years, materials, the collection of which might otherwise have occupied the greater portion of his lifetime.

Yet another advantage of photography is the ease with which copies of a picture may be multiplied. The work of the antiquary is thereby greatly facilitated. As an aid to accurate classification, this important feature of the auxiliary art can hardly be over-rated. Mainly on account of this feature, the camera may be said to stand

* *Photographic News*, ii. p. 59.
† *Phot. Nachrichten*, 1891.
‡ The British Journal of Photography, 1894, p. 84.

to archæology in the same close relationship that the press does to knowledge in general.

A fourth advantage of photography—viz., its cheapness—should not be overlooked. This advantage will, of course, be most readily recognised by those archæologists who, through their own incapacity, have found it necessary to secure the services of the draughtsman. Nevertheless, from what has been already said as to the great saving in time which may be effected by the adoption of photography, even those who have a talent for drawing will find it cheaper in the end to avail themselves of its aid.

A fifth advantage, namely, permanence, a quality which nowadays is easily secured by the employment of any of the modern printing processes, should do much to establish photography in the favour of the antiquary, and this more especially if his chief objection to its use be based on the evanescent character of the results produced by the albumen-silver process.

The last advantage of photography that seems to deserve particular notice here is that which, for want of a better name, may be called its *impartiality*. Any one who has given even a superficial attention to the study of archæology must have been struck with astonishment at the extraordinary diversity of opinion existing amongst antiquaries as to facts which, at first sight, would seem too simple to give rise to controversy.

This conflict of opinion has sometimes a ludicrous side. Take, for instance, the case of that celebrated monument, the Newton stone.

This remarkable stone bears an inscription, on which the ingenuity of scholars has been amply exercised. It has already been rendered as Latin, Greek, Hebrew, Phœnician, Sanscrit, Runic, Celtic, Pictish, and Welsh; and as no two of the readings are alike, and all are open to doubt, the origin of the monument remains as much an enigma as before.

Such diversity of opinion can be accounted for only on the hypothesis of that involuntary tendency to bias which is so apt to manifest itself on occasions when the mind is involved in doubt. The particular form in which this bias will exhibit itself will, in a great measure, be influenced by the special studies in which the antiquary has been chiefly engaged.

If one who has given much time to the investigation of Runic antiquities should meet with an inscription of the Newton stone type, the chances are that he will be led to recognise in the unknown characters the letters of the Norse alphabet. A second, who has confined himself to the study of the monuments of the Romano-British period, on being called upon to give his version of the very same inscription, will most probably produce a copy in which the so-called Runes are represented by letters of a debased Roman type. In point of fact, that particular training which each has undergone has disqualified him from forming a perfectly fair and unbiassed judgment, however much he may desire to arrive at a decision favourable to the interests of truth.

Where so much depends not only on the eye, but also on the temperament of the draughtsman, it will be readily granted that, for the purposes of the archæologist, a process like photography, by means of which a perfectly literal reproduction of the object under examination may be obtained, must be infinitely preferable to one which is apt to produce a more or less fanciful rendering of the facts.

Enough, then, on the subject of those particular advantages which render the union of photography and archæology so desirable. If I have seemed to treat of them rather too exhaustively, it is due to the fact that they are not yet estinated at their proper value.

It is my intention to give a short summary of the different branches of the science wherein the services of the camera are most conveniently available; but, before doing so, it seems desirable that I should say something more as to those adverse influences which have been already briefly alluded to in the beginning of this paper.

Our ancient buildings and monuments, a class of memorials both interesting in themselves and of exceeding value as forming the main source of our materials for the study of the past, are in these days too frequently either utterly neglected or (which is still more deplorable) deliberately defaced, and treated with a total disregard for those peculiar characteristics on which their historic interest chiefly depends.

Neglect is answerable for the destruction of a vast number of these early memorials. Many edifices of unique character and great architectural beauty have been permitted to fall into a state of decay so pronounced as to render hopeless any attempt that may now be made for their preservation.

Wilful destruction and neglect too often go hand in hand. The havoc brought about by time and the wear and tear of natural agencies gives the spoiler a specious excuse for the exercise of his odious work, and one of which he is not slow to avail himself. Thus it happens that our ruined abbeys and castles are, as often as not, regarded in the light of mere quarries, whence the neighbouring populace are at liberty to carry off for building purposes as large an amount of material as they are likely to require.

Illustrations of this wanton spoliation are to be found almost everywhere. Take the single case of the ruined monastic edifices of Yorkshire. Of the noble churches which formerly existed at Guisborough and at Easby, at Mount Grace and at Coverham, at Kirkham, Jervaux, and Byland, only fragments are now standing. These remnants in many cases exhibit all the finer qualities of early architecture; and their beauty gives the ecclesiologist a fresh reason for lamenting the fate of the portions which have been swept away by the destroyer's hand. A single lancet-shaped window, which formed a portion of the eastern gable, is all that remains of the ancient priory church at Kirkham. It is an exquisite specimen of thirteenth century art.

Yorkshire has no monopoly in the work of destruction. Everywhere it is the same. Throughout the length and breadth of the three kingdoms, it might well prove a difficult task to find a parish wherein like spoliation has not to a greater or less extent been practised.

But neglect, ignorance, and sordid motives, though answerable for much of the havoc that has been effected, are not the only forces arrayed against the archæologist. To that most hateful of all modern manias, the so-called restoration movement, is directly attributable much of the shameful treatment meted out to our ancient buildings. Volumes might be filled with an account of the atrocities perpetrated under the auspices of this movement. Of the many priceless relics of former times lost to us through the destructive propensities of the "restorer," few have received anything like a careful examination in the interests of archæology.

Under the heading of catastrophes may be fitly included several artificial and natural agencies unfavourable to the survival of our monumental antiquities. Of these the devastations occasioned by fire, on account of their frequency, seem to deserve the first place. The losses to archæology through this cause are by no means inconsiderable. A notable instance is afforded by the recent burning of the Alhambra, and, in our own country, the destruction by fire of historic mansions, together with their contents, is unfortunately only too common an occurrence.

Then, again, we have the catastrophes due to storms, to lightning, to floods, and to other miscellaneous natural agencies, as well as casualties of an altogether exceptional character, of which latter the wreck of the Roman amphitheatre at Pola may stand for an illustration.

Looking, then, at the number of the destructive agencies in operation, their activity, their ubiquity, and the irresistible influence for evil which they exercise, the moral should be sufficiently plain to all who have any feeling of reverence for the memorials of the past.

That which it may be impossible to rescue from the common fate it is nearly always possible to preserve in a pictorial form. Photography furnishes the means by which this may be effected; and, in a second article, I propose to treat of its systematic application to the different branches of archæological study. MATTHEW WILSON.

PHOTOGRAPHY BY LAMPLIGHT.

II.

THERE is a very wide field outside that of portraiture and copying, to which I referred in a previous article, in which the services of a good battery of paraffin lamps are most useful. In many country houses, where gas is not laid on, interior work has often to be accomplished, and perhaps in this branch of photography, as much as any other, lamplight is of the greatest value, for it enables pictures to be taken that would, in many cases, be discarded as unsuited for photography by daylight.

In nine cases out of ten, the chief, in fact the only, difficulty in interior work is the dealing with the direct light from the windows when working by daylight; and what operator is there having any experience of interior work but has experienced the chagrin of not being able to take the view from some particular standpoint most commonly appreciated by the good lady or master of the house, purely on account of some refactory window?

Very few rooms, indeed, will be found that not only look best, but most natural, from the immediate entrance door, for the first impression when entering a room will always be found to be strongest ust

at the doorway, and in nearly every instance this is the view asked for by the proprietor; but how seldom is such possible of execution by daylight, just on account of the position of some window or windows, which are invariably found immediately opposite to the entrance door, thereby necessitating the working up against the light.

Here lamplight comes in to our aid, and permits of photographs being made from positions quite impracticable by daylight. In most ordinary-sized rooms the use of six or eight good paraffin lamps, judiciously placed at sides and over and below the camera, will effect a most perfect method of lighting, and which, notwithstanding that the exposure is made with the blinds down or up after dark, will look quite natural in the finished result. One great advantage of lamps is the facility of so placing them as to avoid false lights or reflections from bright objects in the room. With gas as fixtures it is next to impossible to get good results, because it does not leave the operator any choice of a standpoint from which to take the view.

In many instances, also, certain fittings or articles of furniture are desired to be photographed, such as elaborately carved mantlepieces or bookcases, and such are seldom, if ever, found so situated as to permit of their being photographed by daylight. Here, again, the lamps will be found most useful, in fact they entirely rob interior work of all difficulty of execution.

But it is not only in private houses that they permit of work being done that would otherwise go past the professional. There are hundreds of cases outside house interiors that come within the pale of practical photography simply through their use.

I remember on one occasion being asked if I could photograph an engine situated in a cellar where not a ray of daylight entered. I immediately replied, "Certainly; the simplest thing in the world!" "Well, we have asked three photographers," was the reply, "and they all said it was not possible." When the job was done, with the aid of a dozen lamps, the engineer smiled and said, "It's awfu' easy when ye ken hoo to gang about it."

I have known instances on board ship also, both in the cabin and in the holds of the vessel, that could only be accomplished by lamplight on account of the almost total absence of daylight. Instances have also come to hand where large, full-length paintings, that were fixed to the walls of a public institution, and which it was not convenient to have removed from their position on the walls, were successfully photographed with the aid of a battery of oil lamps. In this case, special platforms had to be erected to do the work, but such need not be a very costly item in the undertaking. In fact, there is no end to the various subjects that are amenable to lamplight working.

In the matter of exposure, an operator must be guided by the experience of his previous working and the nature of the lamps used. As a rule, long exposures are necessary. In my practice I seldom undertake a job that requires less than forty minutes, and frequently run into several hours, according to the class of subject and stop used.

On the other hand, it must not be thought that lamplight will yield perfect results in cases where a very large extent of space has to be dealt with. My experience has shown me that this mode of lighting, although admirably suited to what may be termed small interior work and close subjects, it will not do to overtax the power of the lamps, and expect perfect results from large vaults or other similar kinds of subjects. There seems to be a certain limit or range inside which it is feasible to work with their aid.

Isochromatic plates come to be very useful in this kind of work; in fact, they are indispensable for almost all kinds of photography by artificial light. Where simple copying is concerned, such as black and white subjects, a slow plate should be selected; but for most interior work the fastest plates should be used, and the utmost consideration given to their development. I have known failures to arise by an injudicious amount of pyro being used in the developer. It not unfrequently happens, when photographing interiors, that large masses of white have to be dealt with. A golden rule seems to be to develop all interior work with a very weak developer, and all copying work with a very strong one. At least, in so far as where black and white lines are concerned, the utmost contrast must be obtained, and in the former case the utmost softness with plenty of detail. The latter is only obtained by good lighting, a prolonged exposure, and a careful method of development with a minimum of pyro and ammonia; the latter alkali still holds its own for bringing out detail.

To those workers who have never experienced the pleasure of working with the aid of lamplight, there is a wide field open before them, and but very little practice will be needed to enable them to appreciate the power such lamps place in the hands of a photographer.

T. N. Armstrong.

SLOWER PLATES FOR LONGER EXPOSURES IN LANDSCAPE WORK.

I have just been reading, with much interest, in the number, for March 30, of the Journal, an article on a subject in which I have always felt great interest myself. In the historical introduction, I do not find my impressions and my experience quite in accord with those of Mr. Wilson; but his may be the more correct, since he has probably a large experience outside his own work; whereas, from the beginning, I have only studied and worked in my own quiet way, having very little connexion with anything outside, but within those limits I have studied and observed rather closely.

When I was incidentally led, more than twenty years ago, to take up the subject, I brought to it a certain amount of scientific knowledge, a certain ideal, from other sources, of what a picture should be, and a certain habit of manipulation, and I began to use whatever resources I could find for reading up the subject. I used the wet collodion process, preparing largely the materials myself, and a large number of dry processes, preparing plates and papers, or buying them in the market. My interest was concentrated principally on landscape work, and my efforts directed to finding, or fixing, the conditions necessary to produce the best results. Working, as I was doing, for myself and by myself, I was anxious to find certain standards of work, both to compare with my own and to show me what I had to aim at, and in this search there were several things which struck me very forcibly.

In the first place, I was surprised to find how very few of the professional photographers, at that time occupied for the most part with studio work, could produce a landscape fit to be looked at; how little they understood what really constitutes an artistic landscape, and how ignorant they appeared of the conditions under which such could be produced. When I considered what could be the cause of it, apart from the number who would have entered the profession to practise it merely as a mechanical trade, it appeared to me in general that the apparatus and materials required for the best results in studio work were so far different from those producing the best landscape work, and the conditions under which one has to work in the latter so different (and this is where I find my impressions different from those of Mr. Wilson), that it need not be surprising if, among those who had a proper idea before them, there were only a very limited number who found the means to realise it. I have, packed away somewhere, a certain number of prints, lighted on from time to time, which seemed to me to come very near to that ideal. On the other hand, on some few occasions, when I had an opportunity of looking through considerable numbers offered for sale, produced by men who stood foremost as professional landscape workers, I was surprised to find how very few were satisfactory from an artistic point of view. However, my surprise became less when I considered the inherent difficulties in landscape work, together with the fact that these prints had to be produced commercially at a very moderate price. I might add the further fact that the great public seemed scarcely to have any idea of what constitutes an artistic picture photographically, and were willing to buy them up as reminiscences, if only they were not too dear.

So much for my impressions historically. I come now to the subject which continues to have a practical interest for me, and which I regard much in the same light as Mr. Wilson does himself, although it seems to me that in several important respects, as in the optical appliances and in the materials used there is now a much greater congruity between studio and landscape work than formerly. The same difference remains between the physical conditions, inside and outside, for which, however, the modifications in apparatus can be more easily found or made; but it is very evident, on examining the photographic literature and the numerous catalogues and advertisements that manufacturers of plates and papers have chiefly in view studio photographers and that multitude of hand-camera men that swarm everywhere about the country. I may say also of that not inconsiderable number of others aspiring to landscape photography, who think the more rapid a plate is the nearer it is to perfection. These categories make up the great mass of the customers of the manufacturers and dealers, and it is for such demands that they must chiefly provide. Hence the difficulty for those who have a just appreciation of what is to be aimed at in landscape photography, and the means by which it is to be realised. Hence the utility of such experiments as those with the results of which Mr. Wilson favours us, and which I would invite him to continue, until he can lay down rules and formulæ whose results may be entirely depended upon. He might also consider whether there is any other substance easily applied and procurable that might be substituted for the chlorine water. I am thinking not merely of

landscape photographers, who might do well to provide themselves with slower plates, but also of studio photographers who may require only occasionally to make a landscape picture.

I do not know whether my own experience might be of use to any of the former of these two classes. For the chance of this, I give it such as it is. It may be regarded rather as that of an outsider.

About fifteen years ago, or perhaps a little less, I packed away all my apparatus and materials. Going into the thing rather broadly, as I did, and providing rather largely, I found the packing, unpacking, and arranging for wet and dry-plate work too much with my rather frequent change of locality, often fixed abroad; but in 1888, being for a considerable time in London, I took advantage of this to re-explore the photographic field, and to experiment on plates, &c., with a view to recommencing, and I was surprised to witness what an enormous development the thing had taken since the general recognition of the value of gelatine dry plates, and from how many sources I could obtain, if I wished, what formerly I could have, from a comparative few, rather diligently sought out. However, my apparatus had again to be put away till rather more than two years ago, since when I have continuously given to the subject such time as I could spare, and have set myself to explore all the new resources both in England and on the Continent, where I have for the most part resided, chiefly in reference to landscape work.

In the first period of my work I knew and appreciated the dry gelatine plates, which were introduced to me by Mr. Kennett, with whom I was on very friendly terms, and I used them regularly, comparing them with other dry plates, either as prepared by him, or by myself with the dried pellicle which he so conveniently sold. He told me he was afraid to make them so sensitive as they might be, as photographers so little understood them that they spoilt them. I deliberately chose for my purpose the slower ones. Mr. Kennett very kindly first showed me how to develop one, and from the first that I exposed—on Gordon Calthrop's church in North London—I never had any difficulty with them. In 1888 I made it a special business to seek out the makers of similar slow plates (there were not many of them), and to make trials of these. For the last two years, for the Continent as well as for England, I have been doing the same, although I have not confined my attention to them, but have been dealing also with the more rapid ones under suitable circumstances; and I may therefore say, for the sake of amateurs who may feel the same needs as myself, there is a certain number, although a limited one, of makers of such slow plates, the plates being in general of a high quality. I have tried now nearly all I could find, and have only found one with whose plates I could not, on becoming accustomed to them, make good negatives. I may have found that with some I could do so more readily from the first than with others, but that may be a matter depending on several little circumstances which are rather personal. I have different things in view in much of the work I do, and take a wider range which would not be advisable for the average amateur. I would advise him to confine himself to one brand of plate until he has mastered them. He can afterwards begin to expose sometimes a second plate of another brand on the same subject, and thus institute a comparison between the two.

The amateur may remember that, according to the advertisements and catalogues, the brand of each particular maker is unequalled, far and away the very best in the market; so that, in order to have the best chance of success, he must procure just that plate and no other. There are a few who have the singular modesty to put forward their plates and other goods only as equal to the best—*equally* as good as any other in the market. I may just add, in regard to the brand of plate with which, in my earlier trials, I could not make a good negative, I have reason to think it was capable of furnishing first-class negatives; but, do what I would, I could not keep the film on the plate. I think, perhaps, if I tried it again now, I might find the means of doing so.

W. Washam.

SOME RECENT ADVANCES IN PHOTOGRAPHIC CHEMISTRY.*

Having obtained a pure silver image, it may be found that its density is not suitable. It is well that the density should never be too great, because there is no practically useful method of reducing it that does not alter the gradation. On the other hand, intensification is certain and easy, and does not falsify the gradation, when done in a suitable manner. In papers read before the Photographic Society and the Society of Chemical Industry, I have detailed the chemistry of mercurial intensification, and shown that ferrous oxalate is the only reagent that can be relied upon to follow mercuric chloride. Potassium silver cyanide is not suitable, because the image it gives is not of constant composition, and is not permanent; ammonia is unreliable, because it gives images of complex and varying composition, which cannot reasonably be expected to be permanent; all simple alkalies are out of the question; sodium sulphite gives a pure metallic image, but in smaller quantity than the original image, and often, therefore, gives no intensification effect; sodium hyposulphite also gives an image containing a less weight of metal than the original, and, besides, is likely to give very complicated, unstable images if used sparingly. Ferrous oxalate, on the other hand, is a perfect reagent, leaving every atom of silver in the original image with an atom of mercury added to it.

The most excellent point of this method of intensification is that, so far as I can discover, there is absolutely no loss of even the faintest detail, but a perfect and proportional action throughout. But this very excellence has proved a drawback in the hands of dirty workers, and workers with unclean plates. A silver stain will be intensified as well as the silver image, and must be so if the action is perfect. I know of no failure by this method not due to imperfect washing or other faulty work. But some photographers say they have found alkaline developers, or alkaline developers without the alkali (if the expression will pass), better than ferrous oxalate, and they have recommended these reagents, I am sorry to say, without a knowledge of their action. If they work, as they are stated to do, "cleaner" than ferrous oxalate, that is a pretty sure indication that they are less perfect, unless the only difference is due to the precipitation of the lime in the water when oxalate is used. I have tried many of these solutions, and none of them are reliable. By the use of them, mercury that ought to be in the image is lost, and one cannot tell how much mercury will be so lost, nor from what part of the image it will come. It is hardly conceivable that the mercury lost can come proportionately from every part of the image, and, if the loss is not proportional throughout, the density gradation of the negative is upset.

Sodium sulphite, when applied alone, removes both silver and mercury from the bleached image, but with a developing agent, whether with or without alkali, I have never found any silver in the solution.

Eikonogen alone I found to act very slightly. With sulphite a great deal of mercury was lost. Eikonogen, 12 grains; sodium carbonate, 25 grains; and sodium sulphite, 25 grains, to water, 1 ounce, acted well, but 19 per cent. of the mercury was lost. Metol alone gave no perceptible action. Metol, 2 grains; sodium sulphite, 4 grains, to 1 ounce, acted well, but very much mercury was lost. Metol, 4 grains; sulphite and carbonate, 24 grains each, to 1 ounce, acted well, but 32 per cent. of the mercury was lost. Amidol, 2 grains, and sulphite, 20 grains, to the ounce, worked well, and 10 per cent. of mercury was lost. This appeared hopeful, so I tried amidol, 8, and sulphite, 20, but this was useless, as its effect was very slight indeed within a reasonable time. So I diminished the amidol instead of increasing it, and tried amidol, 1, and sulphite, 20. This worked well, but 42 per cent. of the mercury was lost. On mixing the amidol and sulphite, sulphurous acid is set free. By adding ammonia to the mixture, a blue colour appears when the alkali is in a little excess, and by adding ammonia in quantity, just insufficient to produce this colour, a solution may be prepared that will remain slightly alkaline throughout the reaction. Such a solution acts very energetically, but a very large quantity of mercury was dissolved by it. Pyrogallic acid, 3 grains; sodium sulphite, 8 grains; ammonia, 3 minims, to the ounce, gave a loss of 29 per cent. of the mercury, and the solution was much more coloured than in any other case. Pyrogallic acid with sulphite slightly acidified was no better.

In some cases, as stated above, I have estimated the actual proportion of mercury in the solution, and therefore lost from the image, but these numbers must be taken as only giving a general idea of the amount. In some cases, by prolonging the action a little it would have been increased, and probably in no case would the same loss occur by repeating the experiment.

Thus I am obliged to come to the same conclusion now that I did when I first drew attention to the chemistry of mercurial intensification, namely, that ferrous oxalate is the only satisfactory reagent to follow the application of mercuric chloride. I show an example in which this method of intensification has been carried out on various parts of the same negative, once, twice, three times, and four times, without a suggestion of stain or trouble of any sort. It should be noted that this repeated application of the process is a very severe test of its cleanness when properly carried out. If there had been the slightest false deposit of mercury at any stage, this would have been doubled by the next treatment, and increased to four times and to eight times by successive treatments. Silver would have increased similarly, but to a still greater

* Concluded from page 82

degree. I could show many negatives intensified by this process, but they are similar in appearance to unintensified negatives, and therefore would not be instructive.

There is only one other matter that I will refer to at present, and that but briefly, namely, the getting rid of the hyposulphite from the negative. Experience appears to indicate that, if a negative is of a satisfactory density, the small amount of hyposulphite left in it after from two to four hours' washing does no harm. But, if the negative is to be intensified, any hyposulphite will cause a precipitate of mercury salt, and so give a false deposit. This would, as a rule, matter but little, but for the fact that a gelatine negative is always difficult to wash evenly, and such a false deposit will, therefore, almost always occur in patches. If the gelatine film is of exactly the same thickness throughout, equal washing all over is difficult, but in most plates there are variations in the thickness of the film that make it impossible, unless it is so prolonged as to be practically perfect in the thickest parts. What we want is a reagent that will oxidise the small residue of hyposulphite into sulphate, which is quite inert, without affecting the image or attacking the gelatine. I do not know of any reagent that will do this. Peroxide of hydrogen, as described, appears to be excellent, the general idea being that it produces sodium sulphate and sulphuric acid from the remaining hyposulphite, but this a mistake. It produces no acid, and only about one-third of the sulphur is oxidised to sulphate. By mixing sodium hyposulphite with a large excess of the peroxide, and allowing them to remain together for three days, less than half the sulphur was changed to sulphate, and whatever change had been produced it was of little, if any, use, for the solution still gave a precipitate with mercuric chloride. Peroxide of hydrogen appears, therefore, to be of no avail; but, even it were, it would be a very unsafe reagent in the hands of ordinary photographers, because its strength is very liable to decline. It may in a few months be only one-tenth of its original strength, and a bottle freshly opened, though originally, without doubt, of full strength, may be found to contain only a third of the stated quantity; and these changes lead to no alteration in the appearance of the liquid, and can only be recognised by a direct test. These uncertainties render it of very little use in the hands of those who are unable to estimate its strength. Alum and acids decompose sodium hyposulphite, but a mixture of alum and hydrochloric acid acts very slowly upon a weak solution of it, so slowly that one might be tempted to say that it also was useless. I find, however, that a fairly well-washed negative is made more fit for inteusification by treating it with an acid solution, or an acidified alum solution, and washing again, and I fancy that the improvement is not due merely to the extra washing that it gets. Whatever may be the actual change brought about by this treatment, I find that it is advantageous from a practical point of view, and that it is a desirable precaution to take.

Discussion.

Mr. J. Cadett said he thought what Mr. Chapman Jones had said was mainly correct, though amongst experienced workers there might, perhaps, be some difference of opinion as to the value of colouring matter in a negative. He had heard many photographers say that, for a certain class of negative, they preferred a very yellow image to one in which, practically, no stain could be observed. Mr. Payne Jennings was very fond of yellow negatives, because, practically, the density was better without so much blocking in detail of the high lights from what might be called lateral development. At his request, he once developed a series of duplicate negatives with ferrous oxalate and pyro-ammonia, and compared them, and he was of opinion that the pyro-ammonia were much superior in crispness and brilliancy in the high lights. Of course, if such yellow stain was liable to alter in course of time, that was a disadvantage, but practical men often had to look to the value of the negative at the moment. Of course, this only applied to landscape work. With regard to portraiture, the necessity for the colour of the image to be the same as the grey of the retoucher's pencil was important, and would outweigh any advantage which a yellow image might have in landscape work. If he understood Mr. Jones aright, he said that the density of the image was practically altered by removing the stain, and, from what he had seen of negatives printed, one that had a tendency to be thin on first production would certainly have been thinner in printing if a clearing solution were used. One must distinguish between the colour of the image and the mere stain in the gelatine film. He was quite sure, from his own experience, that Mr. Jones was right in all he said with regard to the stain when attached to the film itself, but when a clearing solution was poured on the negative there was sufficient change of colour to indicate that a reduction in intensity was obtained—at least, he thought so. He agreed with what was said about acid fixing baths; they certainly made the film hard, and presumably made the washing more difficult.

Mr. F. W. Hart said it was many years since he had any practical experience in negative-making; but, with regard to ferrous oxalate, he used that ten or twelve years ago for intensification, and found it of great value, but he did not use it quite in the manner described. He had a number of stained negatives brought him to treat by a gentleman who had been travelling about a good deal, and had not had a very abundant supply of water for washing, and he had endeavoured to intensify them with mercury and other things, the nature of which he did not know. After several experiments, he assumed that the silver was all there which was originally deposited, and he wanted to get rid of all the mercury. He therefore treated the plates with chlorine water, and then exposed them to light, and redeveloped with ferrous oxalate, and thus he got extra intensification; then, after thoroughly washing, intensified again in the ordinary manner with mercury and ammonia. In this way he got the images much clearer and stronger than when they first came into his hands. Passing to the question of clearing negatives, those gentlemen who were practising photography about 1864 must remember that about that time peroxide of hydrogen was introduced for the purpose of removing hyposulphite from paper prints. He had worked out that subject both with peroxide of hydrogen and with hypochlorous acid, and in his parallel experiments he found, as Mr. Jones said, that the peroxide was not to be relied on, but that the hypochlorous acid was. He had continued to use that since 1864, and never had occasion to regret it. It would eliminate hyposulphite from prints and negatives, and was generally useful, if properly prepared, but was dangerous for any one to use hap-hazard; it must be used carefully, and of proper strength. There was no question that it did turn hyposulphite into sulphate, and, if any hyposulphite of silver were formed, that must be converted into chloride of silver.

Mr. J. B. Hannay said chemists had always been shy of using organic compounds as developers, and, speaking generally, ferrous oxalate was the only one which was safe. Most of his photographic experience was in the days of collodion, and even then good washing was essential, but with gelatine, which gave a much thicker film, and had the substances clinging more perfectly to it, perfect washing was much more necessary. All processes of intensification depended on the simple principle that, if you had a metal in process of precipitation, that metal would precipitate wherever there was a similar metal. You therefore coated the image already formed with mercury, and then you had to remove the last traces of hyposulphite. Hydrogen peroxide was known to all chemists to be absolutely imperfect; if you added it to a hyposulphite, oxidation did go on, but in a slower and slower ratio, until it stopped, but that was not the case with hypochlorous acid. No doubt organic compounds, such as amidol and hydroquinone, gave better gradual results than inorganic developers, such as iron salts; they were much more energetic reducers, and the result was generally a good deal better. Alum, it must be remembered, acted as an acid in many chemical reactions, as was seen in the manufacture of ultramarine. On the other hand, alumina was the best mordant known; all alum salts clung most tenaciously to gelatine, or any substance which would hold it, and it might be that it acted in this way in fixing the colouring matter into the plates.

Mr. Chapman Jones, in reply, said he did not assert by any means that no photographers knew anything of chemistry, but there were about 4000 professional photographers in England, and he could not say how many thousand amateurs, and he feared the proportion of them who knew anything about the science on which the art depended was very small. He had no doubt some preferred a yellow image, and he had given a reason for it. A plate poor in silver gave a better image if staining matter was mixed with it, because there was not enough silver to give a good image without it; or, if there was under-exposure, or the plate was not sufficiently developed, the addition of the staining matter gave a denser and better image, so that, if one merely looked at the immediate use of the negative, and only used it for ordinary photographic purposes, there was something to be said in favour of the presence of staining matter. But you could never be sure that such a negative would not change; if you lightened the colour of the staining matter, it was always liable to go back, and the staining matter might fade, so that you could never rely upon it. It was quite possible that Mr. Payne Jennings preferred a negative not strictly true in gradation; he might prefer one which had rather thinner shadows; and, if he had an image of silver and staining matter, and washed away a part of the latter, he would get such a negative. But that was not a scientific way of doing it. Mr. Hart's observations about the action of chlorine water, followed by ferrous oxalate, he could not say much about, except that they were

interesting. The point of his paper was rather to indicate how they could get chemically pure, clean, and reliable negatives. Hypochlorites did, of course, oxidise hyposulphites into sulphates rapidly, but he omited them, because he had made the condition that the substance used for getting rid of the small residue of hyposulphite ought to be such as would not affect either the gelatine or the silver image. The hypochlorites would affect the silver image to a certain extent, and would affect the surface of the film, and the image which lay on the surface probably to a greater extent than the image which lay below, so that the change, if it did not go right through the film, would be partial, and result in a greater proportional effect upon the shadows than upon the lights. A negative which had chloride of silver left in it could hardly be regarded as satisfactory. Hypochlorites, therefore, from his point of view, were not admissible, because it was difficult to prevent them having an erratic action. He could not quite follow what Mr. Hannay said with regard to the action of organic developers. They left a perfectly pure metallic image if you avoided the production of staining matter. Metol solution, or amidol, or eikonogen, for example, properly mixed with sulphite, so as to get no stain, would leave a perfectly pure metallic residue when applied to an image after treatment with mercuric chloride, only you did not get all the mercury left, nor did you get a fixed proportion of the mercury; that was where the difficulty came in. Peroxide of hydrogen acted on the hyposulphites; he was not prepared to say what was produced, but one might say with probable certainty that one-third of the sulphur was oxidised to sulphate, and it appeared that the remainder was changed into a salt of one of the polythionic acids. Experiments on gradation, as produced by various developers, rather pointed to the idea that the gradation was the same in all cases, provided you were sufficiently careful to get regular and perfect images, free from staining matter.

The Chairman (Mr. Francis Cobb), in proposing a vote of thanks to Mr. Jones, said this was a most important paper from a photographic point of view, and they must all agree that the more scientific way was to know when they had a pure silver image on the plate. There was then something definite to work upon. The question of having a yellow stain or brown stain must be left to the judgment of each individual worker; but, if you started with a pure silver image, you could get what you wanted with more certainty than in any other way.

The vote of thanks was carried unanimously, and the meeting adjourned.

CHAPMAN JONES.

PICTURESQUE HEADS.

[American Journal of Photography.]

IT has always been a *beau-idéal* scheme with us that we would some day get up a collection of very picturesque character heads, but, whenever it has come to the point of carrying out our design, a number of obstacles have presented themselves.

In the first place one finds that, amongst their immediate acquaintances, there are few, if any, who have suitable heads for pictures—that is, faces that would pass as anything more than mere likenesses of the individuals themselves, and interesting to themselves and their friends only as such.

The desire of every one, from the child to the aged person, is naturally enough so far to conform in all those personal matters over which they have control to the average of what surrounds them, that the marked peculiarities which give piquancy in a picture are either subdued so far as to be but slightly noticeable, or else entirely lost, and, should nature have dealt so rudely with one or two of our acquaintances as to burden them with certain vagaries of countenance that place them entirely outside the pale of the usual, do we not feel a delicacy about asking them to submit to the vigorous treatment that will put in existence an exaggerated semblance of their peculiarities?

If we look outside of our acquaintances into the very extensive field of the public at large, how are we any better to attain our object of portraying character?

This extended range, it is true, gives us more frequent examples of what we search for, but we are only tantalised by having presented to us the very models that we are looking for to fill our conception, and knowing that there is little or no hope of being able to secure the necessary sittings. Can we stop every old man, with large features and flowing hair and beard, that we meet on the street, and politely introduce ourselves as an enthusiastic amateur photographer who is anxious to make a collection of picturesque heads for an album? Scarcely. In the city car, at the railway station, and on all lines of travel we are sure, more or less frequently, to see our man or woman. But what short of some fairy interposition will give us an acquaintance under such conditions, or a subsequent posing?

The public generally have not the slightest conception of the difficulty experienced by artists in securing picturesque models. So averse are people to being portrayed otherwise than in what is generally considered presentable condition, that even in comparatively remote country places, where we fall in most frequently with the best characters in face and costume, the bare mention of an intention to paint or photograph is certain to set the attention upon combs, and scissors, and Sunday attire, of which there is always sure to be a store in reserve, and to insist upon an omission of such regard to the toilet is sure to result in utter defeat of the ultimate object. One exception we should make perhaps—namely, the tramp. The tramp, however, is out of our category. Picturesqueness is not necessarily depraved ugliness. The picturesqueness that the artist is to seek and portray must be accompanied with a certain amount of grace and dignity. An ill-shapen, poorly developed, and mean-featured individual, with hang-dog countenance, will never make a picture that can be looked upon with other than contempt. Sheer absence from soap and water, and comb and razor, alone will not suffice. There must be in the character just enough intellect, intelligence, and look of manly honesty to enlist our sympathies. We should feel as if we could have some words with the individual, as though he were one with whom we might interchange ideas, and even perhaps with benefit to ourselves.

It is indeed a curious inquiry, into the subtle qualities and influences which constitute the picturesque in its higher sense. Picturesqueness must not be confounded with abject ugliness. We must not plunge into the absolutely commonplace in our search for it, yet in human nature we must not err on the side of too much elevation.

The most true and severe criticism which ever has been, or can be, brought against the Dutch painters is that they often stooped too low in their fondness for the picturesque. It is their touches of vulgar humour and often excessive commonplaceness that robs their grand historical subjects of the dignity and sentiment which they should possess; and with many of their rustic scenes and *genre* pictures, if it were not for the splendid art qualities which they display, they would be beneath notice.

In our efforts, however, to avoid the low and vulgar, we must not run into the error of some of the French painters of the latter part of the past century, and pose men and women suitable to pose as gods and goddesses in rags, and have them performing menial services amongst humble surroundings.

There should always be maintained, as far as possible, a certain consistency, and it should never be lost sight of that true art work ought to aim at some refining and elevating influence, be it even but in a slight degree.

There is really nowhere to be found so much excellent picturesque art as with the English painters. Covering a period of a century back from the present time, they have given us thousands of beautiful examples, in their domestic *genre* subjects, of that nice balance of poetry and sentiment amongst commonplaceness, and sentiment of elevation amidst rusticity, which, combined with fine composition, admirable effects of light and shadow and beautiful colouring, make a crowning success of art. We must say, in passing, that it is a matter of regret with us that for twenty years past there has been a growing neglect of English art, and in this country ending in an absolute ignoring of it. Chiefly through the efforts of the dealers in art, public attention has been turned solely upon Paris art, and all our young painters go there to study. Unfortunately the French display neither beauty nor elevation in their domestic subjects.

We will not mention any of the names of the best English painters of domestic subjects, because there are too many to begin to enumerate them, and to mention three or four would only do injustice to the rest. What have we emanating from France that fills the place of this truly domestic art, which may be hung, unreservedly and unapologetically, in the majority of such homes as are to be found in this country, where reigns the blessing of all that goes with family, and home, and home ties? In such homes there is no place for the sensual, and vulgar, and disagreeable in art.

To return to our subject of character heads, we would recommend that both professional and amateur photographers, but more especially the latter, who are supposed to have more leisure for experimental work, should, whenever opportunity presents, seize upon good picturesque character subjects. The writer has in his possession two facsimiles of drawings, one by Leonardo Da Vinci, the other by Michael Angelo, of exceedingly quaint picturesque character heads, executed with an exact care for every mark and wrinkle that shows how they fairly loved the work, and that even these greatest painters did not consider such subjects beneath them.

In pursuing such work in photography, care should be taken to secure

a lighting that will attain breadth and softness in the lights and shadows, with an abundance of half-tones. A direct harsh lighting and under-exposure always result in failure, not only because it produces hardness but also because the work will have a more commonplace effect than will be given by the broader, softer lighting. In the model look for full flowing hair, not too much combed and frizzed, and large, well-formed expressive features, vivacity of expression.

We see many examples of fine character heads, produced by photography, notably by some of our most talented western photographers. They have attracted much attention at photographic exhibitions, and have received the notice which they deserved. Some of the work has been upon a large scale, but, even when no larger than can be done upon a five-by-seven plate it may, with proper treatment, be made quite attractive enough.

With all those who will say, "What *do* you photograph such ugly old people for?" we have nothing to do. They have not entered the precincts of picturesque art. There are no sermons in rocks and trees, and no histories in countenances for them.

In our illustration to the present number we have endeavoured to convey some idea of what may be considered a suitable head for picturesque portraiture. Of course, much is lost by the process of reproduction. We have called our picture *The Ancient Mariner* because the subject of it followed the sea throughout the active part of his life. He is sprightly and intelligent, and has been highly prized by artists as a model, until increasing years and feebleness have compelled him to seek retirement from the busy stir of city life.

XANTHUS SMITH.

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE Ninth Annual Exhibition of the Birmingham Photographic Society was held last week. It comprised twenty-three classes, five of which were open, and in these fifty-one exhibitors competed, the total number of exhibits being 511. May we again venture to hazard the opinion we have more than once previously given in similar cases, that there were too many classes and too many medals? The Judges were Mr. Paul Lange, Mr. C. Court Cole, and Mr. Richard Keene. The Exhibition was open for four days, and was, we understand, financially successful.

Many societies nowadays, in holding exhibitions, rely for success in a qualitative sense upon the work that figures in the Open Classes, but this in no manner applies to the Birmingham Society's Exhibition, which received little, if any, support in the direction referred to from outside sources. The members themselves contributed a really fine collection of work, which in some respects, notably those of architecture, interiors, Warwickshire scenery and architecture, we have seldom seen beaten. There was some good landscape, *genre*, portrait, and cloud work, and the technique of the display defied reproach. As we had conjectured, with such a practical body of men as our Midland friends, the tenets of the fuzzy school found no favour at all, the consequence being that their Exhibition was agreeably free from those pathetically ludicrous and unsuccessful attempts to imitate artists' effects which Mr. W. F. Yeames, R.A., scathingly ridiculed at the Camera Club Conference the other day.

In Class I. (Landscape, whole-plate and larger) Mr. W. T. Greatbach took the silver medal for a pleasing warm sepia-toned view in Sutton Park, called *Spring*, and a view of *Boddington Village*, by Mr. J. Simkins, and some charming village studies by Mr. J. T. Mousley were honourably mentioned. Mr. W. Topham and Mr. C. J. Fowler had good work in the class.

In Class II. (Landscape, 7×5 and under) a vague study of sea grass, *Where the Sea Breezes Play*, by Mr. W. Heath, took a silver medal, a similar award going to Mr. Greatbach for a rather soft representation of *Chepstow Castle*, under an almost vertical light. We liked Mr. Heath's *By Quiet Streams*, a crisp and clean little river view, and Mr. A. G. Lawson's *Autumn*, an equally nice bit of work.

There were some distinctly clever frames in Class III. (*Genre*), Mr. W. J. Anckorn receiving the silver medal for *Napping*, an old woman asleep in a cottage; he also showed *Music hath Charms* and the *First Knitting Lesson*. Mr. Sershall had a series of three large pictures, representing a monk in successive stages of snuff-taking—*Preparation*, *Realisation*, *Mystification*. We could not quite gather at what his monkship was mystified in the latter picture. Besides his now familiar *Musselburgh Fishwives*, Mr. T. Scotton had sent *Sherington Fishermen*, a group of three artificially posed "all in a row," and *Looking for his Mates*, another fisherman with his hand to his eyes, looking nowhere in particular. You can do better than this, Mr. Scotton. Mr. H. W. Southall's four studies of colliers at work were remarkably clever and successful specimens of this branch of photography, and Mr. Mousley's four cottage studies, with figures carefully introduced, were admirable. Mr. M. H. Chubb showed four female figure studies allegorically treated to typify *Spring*, *Summer*, *Autumn*, *Winter*, photographically good, but otherwise perhaps scarcely quite successful. *The Bargee's Home*, by Mr. Fowler, showed the stern view of a barge, with figures, and the whole was a pleasant unforced study ably rendered. We liked *Patching-up the Old Craft*, two long-shoremen by an old boat, the figure of one looking on being delightfully natural and clever in the pose. Mr. Hall Edwards received honourable mention for a group of persons looking at an artist at work, and deriving therefrom *A Lesson in Art*; he also had an idealised female figure study, *Faith*, and a *Study from the Nude*, both exceedingly refined in treatment.

The silver medal in Class IV. (Architecture, interiors) was awarded to Mr. E. C. Middleton for four interiors (*Castle Bromwich Hall*; *Beauchamp Chapel*, *Warwick*; *Birtsmorton Court*, *&c.*), and they were singled out by the Judges to receive the Champion prize of the Exhibition. The double distinction was well earned, as the pictures were perfect in lighting, exposure, detail, and printing, and, besides, were of obviously difficult subjects. To this class Mr. W. Greatbach (*The Ambulatory, Gloucester Cathedral*), Mr. J. Simkins (an old *Kitchen* interior), Mr. E. Underwood (*Yardley Church*), *Divinity School, Oxford* (a remarkably fine bit of work), Mr. Mousley, Mr. Pickard and others contributed good examples.

In Class V. (Lantern Slides) Mr. Hankins took the silver medal, and Mr. G. Wilkes honourable mention for a series of six. The above five classes were open.

Perhaps the most ambitious attempt in Class VI. (landscape with figure or figures) was Mr. Greatbach's *Squitch Burning*, which would have been more successful if the smoke had not been represented as white paper. Mr. Fowler's large farm view, *Meal-time at the Farm*, was full—rather too full artistically, perhaps—of bucolic life and animation. The remainder of the exhibits in the class were good, but not remarkably so, and the latter remark almost covers Class VII. (instantaneous) in which Mr. C. S. Baynton had a clever and effective view of a tug towing out of harbour a fishing craft. Mr. Southall's shot at a man *Diving* was successful—but classes for instantaneous work are nowadays mere relics of the early gelatine era, and in themselves are not interesting, we fear. Clouds formed the subject of Class VIII., Mr. Mousley winning the silver medal for some stormy-looking sunsets from Malvern Hills; we, however, preferred Mr. E. Underwood's large and exquisite cumulus cloud piece, the horizon line of the picture being left in the print, thus giving a good effect of height. Mr. G. Wilkes showed good cloud studies at Ilfracombe and Hodge Hill, and Mr. M. O. Suffield clouds before the storm at Natal. Of river scenery (Class IX.) Mr. Underwood's charming view *On the Avon*, a well-selected and composed picture, was undoubtedly the best example shown, albeit the clouds were rather too heavy. Mr. Simkins, Mr. Longmore, Mr. Wilkes, and Mr. Fowler were perhaps the best of the remaining competitors. Mr. W. S. Aston's *Study of a Head* won the silver medal in Class XI. It represented an elderly man in a skull cap, and showed surpassing ability in truthful treatment. Mr. Mousley also showed some conscientiously executed head studies of aged subjects, and an excellently pretty portrait of *An English Lady*, and Mr. Greatbach and Mr. Chubb were well represented. On the whole, for purely amateur work, the Birmingham portraiture is as good as any we have seen. Exterior architecture occupied Class XII., and Messrs. Greatbach (*South Porch, Gloucester Cathedral*), E. Underwood (*Views at Oriel and Magdalen Colleges, Oxford*), Mousley (*Salisbury*), were conspicuous by able if not very difficult examples. An admirable enlargement of Mr. Baynton's *Towing out of Harbour* secured him the medal in the next class, Class XIII. (Enlargements).

Nothing very noticeable appeared in the hand-camera class or in that for seascapes, but that for flowers (XVI.) contained some exquisite studies, Mr. W. Smedley Aston in particular being prominent with some wonderfully delicate and faithful work. He took the silver medal for *A Bouquet*. A natural group of boys, *Playing Marbles*, won Mr. R. C. Cartwright the silver medal in the class (XVII.) for the best picture exhibited by a member who had not been a photographer more than two years, and in the class (XVIII.) for members who had never won a prize Mr. A. C. Gilbert was successful with some cottage views. Mr. H. W. Hughes showed some *Underground Scenes in the Black Country* in this and the next class (XIV.), photographs not included in the previous classes, Mr. Southall gaining the medal for a series (*Colliers at Work*). We have only space to mention that in the three survey classes Mr. C. J. Fowler for a view of *Long Compton*, Mr. Mousley for a study of a Warwickshire peasant, *The Shepherd*, and Mr. Greatbach for an interior view of the *Long Gallery, Aston Hall*, took prizes.

In the apparatus section Messrs. Philip Harris & Co., had a useful selection of photographic sundries on view, including their well-known Cytox Hand Camera. Mr. W. Tylar was to the fore with a selection of the many ingenious contrivances for which he is noted; Messrs. Walter Griffiths & Co. had a stand at which their cameras with tubular metal bases were conspicuous; and Mr. Sershall and Mr. Josiah Pumphrey also had stalls of useful adjuncts to photography. The apparatus section appeared to be very popular with the visitors.

Our Editorial Table.

MESSRS. F. W. VEREL & Co., of Cathcart, Glasgow, have sent us samples of their "Runaway" plates and 1894 films. The former on trial appear to have all the good qualities of a rapid plate, while the

films (which, of course, are of the "cut" variety) are of medium rapidity and seem to be prepared with a due regard to the requirements of film-users. They are clean and easy to develop.

Eder's Jahrbuch für 1894.

Halle A. S.; Wilhelm Knapp.

In a well-printed volume of some 500 odd pages, Dr. Eder, by the aid of original and other articles culled from periodical literature, summarises scientific and practical photographic progress during the year 1893. Considerably over thirty illustrations by various methods of reproduction are included in the book, which has many other illustrations in the text. Eder's Jahrbuch is an exceedingly valuable epitome.

From the Société d'Editions Scientifiques, 4, Rue Antoine-Dubois, Paris, we have received Causeries sur la Photographie, by L. Tisserand (an elementary volume, suited to beginners in photography); Calendrier Civil, for 1894; La Galvanoplastre, by Coffignier; and Cours Théorique et Pratique de Photographie, by Professor A. Soret. This volume deals with the formation of the latent image and its development. The initial section of the book, which treats of the nature of light and photographic optics, appears to be marked by sound knowledge of the subject. The same publishers also send us La Photographie en Voyage et en Excursion, and Utilisation des Vieux Négatifs et Plaques Voilées, by M. Niewenglowski, two brochures the substance of which is sufficiently indicated by their titles. Verily, of the making of photographic books among our Continental friends there is no end.

THE LATE MR. W. H. DAVIES.

We are sorry to announce the death of Mr. W. H. Davies, of Edinburgh. This event took place at his residence on the 30th ult. Mr. Davies had long been associated with photography, and at one time distinguished himself by his papers and writings on its application to artistic work. Our earlier volumes contain articles by him on such subjects as the canons of composition applied to photography, and are still valuable for reference. In early life he was a member of a well-known firm of dealers in paintings and similar art productions, and contributed critical articles on art exhibitions to one of the leading Edinburgh newspapers. He was, up to his death, an occasional contributor to this Journal and its Almanac, and was one of the founders of the Edinburgh Photographic Society.

News and Notes.

Messrs. G. Wright & Co., of Hopwood, Manchester, inform us that Messrs. Percy Lund & Co. have been appointed their wholesale agents for London and the provinces for their specialities—Una, Thiotone, &c. A full stock is kept at both their London and Bradford warehouses.

Photographic Society's Exhibition.—The members of the Photographic Society of Great Britain have appointed the following gentlemen to act as Judges at the forthcoming Exhibition of the Society:—Art Judges: Mr. F. P. Cembrano, jun., Colonel J. Gale, Messrs. Seymour Lucas, F. M. Sutcliffe, B. Gay Wilkinson. Technical Judges: Captain Abney, Messrs. Andrew Pringle, J. W. Swan.

Trade Changes.—Mr. Elisha Mander, of Branston-street, Birmingham, writes: "It is now nearly fifty years since I began to manufacture and deal in photographic goods. In resigning my position as senior partner in the firm of Elisha Mander & Son, I offer to all those friends who have contributed to the prosperity of the firm, and who still survive, my hearty thanks, and venture to express the hope that the kindness will be extended to my son." Mr. Richard Mander carries on the business under the same style as hitherto.

The following are the officers of the Madras Amateur Photographic Society for 1893–4:—*Patrons:* H. E. the Right Hon. Lord Wenlock, G.C.I.E., the Hon. Maharajah of Vizianagaram, G.C.I.E.—*President:* Mr. C. Michie-Smith, B.Sc., F.R.S.E.—*Vice Presidents:* Mr. C. Slater, Surgeon Lieut.-Colonel S. L. Dobie, I.M.D.—*Committee:* Messrs. F. Dunsterville, W. M. Gerrard, V. G. Lynn, A. L. H. Palmer, J. L. Walker, M.A., Captain A. D. G. Shelley, R. E. —*Secretary and Treasurer:* Surgeon-Major J. L. Vangeyzel, M.B., F.I.C., Egmore, Madras.

The Sun and Shade Camera Company, of 40, Tachbrook-street, Pimlico, has submitted to us specimens of new landscape cameras which they are introducing. The "Dreadnought" half-plate weighs only two and a half pounds, and has every useful movement, the bellows being of slightly conical form. The "Fearnought" is a cheaper variety, but is well and effectively designed. The "Pearl," the quarter-plate of which weighs only thirty-six ounces, is of Kinnear form, and combines great portability with completeness of effective movements. All the cameras exhibit high finish of workmanship, are well and strongly made, and should command great popularity among the clients of this new and enterprising young firm.

A Society for Northwich.—A Photographic Society has been formed for Northwich and district. At the inaugural meeting upwards of forty members were enrolled. Though not yet definitely settled, it is intended to have permanent rooms fitted with dark room, which it is intended to place at the disposal of members of other societies and unattached amateurs on tour. At the second meeting a lecture on various phases of photography, illustrated by a large number of fine lantern views, was given by Mr. W. I. Chadwick, of Manchester. There was a large attendance of members and friends. The President is Dr. H. J. Liebstein. Vice-Presidents are Mr. J. J. Dixon and Dr. A. H. Marsh, and Mr. E. T. Ward Hon. Secretary and Treasurer.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
14	Croydon Microscopical	Excursion: Homewood and Leith Hill to Dorking.
14	Hackney	Excursion to Burnham Beeches. Leader, T. H. Smith.
14	North Middlesex	Whit-Monday Outing.
14	South London	Excursion: Bedford. Leader, Wm. Rice.
15	Birmingham Photo. Society	
15	Brixton and Clapham	Prize Slides.
15	Hackney	Demonstration: *Mezzotype Paper.* Chas. F. Robinson.
15	Hastings and St. Leonards	
15	North London	
15	Paisley	
15	West London	
16	Brechin	
16	Bury	
16	Croydon Camera Club	Rummage Sale of Photographic and other Articles.
16	Leytonstone	
16	Manchester Camera Club	
16	Photographic Club	*Isochromatic Photography.* W. H. Barnes.
16	Southport	
16	Southsea	
17	Birmingham Photo. Society	
17	Camera Club	
17	Glossop Dale	
17	Hull	
17	London and Provincial	
17	Oldham	
17	Oxford Photo. Society	
18	Cardiff	
18	Central Photographic Club	
18	Croydon Microscopical	
18	Holborn	
18	Leamington	
18	Maidstone	
18	North Kent	
19	Ashton-under-Lyne	Excursion: Ripon for Fauntains Abbey. Leader, Samuel Woolley.
19	Croydon Camera Club	Seventh Excursion leaves East Croydon at 2.46 for Merstham.
19	Hackney	Excursion to Eynsford. Leader, W. L. Barker.
19	Hull	
19	Leytonstone	Excursion: Hampton Court Palace, the Park, and River. Ldr., G. H. Crooks.
19	Woodford	*Dark Room and Appliances.* E. B. Caird.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

May 8,—Ordinary Meeting, the President (Sir H. Trueman Wood) in the chair.

Messrs. G. T. Harris, H. L. Churchill, J. Bulbeck, E. H. Fitch, and J. W. Wharton were elected members.

It was announced that the Council had appointed a Committee to inquire into the methods of determining the speed of plates.

Permanence of the Undeveloped Image.

Mr. C. H. Bothamley detailed some experiments in the development of plates between two and three years after exposure. They were exposed in 1890–1, and not developed till 1893. Some were packed back to face, others film to film, wrapped in white tissue and brown paper, kept in a reasonably dry place, away from the products of the combustion of gas. The negatives were developed by means of pyro, sulphite, ammonia, and ammonium bromide. The time of appearance of the image and the other phenomena of development did not differ from those with plates developed immediately after exposure. There was no tendency to frilling, and there was apparently no difference in result from what might have been expected from plates not kept for long between exposure and development. Three different makes of plates were used. He thought the conclusion was that, in a properly prepared plate, the latent image was, to all intents and purposes, permanent. In two cases part of the image had apparently disappeared. He suggested that this was due to the fact that no image had really been formed there, those parts of the plate

having been insensitive. Others of the plates had insensitive bands at the edges, which he suggested was due to capillarity of salts in the film, the washing not having been thorough. The permanence of the latent image indicated that the change produced by light was a chemical change.

The PRESIDENT thought it would be worth the while of somebody to undertake a similar series of experiments, developing some plates immediately after exposure, and leaving others to the care of one's executors, administrators, and assigns.

Mr. W. ENGLAND disagreed with Mr. Bothamley's suggestion that the drying marks appeared on the cut centres (quarter-plates being cut down from whole-plates). He thought they would appear on the outside edges.

Mr. A. COWAN, however, favoured Mr. Bothamley's idea.

Mr. A. PRINGLE suggested that the markings would be caused if the plates were allowed to remain too long before being put upright to dry.

Mr. SEBASTIAN DAVIS said the markings were sometimes caused by hand coating.

After other discussion on this point,

Mr. CHAPMAN JONES said he thought the markings were due to capillarity and defective coating, as the image could not be seen through the back of the plate. He did not think the permanence of the undeveloped image was any evidence of a chemical as opposed to a physical change.

Mr. J. SPILLER had made similar experiments to Mr. Bothamley's at an interval of a year. In the 1884 Exhibition of the Photographic Society of Great Britain was a photograph by Mr. G. Berwick from a negative which had been exposed four years previously.

Mr. J. CADETT thought that drying lines would cause the marks, but much depended on the conditions of coating. Time of setting, however, in his opinion, had nothing to do with the question. He had actually seen the crystallised markings in some plates. The atmosphere in which the plates were dried had a great influence. He also thought the foggy appearance of negatives was sometimes due to keeping plates between exposure and development. He had measured the sensitiveness of a thin part of a coated plate, and found it less than that of the other parts.

Mr. T. C. HEPWORTH thought that possibly the insensitive patches were caused by unevenness of the glass.

A vote of thanks was passed to Mr. Bothamley, who, during the paper, showed the original negatives in the lantern, from which it appeared that the negatives were not deficient in density and detail.

Mr. C. H. BOTHAMLEY then gave a discourse on the standard amyl-acetate lamp, and some other forms of constant light. He exhibited an amyl-acetate lamp, with certain modifications of his own introduction, chief of which was the substitution of pure silver for copper, the acetate reacting on the latter. He also stated that constant lights for photographic purposes could be obtained by screening off the lights of gas burners, and argand lamps, and admitting the central parts of the flames through slits.

A discussion followed, in which Mr. Cadett and Mr. W. Grafton took part, the former gentleman owning his indebtedness to the amyl-acetate lamp for photometric purposes, and the latter criticising its practical value in some respects.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 3,—Mr. A. J. Brown in the chair.

SILVER IN COMMERCIAL DRY PLATES.

Adverse comment was made on the action of the photographic journals in not publishing the table of results on Messrs. Haddon and Grundy's paper on *Silver in Commercial Dry Plates* read at a previous meeting. It was proposed by Mr. C. H. COOKE, and seconded by Mr. J. E. HODD, "That the paper by Messrs. Haddon and Grundy on *Silver in Commercial Dry Plates*, read at the London and Provincial Photographic Association on April 19, be printed in its entirety, circulated among the members, and copies sent to all the other Societies." The resolution was carried, as was also one to the effect that the expense of printing and postage be borne by the Association.

Speaking as to the results obtained (as given in the paper read), Mr. HADDON said that one plate-maker had supplied him with data from which could be calculated the amount of silver on a quarter-plate of a particular brand included in the table of results. On working it out, assuming that so many plates were uniformly coated, and that not a particle was lost during the washing, and that none of the silver had subsided, the difference between what ought to have been on the plate and what actually was, was only nine one-hundredths of a grain. The slight loss was in the manufacture.

Mr. Hodd showed several negatives with large markings, having apparently greater density of deposit than the rest of the negative, which he thought were drying marks.

The Chairman and others concurred in the latter view ; but, after some considerable conversation, the general opinion appeared to be that the markings were caused by heat having been employed in drying the negatives.

Mr. Hodd promised to bring up some unexposed plates of the same batch for experiment at the next meeting.

After other discussion, the proceedings closed.

PHOTOGRAPHIC CLUB.

MAY 2,—Mr. Frank Haes in the chair.

The subject of a "Bank Holiday outing" was raised by Mr. BRIDGE. Two or three likely spots were suggested, but eventually the said subject "went by the board."

Mr. R. P. Drage showed, by the kindness of Mr. Freshwater, some photographs taken by Mr. Newton, from Darjeeling, of distant mountains, with a tele-photo lens.

EXPOSURE METERS AND ACTINOMETERS.

Mr. ALEX. COWAN opened the subject by lucidly explaining Hurter & Driffield's. He said he had had a short experience of photography without the use of such instruments, but now he always consulted his friend.

Mr. FRANK HAES showed Deconduns', Stanley's, Sawyer's (Autotype Company) instruments. He also had a Hurter & Driffield. Asked by Mr. COWAN which was his "friend," Mr. Haes said he considered the former were more or less museum instruments, but the latter was a friend.

The HON. SECRETARY showed and described Watkins' exposure meter, the Ilford exposure meter, and Wynne's "Infallible."

Mr. THOMAS BEDDING said that, seeing Mr. Dunmore present, he would like to ask him a question on a matter which had troubled him since Mr. Dunmore's last visit. It was with regard to spectacle lenses and the aperture which Mr. Dunmore had employed in taking some views shown at a previous meeting. He understood Mr. Dunmore to say that the lens was of twelve inches focus, and the aperture *f*-192. Could he see any image with that aperture?

Mr. DUNMORE said yes, and showed some whole-plate pictures taken with it. He made the preliminary focus with full aperture, and finally with the stop in position. Mr. Dunmore said the lenses were not cemented, but as close as they would go, and the stop close in front outside. He could obtain full exposures in London in moderately dull weather in three seconds.

Mr. COWAN could not understand how Mr. Dunmore could obtain the results with a spectacle lens in the proportion of three to sixteen as compared with an ordinary lens.

In the opinion of Mr. MACKIE, one of the pictures shown would have received from him an exposure of twenty seconds on an Ilford ordinary plate.

Mr. HOWSON was asked to give the exposure from the Ilford meter. He did, and it was sixteen seconds.

Mr. WILLIAMS said he had experimented with the "pinhole aperture" some time ago by drilling a hole of one hundreth of an inch through a ruby.

Mr. CROFTON (a visitor) said he had not had much experience with exposure meters, &c., but was of opinion that all except Watkins' ribbon were of little use for interiors. Outside, one could more or less do without a meter, but for an interior the Watkins was the thing.

Brixton and Clapham Camera Club.—May 1.—Dr. REYNOLDS (President) gave a demonstration upon the intensification of gelatine negatives by the cyanide of silver, ammonia, bromide of copper, and uranium processes, after which Mr. THOMAS explained the method of making lantern slides by contact, the slides being subsequently shown by the lantern.

Central Photographic Club.—May 4, Mr. W. D. Welford in the chair.—Mr. FRED. O. BYNOE delivered a lecture on *The Capabilities of an Automatic Film-changing Hand Camera, with a Fixed Focus Lens.* The lecturer dealt in detail, and explained the action of the claw, the knife, the hook—or perforation—and other systems of changing the sensitive film. He claimed great advantages for films over plates, and mentioned a fact that a parcel of exposed films received had been accidentally opened, and on development only two or three were lost owing to fog, the balance only showing it along the edges to a slight degree. The value of a fixed-focus lens and its theory were explained at length, and illustrated by diagrams, as were also the use of magnifying lenses for near objects. The swing back, and its advantages in photographing architectural and other objects were lucidly described and illustrated. The mechanism of the Frena camera was shown by means of models and diagrams, and the uses of the various parts explained. At the close of the lecture a large number of slides of varied subjects, made from negatives taken with the Frena, were shown with the lantern.

Croydon Camera Club.—On Wednesday, the 2nd inst. (Messrs. W. H. Grant and Albert Jenkins were elected members). A full gathering assembled to inspect a collection of the chief works of Mr. Shapur N. Bhedwar, which were displayed upon the club staging. The President shortly sketched the career and photographic achievements of Mr. Bhedwar, drawing particular attention to the fact that in the speaker's estimation the rapid and successful progress attained by the gentlemen in question is largely due to his having from the beginning placed himself under the guidance of a distinguished and experienced photographer. Special attention was bestowed upon the well-known *Feast of Roses* series, which were medalled at Pall Mall in 1890. Much appreciative and animated discussion ensued, members being warm in their approval of many of Mr. Bhedwar's exquisite productions notably, *Leila* and *In love with her own wondrous song*, the figures in both being natives of our Indian Empire of considerable refinement and charm of person. At the instance of the President, the club's thanks were awarded to Mr. R. W. Robinson, by whose kindness the photos were placed at the disposal of the President. Messrs. Burn, Wreford, Noaks, Packham, Frost, and others showed examples of their work. In consequence of the date of the proposed excursion to Cambridge falling upon Derby Day, it was notified that another day would be fixed upon, probably June 13.

Hackney Photographic Society.—May 1, Dr. Roland Smith in the chair.—The HON. SECRETARY showed boxes of Primus Indestructible Labels, and Kent's plate duster, the latter being a handy contrivance, consisting of a double strip of plush velvet affixed to a handle, seemingly well adapted for the purpose intended. Work was shown by Messrs. Guest, Hudson, and Hemler, the latter gentleman exhibiting prints on Eastman's platino-bromide paper. Several members expressed approval of the paper in question, Mr. Grant stating that he had made some enlargements upon it which were fully equal in appearance to platinotype prints. Mr. Herbert said, in reference to this point, that bromide paper would produce effects equal to platinotype if properly used. Bromide paper also possessed an advantage, in that it could be used with thin negatives. This being the occasion of the Annual General Meeting of the Society, the report of the year's progress was produced by the Hon. Secretary and the Hon. Treasurer, and revealed a very satisfactory state of

affairs. The roll of membership has increased, and financial matters are satisfactory. It is pleasing to note, too, that the weekly meetings have been well attended. From the arrangements which have been made for numerous outings, demonstrations, papers, &c., during the forthcoming season, there is every reason to hope for still further progress. After the alteration and modification of several of the rules, the election of officers and council was proceeded with, and the following is the result:—*President:* Dr. Rowland Smith.—*Council:* Messrs. R. Beckett, G. J. Avent, T. H. Smith, E. Puttock, F. Houghton, W. L. Barker, W. A. Hensler, and F. W. Gosling.—*Hon. Curator and Excursion Secretary:* Mr. A. Dean.—*Hon. Lanternist:* Mr. A. Rose.—*Hon. Treasurer:* Mr. J. O. Grant.—*Hon. Secretary:* Mr. W. Fenton-Jones.—*Hon. Assistant-Secretary and Recorder:* Mr. A. D. Fort.

Rotherham Photographic Society.—May 1, Dr. F. B. J. Baldwin (President) in the chair.—One new member elected. Platino-bromide prints, by Eastman Photographic Materials Company, and by the Hon. Secretary, shown. An excursion to Bolsover Castle, Derbyshire, was arranged. The President gave a demonstration on the Platinotype Company's method of printing and developing—cold-bath process.

Southampton Y.M.C.A. Photographic Club.—April 3, Annual Meeting.—Mr. J. T. Witt was unanimously elected President, and Messrs. A. T. Doggrell and F. J. Lander as Hon. Secretaries. The following new rule was proposed and adopted, viz., "Honorary members can have key of dark room on payment of a fee of twopence to the caretaker; other amateurs on payment of threepence. Members of other Y.M.C.A. branches free." A discussion took place as to the reduction of subscription, but it was thought best to let it remain as at present, viz., 2*s.* 6*d.* per annum. The first outdoor meeting of the season took place at Winchester and St. Cross on Saturday, April 7 (permission to photograph the interior of cathedral having been kindly granted by Dean Kitchen), and was well attended.

THE first Evening Meeting of the season took place on Tuesday last, May 1, the President (Mr. J. T. Witt) in the chair, and there was a large attendance.—The Secretary reported that some alterations and improvements had been made to the dark room, and that it was open for use every week-day from ten a.m. to ten p.m. At a Committee meeting held the previous week, a number of prints were selected (enough to fill four frames) to be sent in to the Salon Art Society's Black and White and Photographic Exhibition, to be opened on May 7. The results of the Winchester meeting were then examined and criticised, and it was thought a decided improvement had been made upon previous work. Two hon. members were then elected, and it was announced that a few more could be elected by making early application to the Hon. Secretaries. A short time was then passed on the subject of reducing and intensifying negatives, and some prints were shown on Eastman's new platino-bromide paper. The next meeting of the Club will take place at Romsey on Saturday afternoon, May 19. Members are also asked to attend the meeting of the Shaftesbury Rambling Club on Whit Monday, when they visit the New Forest under the guidance of Mr. W. H. Rogers (author of *The Guide to the New Forest*).

Photographic Society of Japan.—March 16, Mr. H. G. Parlett in the chair.—Mr. I. Tanaka showed a collotype from a group taken with the new Goerz double anastigmatic lens. This was of particular interest, as being the first specimen of work done here by this, the latest outcome of the new Jena optical glass, and said to be superior even to the Zeiss anastigmatic lenses, specimens of the work of which had been shown at previous meetings of the Society. The double anastigmatic was shown. It is a symmetrical lens, working at *f*-7·7, and having the combinations close together, so that it will include a wide angle. The focus of the particular lens shown was about twelve inches. The subject was a group, the members of which had been arranged in a straight line. The size was 12 × 10, and the lens had been used full aperture, the exposure having been made with a shutter. There was absolutely no perceptible difference in definition between the central and the marginal figures. The instrument is, in fact, a rapid wide-angle lens, with a perfectly flat field, and is devoid of astigmatism. Mr. W. K. BURTON then showed Dallmeyer's newest form of tele-photographic lens. If he had known that Mr. Kajima was going to disappoint them in the matter of his promised views of Fuji, he (the speaker) would have brought samples of the work of the new lens, and have given a full explanation of its working. This he would do at the next meeting. In the mean time, he would only say that the new lens seemed to reduce tele-photography to the greatest simplicity it could be reduced to. Mr. Burton also showed some work with Edwards's orthochromatic plate, and showed the yellow screen that he used. The screen was made simply by coating "patent plate" with a solution of gelatine and picrate of ammonia. The screen was placed in actual contact with the plate, and this, he stated, was the right, *and the only right place*, for a screen when using *dry* orthochromatic plates. The results were much better than with a screen of optically ground glass near the lens. Picrate of ammonia was of the exact colour wanted for orthochromatic work, the curve of absorption nearly corresponding with the curve of sensitiveness of bromide of silver. Then there was the ease with which screens of the kind he showed could be made. Mr. K. Arito had coated half a dozen of them, of different depths of tint, in half an hour. Messrs. W. K. Burton and M. Kondo then gave a demonstration of the "Carbon," or pigment process.

California Camera Club.—The Annual Meeting of the California Camera Club was held in the rooms, April 4.—Reports from the officers were read showing the condition of the Club. The President's remarks were of a general nature, as he left the details to the other officers. He called attention to the social aspect of the Club as something which would not be touched upon by the latter, and advised an increase in the number of smokers and ladies' nights, which have proven so pleasant the past year. The Secretary's report showed that, in spite of the dull times, the Club holds its membership well. There are now on the rolls some 400 members of the various classes. The Treasurer announced cash on hand 550 dollars. The library of the Club is now in fine condition. During the past year it became necessary to double the shelf capacity. For two years the Board of Directors have appropriated a fixed sum each month for the purchase of new books. This has been expended with excellent judgment by the Librarian, and the Club now owns over 200 bound volumes, covering every branch of photography. Every first-class photographic magazine published in the English language is kept on the tables. During the year the Club has given twelve lantern-slide exhibitions, free to members and their friends. These lectures are given in a hall seating over 1400 people, and yet late arrivals are always compelled to stand. The Club, in conjunction with the *Examiner*, also gave an exhibition, mostly of members' work, in the form of a Christmas festival for the entertainment of the poor children of the city. The Annual Pay Show, consisting entirely of members' slides, was given in December, and netted the Club 750 dollars. The success of these lectures is due to the regular Exhibition Committee having them in charge. One of the most interesting reports was that of the House Committee. The developing rooms have been remodelled, and the incandescent light introduced into them and all the rooms of the Club. An arc light of 6000 candle power has also been fitted in the bromide room for enlargement and lantern-slide work. An entirely new room, fifty feet by eighteen, has been erected on the roof of our present quarters. Ten feet of this is partitioned off for printing purposes, and allows sunlight at all hours of the day. The remaining space, forty by eighteen, is used as a portrait studio. It has a fine north side light and a sky light, and dressing and developing rooms are attached. A large part of the Treasurer's surplus is to be immediately expended on backgrounds and other accessories. When these are in place, very few professionals will have as fine an operating room or as many conveniences for all sorts of photographic work as the members of the California Camera Club. We shall be pleased to put these rooms at the service of members of other clubs visiting our city. The election has excited great interest, and the largest vote in the history of the Club was polled. Most of the contests were very close, but a count of the ballots showed the election of the following Directory:—*President:* Chas. Albert Adams; *First Vice-President:* H. C. Tibbitts; *Second Vice-President:* W. J. Street; *Treasurer:* Geo. W. Reed; *Secretary:* C. F. Cormack; *Librarian:* H. C. Owens (unanimously re-elected);—*Corresponding Secretary:* C. S. Close.—Messrs. W. E. Goodrum, W. B. Webster, T. H. Jones, and F. Fuller.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8515.—"An Improved Instrument for Calculating the Time of Photographic Exposures." W. H. PHILLIPS.—*Dated May*, 1894.

No. 8573.—"An Automatic Swing Back for Photographic Cameras." J. MARTYN.—*Dated May*, 1894.

No. 8576.—"Improvements in Automatic Apparatus for imparting a Rocking or Oscillatory Motion to Cradles or Bassinettes and to certain Photographic and other like Appliances." F. A. COWARD.—*Dated May*, 1894.

No. 8615.—"Improved Method of producing Photographic Magic Lantern Slides, Pictorial Representations, Prints, and the like, from Living or Artificial Models without the aid of Scenic Effects, by Combinations of Artistic and Photographic Manipulations." Complete specification. F. F. WEEKS and J. RILEY.—*Dated May*, 1894.

No. 8620.—"An Improved System of Brass Clips to Photographic Slides or Changing Boxes." F. HOLMES.—*Dated May*, 1894.

No. 8642.—"Improvements in Methods for Ascertaining Photographic Exposures." N. G. THOMPSON.—*Dated May*, 1894.

No. 8769.—"Improved Adjustment for Camera Rotary Shutters." W. J. LEES.—*Dated May*, 1894.

No. 8881.—"Improvements in Photographic Cameras." J. GAGE.—*Dated May*, 1894.

No. 8968.—"Improvements in Printing Frames for Photographic and other purposes." E. H. M. SEYMOUR.—*Dated May*, 1894.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

METHYLATED SPIRIT FOR NEGATIVES.

To the EDITOR.

SIR,—On this matter it is important for photographers to note that methylated spirit now contains a fraction of one per cent. of ordinary paraffin oil. It is therefore quite unsuitable for treating negatives, the reason being that the oil is emulsified or "fixed" by the gelatine, thus leaving the semi-translucent markings which your correspondents complain of. Before paraffin oil was added to methylated spirit, I used the spirit often when I wanted to dry a negative rapidly, and it was always effectual. Pure spirit of wine should now be used, and, as its drying property depends upon the removal of water from the gelatine, the best way to proceed is to allow the negative to drain for a few minutes, preferably on blotting-paper; then pour the spirit gently over the negative, held at an angle, allowing the spirit to fall into a developing dish. Wash three or four time in this way, and reserve the spirit for future use. Chemists and druggists are allowed to sell pure spirit of wine for scientific purposes in quantities not exceeding eight ounces at a

time. I would suggest to those who have negatives spoilt with methylated spirit that they should put the negatives in a dish of ether—that prepared from methylated spirit. This will dissolve the paraffin oil, and will not damage the negative.—I am, yours, &c., P. M.

May 4, 1894.

PHOTOGRAPHS OF SNOW CRYSTALS.

To the EDITOR.

SIR,—In the *Photographische Rundschau*, 1894, p. 126, is a short notice on the photographing of snow crystals. It mentions an article in your JOURNAL on this subject. The author concludes: "The editor of THE BRITISH JOURNAL OF PHOTOGRAPHY does not seem to know anything about Berlin and Dr. Neuhauss, and that a whole book on snow crystals, illustrated by photographs, has appeared there. No, Berlin is so far from London; it is better, then, to go to Russia."

Dr. Neuhauss has published in several journals (*Photographische Rundschau, Eder's Jahrbuch, Prometheus, &c.*), articles on snow crystals accompanied by figures. His photographs are, however, few and rather poor, and the directions given by him for the photographing of snow crystals entirely misleading. He seems to attach a special importance to the fact that, as he claims, his photographs are the first of this kind. This is a perfect mistake, and, while he charges you with not knowing or not mentioning his work, he does not say a word about a publication by far more complete than his own, which he cannot have been ignorant of. This is a pamphlet published by me a year ago, first in a Swedish scientific journal, and afterwards in *Comptes Rendus*, and in *La Nature*, October or November, 1893. I have taken about 200 photographs of snow stars. I send you with this same mail a copy of the book. My first photographs of this kind were taken as early as 1890, and an *Englishman, Mr. Waters, has taken photographs of snow stars* 1887.* Now, as Mr. Neuhauss seems to attach a special importance to, and be very proud of his supposed priority, I should think it proper, though the matter is of no great importance to me, that his statements were corrected. I therefore take the liberty to offer you as many of my *original* photographs as you think appropriate to reproduce. If a short article treating the subject from a photographic point of view would interest your readers, I am willing to furnish it. If you accept my proposal, please let me know how many plates I can dispose of, and if you wish a figure of my apparatus (constructed especially for this purpose). The autotypes in my book do not give at all the finest details of the photographs; it is necessary to reproduce them in heliotype.

The enclosed copies are from negatives of snow crystals taken in 1893, magnified sixty times. The photographs are made with a Seibert microscope apochromatic 16, against a dark background.—I am, yours, &c.,

G. NORDENSKIOLD.

Academy of Sciences, Stockholm.

[We defer our remarks on this letter until next week.—ED.]

TONING, &c.

To the EDITOR.

SIR,—I was much interested by your article on toning prints in last week's issue.

It fully endorses a series of experiments I made about two years ago, to determine the composition of the image in toned gelatine-chloride prints. However, I noticed a very considerable part of the image was still metallic silver, notwithstanding the prints had been in the gold bath a very considerable time. No doubt silver sulphide would give a very permanent image, but I am very much inclined to doubt whether the images obtained in this way are composed of that salt.

Sulphide of silver toning has the great drawback of staining the whites sooner or later. A process of "sulphuration" seems to fringe the high lights with a yellowish tinge, which will, if favoured by damp, eventually extend all over the whites. The tendency to this is very marked in the case of gelatine-chloride papers which have been allowed to stay some time in such a bath. I fancy this is accounted for by the reduction of metallic sulphides contained in the paper facing. Some samples of baryta papers show it more than others; therefore a careful selection of one's paper is the first essential to success in toning by "sulphur."—I am, yours, &c., J. B. FINDLAY.

April 30, 1894.

HARE'S NEW DOUBLE DARK SLIDE.

To the EDITOR.

SIR,—Permit me to correct a mistake in the report of the Photographic Club in your issue of last week. The double dark slides by me are described as being of metal. They are of wood, the hinged shutters only being of metal; hence their lightness.—I am, yours, &c.,

May 7, 1894. GEO. HARE.

* Neuhauss commenced his work in 1893.

A ONE-SIDED ARRANGEMENT.

To the EDITOR.

SIR,—The "Explanation" by which, after the lapse of three weeks, the Editor of *Black and White* seeks to place before your readers what he is pleased to call the "other side" in our disagreement, aggravates very seriously my cause of complaint against him. To accuse me by implication of suppression is bad enough when there is no foundation whatever for the accusation, but to manufacture a case to make this contention plausible must surely be the outcome of some form of mental aberration. He says: "Mr. Stowe wrote offering views of the Howard Memorial, and was told that we should be glad to see them as soon as possible after the unveiling ceremony." My reply to this is that there is not a scintilla of foundation for a word of it! Since the backbone of this "Explanation" is now "nailed to the counter," it is hardly necessary for me to reply to what he, with very questionable taste, says as to my work being sent later than that of my "rival," or to comment upon the fact that he carefully avoids any direct allusion to the arrangement made at his own solicitation. He makes no excuse whatever for the retention of the photographs sent him until they were too late for any other paper, while his remarks as to the necessity for promptness were met in anticipation in my previous letter by the fact that Saturday (the day he admits receipt), or even Monday, were named, by people who must be thoroughly conversant with the subject, as being well within the limits of time.

My letter to you contained a plain and full statement without colouring or concealment of my experience in trying to carry out an arrangement with the Editor of *Black and White*, and he will scarcely gain credit by his reply to it.—I am, yours, &c., DRURY STOWE.

Bedford, May 7, 1894.

THE CAMERA CLUB CONFERENCE.

To the EDITOR.

SIR,—At the Camera Club Conference, the Rev. F. C. Lambert is reported to have said: "Through the influence of photography, skies, clouds, water, breaking waves, &c., were now represented in painters' work with greater accuracy than twenty-five years ago." Will you allow me to contradict this statement, and to say, that skies, clouds, water, breaking waves, &c., were studied as closely, and painted twenty-five years ago by painters just as accurately, as nowadays, as any picture gallery will show? In which way could the painter be guided here by Photography at all? One look at the sky and clouds, &c., with their corresponding colours, would surely be a far better and safer guide than any look at the clouds, &c., in a photograph.—I am, yours, &c., B.

GAS CYLINDERS.

To the EDITOR.

SIR,—The following circular, which was recently addressed by this Chamber to the makers and compressers of gas cylinders, and the annexed reply of the Brin Oxygen Company will, no doubt, interest your readers, and I shall therefore be glad if you can find space for the same.—I am, yours, &c., KENRIC B. MURRAY, *Secretary.*

The London Chamber of Commerce,
Botolph House, Eastcheap, London, E.C., April 17, 1894.

COPY.

"*April* 17*th*, 1894.

"PHOTOGRAPHIC TRADE SECTION.—GAS CYLINDERS.

"DEAR SIR,—Referring to the Conference which was held here on the 23rd February last, I shall be glad to learn, for the information of the above Trade Section of this Chamber, whether the manufacturers and fillers of these cylinders have taken any steps with the view of arriving at a uniform system of manufacturing and filling, or of standards as to the quality of the material and strength of the cylinders, and also of the pressure to which they should be filled, in order to ensure perfect safety in their conveyance and use. If nothing has been done up to the present, I shall be glad to learn whether you think a further Conference of the manufacturers and fillers by themselves would be likely to be productive of practical results. If so, this Chamber would be willing to afford facilities for such a Conference.

"I am, dear Sir,
"Yours faithfully,
"KENRIC B. MURRAY,
"*Secretary.*"

COPY.

"BRIN'S OXYGEN COMPANY, LIMITED,
"34, *Victoria-street, Westminster, April* 23, 1894.

"THE SECRETARY,
"London Chamber of Commerce,
"*Botolph House, Eastcheap, E.C.*

"COMPRESSED GAS CYLINDERS.

"DEAR SIR,—In reply to your favour of the 17th inst., we believe there is almost complete accord between makers of cylinders and compressers as to the construction and testing of cylinders for compressed gases. It is now generally known that the Brin Companies, after long investigation, and acting on th

opinion of Professor Unwin and other experts, refused, in the interest of the public generally, to fill certain cylinders of one particular make. It is to be regretted that there was not a larger representation of makers at the conference to which you refer, as we fear the conversation which took place, coupled with this recent action on our part, led to the impression that there was a difference of opinion between makers and compressers as to the methods of proving cylinders before filling them with gas. This is far from being the case, and it may be added that the weight, expansion, and other tests employed by the Brin Companies have been generally accepted by cylinder makers, and are approved of by experts of the highest standing, to whose opinion reference was made in the paper on *Gas Cylinders*, which was read some time ago by the present writer, and which was also referred to at the meeting.

"He suggested that cylinder-buyers should procure some form of guarantee from both makers and compressers. The makers should certify as to the thickness and quality of the metal, and the general construction of the cylinders, and the compressers as to the hydraulic and other testing, and subsequent filling pressure. We are now, however, induced to go a little further, and suggest that the real solution of the difficulty is for gas dealers to purchase their cylinders only through the compresser by whom, in all probability, the cylinders will afterwards be filled. Were this done, compressers would be willing to give a complete guarantee with cylinders they sold.

"If the compressers had not actually manufactured the cylinders themselves, they would have been constructed to their own specification with an absolute knowledge of their requirements, and by making their own arrangements with the makers they would be in a position to vouch for the material and construction of the cylinder, as well as the subsequent testing. It is the compressers who are really exposed to such danger as exists in the cylinder trade, and it need hardly be pointed out that the additional security which the adoption of this course would ensure is, in that respect, greatly to their interest. Hitherto the real danger to compressers has existed, not in connexion with their own cylinders or those sold by them, but in connexion with cylinders which have come in from private owners and dealers to be filled, and of which frequently no trustworthy information can be obtained. If the question of cylinders is again brought forward by the Photographic Trade Section, we venture to suggest that this view of the matter be submitted to the meeting for discussion. Since the Bradford accident the general feeling has been to saddle the compressers with as much responsibility as possible, and this feeling has been much strengthened by the action of the railway companies. We are ready to take this responsibility, but, in so doing, we are entitled to decide for ourselves as to what is a suitable cylinder. If, in future, all cylinders were procured through the compressers, the additional cost would be trifling—if indeed anything—and both the purchaser and the compresser would have the satisfaction of knowing that the cylinder was one which had been tested and proved in all respects. This proposal is made, not with any view of the compresser deriving direct commercial advantage from such an arrangement, but because it is regarded, in the absence of Board of Trade regulations, as the only practicable way of establishing the uniformity and thorough reliability of cylinders in this country.

"All established compressers are virtually agreed amongst themselves as to the best kind of cylinders for the trade, as well as the right system of testing, and we may venture to claim that the long record of immunity from accident enjoyed by this Company is the best possible evidence of the fact that proper precautions have hitherto not been neglected, and that the system we employ is a good one.—Yours faithfully,

BRIN'S OXYGEN COMPANY, LTD.
per KENNETH S. MURRAY,
Engineer and Manager.

Answers to Correspondents.

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

G. G. BAGSTER.—Received.

T. PENELL (Sandown, Isle of Wight).—Possibly the proportion of gold is too small.

A. M. Z.—See pages 865–6 of the ALMANAC for 1894. You will find formulæ for stock solutions of metol in the proportions named.

F. S. J. G.—The purpose is not clear. Sulphite of soda is, *per se*, a solvent of the haloid salts of silver. This may give you the information you require.

OTHELLO.—We should scarcely care to recommend the process on theoretical grounds, although practically it might answer. Thanks for the enclosure.

T. W.—Certainly. Make your first essay in photo-micrography with the lowest power, and attain a degree of efficiency with that before trying with the "eighth."

C. BESON (Belfast).—The query seems unintelligible. Ivory miniatures are painted direct on the ivory with water colours. Is that really what you desire to know?

A. C. B.—As we have no idea of what the "Patent Adhesive" is composed, or, indeed, have heard of it before, we can hazard no opinion as to its suitability for photographic mounting purposes.

R. REED.—We are not at all surprised that you are unable to obtain hypochloride of lime at the local druggists. If you ask for "chloride of lime" at the nearest oil shop, you will obtain what you require.

A. BIGNELL.—The easiest way to make a solution of thick flakes of gelatine is to soak the flakes in cold water for twelve or fifteen hours, or until they are softened throughout, and then apply heat. It will be found very troublesome to dissolve the flakes direct in warm water.

J. N. WILSON.—It would prove advantageous if a supplementary lens, either made of glass, or, if hollow, filled with a dense fluid, were made use of. Instead of filling the large shells with water, try the effect of a fluid much more dense. This will shorten the focus materially.

W. M. L.—No special appliances are necessary for taking cloud negatives beyond those in general use. Any ordinary plates of good quality will suffice, but it is advisable to back them. We strongly suspect that you have been giving a great deal too much exposure. Try with considerably less.

TONES.—The trouble is due to your using the bath in its concentrated form. It should be diluted with six or eight parts of water. In the acetate bath the proportion of gold should be one grain of the chloride in eight or ten ounces of solution. Then the toning proceeds slowly, and is well under control.

LENS.—The lens you have, being of larger diameter and shorter focus than the one your friend has, will not define so well in planes other than those focussed. To make it equal, it must be stopped down, when, of course, it will be slower in action, as is your friend's. "Depth of focus" and large apertures are incompatible.

INQUIRER says: "I want to obtain some photographs as specimens, unmounted preferred, in *carte-de-visite* and cabinet size, and larger sizes. Where could I purchase same reasonable?"—In reply: Our correspondent sends neither name nor address; and, if he did, we should do nothing to encourage this disreputable traffic in specimens.

WM. HOLMES.—Better send the lens to an optician to fit stops in the centre of the lens in place of those now in the hood. He will ascertain the actual focus of the instrument, and fit and number the stops accordingly. Of course, it is impossible to say what apertures the diaphragms should be from such data as "about seven or seven and a half inches focus."

S. WALTHEW.—There is no general rule as regards photographing in English cathedrals. In some a small charge is made for the privilege, in others none; but permission must first be obtained from the Dean or other functionary. The best way will be to interview the verger at the different cathedrals when you arrive. So far as we are aware, photography is not prohibited in any of the cathedrals in England.

T. BIGGS.—In visiting the Antwerp Exhibition, you will experience no difficulty with the Customs officials if you have your packets of plates properly labelled, or politely explain what they are, and that they would be spoilt if opened in the light. As regards photographing in the Exhibition itself, we cannot say what the arrangement is. Probably there are some restrictions, but what they are at present we are unable to say.

T. FEUTCH.—There is no law that will prevent you from photographing the church if you plant the camera in the road, or, indeed, anywhere else, if you have the permission of the owner of the property on which you erect the camera. Because some one else has taken a photograph, and made it copyright, of the edifice, it will not prevent any one else doing the same. Evidently the rector is totally ignorant of Copyright Law.

T. A. C. writes: "Three years ago, when in Venice, I bought a number of large views of the place. They were very cheap, as compared with pictures of English subjects of the same size. Unfortunately, they are all fading rapidly. Can anything be done to save them? As they are unmounted, would washing them be of any good?"—We think not. In some instances rewashing will hasten the fading rather than otherwise. Fading is a very common fault with foreign views.

A. T. FIDLER.—1. Let the condenser consist of a pair of plano-convex lenses 2. The alteration to suit the focus of either objective may be effected by a slight motion of the lamp to or fro. 3. A four-and-a-half-inch diameter will prove most useful. 4. Purchase the condensers ready-made. They are now procurable at a very low price. 5, 6, and 7. Single achromatic lenses, plano-convex in form, and two and a quarter inches diameter, will serve your purpose quite well. The flat side must be towards the screen.

D. JAMESON says: "A lady friend of mine has just had some portraits taken, and was charged double the usual price, because she wanted them in platinum. I have seen the pictures, and I feel sure that they are not platinotypes at all, but merely ordinary bromide prints on matt paper. Is there any simple way by which one, with but little chemical knowledge, can ascertain with certainty whether any deception has been played, and, if so, has the sitter any redress? I ought to say that platinum print is stamped on the mount."—If one of the prints be immersed in a solution of bichloride of mercury, and it is a bromide picture, the image will be bleached; if it is a platinotype, it will be unaffected. Any one supplying bromide prints, and represents them as being platinotypes, offends against the Trade Marks Act, and renders himself liable to heavy penalty.

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ROUNDNESS OF FIELD IN LENSES.

HEN the properties of the ideal lens are sought to be enumeted, the one thing that is never overlooked is flatness of field. oreign opticians have of late, by a suitable kind of glass, been le to obtain this property, conjoined with a numerical or gular aperture of a degree of intensity sufficiently large to rmit of an instantaneous exposure being given. The object this brief article is to impart a word of comfort to those who id themselves content to adhere to the use of lenses which ve a pictorial, in contradistinction to a scientific, degree of arginal sharpness.

For copying maps, plans, or engravings, a lens cannot have o flat a field, coupled, of course, with the highest excellence in finition. When an operator in this class of work cannot cure perfect sharpness all over his plate, he does so by the nployment of a small diaphragm, which will give him all the finition he desires, although at the expense of having to ve a longer exposure, a matter of little consequence when posing on an immovable subject with a dry plate.

When taking a view in a street, an alley, or one of any kind which the sides approach the camera, the centre of the scene ing at the greatest distance, it is desirable, nay, indispensable, at a lens having a slightly rounded field be employed if the nest marginal definition be desired, for, the sides of the subject eing so much nearer than its centre, the rays emanating thereom will, after transmission through the lens, have to travel rther to come to a focus than if such sides were at a distance; nd, according to the laws of conjugate foci, they will ave their cones elongated to such an extent as to practically ome to a focus on a flat plate. A lens carefully corrected for bsolute flatness of field will prove to be inferior for work f this nature.

This is also the case in the photographing of a group which as been so arranged, as most groups are, that the elements at he sides shall be no farther from the camera than those xially situated with regard to the lens, the roundness of field f which gives sharpness to every individual from the centre to he extreme margin. We have seen a modern lens, which, purorting to have a flat field, has, *more Hybernico*, had this proerty imparted to it in so pronounced a manner as to have vershot the mark, and give a bellied field. In taking a group r view of any kind with such a lens, it can only work at its est if the centre of the picture be nearest to the camera, both ides of the subject receding.

A lens of either the landscape or rapid rectilinear class, aving a round field, not unfrequently conduces to pictorial xcellence by reason of its very defect. Let us imagine a andscape composition, the chief point of interest in which is situated at, or near to, the centre of the plate. Due prominence must be given to the principal object, to which everything else ought to be subordinated. If the lens have a round field, and an aperture of reasonably large dimensions be employed, the central or chief object in the composition will be sharp, and unimportant trivialities at the margins, because of the roundness of field, will suffer in definition, fulfil the requirement of subordination, and lead the eye to the point of interest on which it will rest with the greater satisfaction, because of the impaired surrounding definition, very much as, in music, a full and well-resolved chord is the better appreciated because of its having been led up to by preparatory discord.

But a lens corrected for the acme of flatness would prove inadequate to the producing of such an effect. The sides of the subject, which might be dull and uninteresting, would have an importance imparted to them by their perfection of detail to which they were not pictorially entitled, and which even a skilful photographer could not hope to attain with the more perfect tool. One of lesser perfection exercises by contrast a power of discrimination as to what should be placed in subordination to the leading theme. It need scarcely be said that, if more marginal sharpness were desired, this could be obtained by having recourse to the services of the diaphragm.

A practical question may here arise as to the controlling of the field, so as to obtain either roundness or flatness. Premising that a skilful optician combines his lenses (in the case of a double combination) so as to give the flattest possible field with freedom from astigmatism and flare spot, we desire, just at present, to arrange the lenses so as to produce for ourselves any other effect conducive to our immediate requirement.

Here is a rule which, if not suitable for every lens, will yet be found to be right in the main. The approximating of the lenses of a cemented compound to each other favours rounding the field of delineation; their separation flattens the field, although at the expense of astigmatism if carried too far, while, if the lens be a single achromatic or landscape one, a round field is produced by bringing the stop nearer to the lens than when in its best position, and a flat field is obtained by removing the stop farther away. The former is got at the expense of possibly having to employ a slightly diminished stop, and the latter at the cost of decreasing the area of illumination of the plate.

We do not counsel any one who desires to make home experiments in any of the directions above indicated to do so with the original mount of the maker of any special objective, but to unscrew the lenses, and lay the mount carefully aside, and extemporise a rough mount for experimental purposes—in short, to act up to the old adage of *experimenta in corpore vili*.

Having thus stated the advantages arising from employing

lenses having a slight roundness of field—and this embraces almost all those in use at present—we turn to those of most recent introduction, the anastigmatic ones, with absolute flat fields. Although we have not tried any of them, yet must they prove very useful in including a wide angle with a stop larger than can be used with the others for this purpose. Hence, for instantaneous exposures, the negatives from which are to be subsequently enlarged, a considerable gain ought to accrue, for one obtains with a large stop a negative possessing greater marginal sharpness than can be got with other lenses, unless a smaller aperture be used.

THE PROPORTION OF GELATINE AND SILVER IN FILMS.

Although the question of the quantity of silver contained in commercial films, so ably treated by Messrs. Haddon and Grundy in their paper read before the London and Provincial Association, is of very considerable interest, there is another which is of even greater importance to the practical photographer, namely, the relative quantity of gelatine carried by each plate.

It would be idle to suppose that the actual quantity of silver in the dried film, as it reaches the consumer, is a matter of no moment provided such film proves capable of rendering gradation and density in a satisfactory manner, for it is mainly on that one point that those qualities depend. In fact, it may be accepted as an axiom that it is only those films that are of a robust character and rich in silver that will give the very best results, under all circumstances and under any variations of conditions. It is true that emulsions have been made containing abnormally small proportions of silver, and have yet proved capable, under favourable circumstances, of giving ample density, but it would be altogether too much to claim for them that they could compete on equal terms with richer emulsions in the all-round qualities of sensitiveness, gradation, and, above all, latitude. In fact, so far as our own experience of such preparations has gone, although the sensitive salt may be in such a peculiar molecular condition as to give extraordinary density when reduced, the films containing it have invariably being deficient both in sensitiveness and in power of rendering gradation.

From a manufacturing point of view—we are not here referring to the commercial phase—it is, of course, important to be able to make a good working emulsion with as small a proportion of silver as possible, but the smaller the quantity employed in the first place the more perfect must be the system of working in order to avoid loss during the process. If half a dozen different processes or methods of emulsification were tried side by side, the same proportions of silver to the ounce being employed in each case, it is very probable that the finished films would be found to vary very considerably in the relative qualities of metal actually contained, and we believe at the present day most makers of emulsion are cognisant of the fact that, in order to ensure a thoroughly reliable plate, it is necessary to emulsify a far larger proportion of the precious metal than is found in the finished product.

We may go back to a date far anterior to the introduction of gelatine plates to show that the apparent density or opacity of the sensitive film had little to do with its working qualities. In the days of iodide of silver and acid development, the nature of the film itself compelled a certain amount of density, that salt being naturally of a more opaque character than the other haloids; but, on the introduction of bromo-iodide and, later, of plain bromide films, we became acquainted with a class of plates whose transparency would astonish a present-day photographer, and which yet gave images possessing a degree of vigour seldom seen now, except in negatives for process work. This, of course, need not cause any surprise when acid pyro or gallo-nitrate of silver formed the developer, as in those cases the image was built up by the deposition of metallic silver from the solution itself, and not as in alkaline development by the reduction of the metal in the film itself. But the same will hold good in later days after the introduction of alkaline pyro, and we have in mind at the present time many negatives of extraordinary vigour produced upon collodio-albumen, bromised collodion, and collodion emulsion plates that scarcely appeared to have a film upon them when dry, and this without any after-intensification.

Provided, then, that a particular plate is found to contain, in a given area of film, such a quantity of silver as experience shows suffices to give it the character of a good all-round plate, there does not seem to be any advantage in its having a higher proportion. In fact, if the process of manufacture is such as to confer upon the smaller quantity the power of giving all necessary density and gradation, the introduction of a larger quantity would seem to tend towards spoiling the gradation and giving too much density, and many plates we have met with from time to time have seemed to suffer from that fault.

In the earlier days of the gelatine process, before the introduction of the "boiling" and the "ammonia" processes, the quantities of silver included in the published formulæ were much smaller than those that ruled later on. At that time the silver was emulsified in the presence of the full quantity of gelatine, and consequently, from the more viscous nature of the mixture, the bromide was formed in an exceedingly minute state of division, and was retained in suspension during the whole process without any loss. In Bennett's original formula, for instance, 110 grains of silver nitrate sufficed for ten ounces of emulsion; whereas, later, the proportion rose to twenty grains, and even more, to the ounce.

But the later methods of emulsification, in aiming at the production of sensitiveness in a shorter time, brought about the formation of the silver bromide, not only in a much coarser form, but also in a far less viscous mixture, and one therefore less capable of holding it in suspension, from which it resulted that much of the silver originally employed was either filtered out in too coarse a state, or else lost through being allowed to deposit from the thin solution.

While, then, the proportion of silver in the plate would seem to be a matter that chiefly affects the maker, the proportion of gelatine is one that, though it affects him to a certain extent, is of far greater moment to the consumer. So far as the maker is concerned, a certain quantity of gelatine is necessary, in the first place, to hold the silver bromide in suspension, and to make a decently heavy film. Beyond this, the more gelatine present in an emulsion the easier will it be to handle, to a certain extent, and the less likelihood is there of loss of silver from deposition. The emulsion can be kept hotter, for easy coating, without the silver subsiding too quickly, and it will set more expeditiously when spread upon the glass, both matters of some importance, either on a small or a large scale.

But to the photographer who uses the plates the matter assumes a different complexion. The larger the relative proportion of gelatine to silver, or, in other words, the thicker

the film, the greater will be the troubles arising from the physical nature of the gelatine. Here, however, let us interpose a word in explanation of what we really mean in speaking of the "proportion of gelatine" and "thickness of film." Let us suppose an emulsion to be taken that is what is technically known as "rich in silver," that is to say, that contains a large proportion of silver to gelatine, and let this be spread upon glass in such a manner as to give the thinnest film that will yield a satisfactory result. Such a film would answer under favourable circumstances, but would break down for want of latitude under very slight stress. A double coating, or, what under the circumstances would be tantamount to it, a single coating of double thickness, would in this case be an advantage, the additional thickness of gelatine being compensated for by the increase of silver accompanying it.

But imagine the same emulsion to be diluted with an equal bulk of plain gelatine so as to reduce the proportion of silver and gelatine to one-half. Now, can we suppose that, if such a thickness of this modified emulsion as to carry the minimum quantity of silver as before were applied to a plate, it would behave in the same manner? Possibly it might so far as the mere question of density and gradation is concerned, though even that is doubtful, and then, when the coating had to be increased to meet emergencies or to confer latitude, we should have an unnecessary and inconvenient addition to the thickness of the gelatine.

Matters are very different now as compared with a dozen years ago, so far as gelatine is concerned, owing to the efforts of the gelatine-makers to meet the requirements of photography. Then the *bête noir* of "dry plates" was the gelatine itself, the chief trouble being "frilling," which, of course, became more prominent as the thickness of the film became greater. Now all trouble from that source, and, indeed, the minor ones of spots and suchlike, may be said to have practically disappeared, and what do remain are of a simpler character and easily met with care, though the necessity for so much care might perhaps be still further reduced.

For instance, the time of development, of fixing, of washing, and of drying are all materially affected by the proportion of gelatine to silver, not merely by the thickness of the film. A film containing a large proportion of silver is more rapidly permeated by the solutions than one of the reverse character. The particles of silver are more quickly acted upon by reducing agents; therefore the development would be more rapid with a film containing a small proportion of gelatine; the fixing the same, while, as for the washing and the chances of permanence, the convenience would be inexpressible.

On the other hand, there are other points to be considered. A certain proportion of gelatine is necessary, not only to bind the particles of silver salt together, but also to give the latter sufficient protection to render development possible, and perhaps, too, to confer keeping qualities on the silver salt, which we could scarcely expect to retain its good properties unless preserved from atmospheric influence. The question is, Has the minimum been reached in the matter of gelatine to silver? and we are inclined to answer that it has not, though whether it is commercially practicable, without necessarily giving more silver, to give less gelatine is a point that must be left to the manufacturers.

Disfigured Views.—Lord Rosebery did yeoman service to Art at the Royal Academy Dinner when he denounced the increasing disfigurement of landscapes and seascapes by hideous advertising boards. But where is the practical remedy? A farmer may plant, or have planted, in his fields anything he chooses, and what is found remunerative is not likely to be abandoned by him—or the advertisers. Painters have the advantage over photographers, with regard to these ugly boards; they can omit them from their pictures. The photographer must forsooth include them or forego the picture altogether.

Antwerp Exhibition.—The town of Antwerp has always been a happy hunting-ground for British photographic tourists, but this year, without doubt, it will see more cameras at work than it ever has done before. This is not to be surprised at, seeing how quickly and cheaply the place can be reached and the great attractions that await the visitor in all directions. Those, however, who intend going will do well to defer their visit for a few weeks, as, by the latest accounts, the Exhibition is yet far from being completed. It is certainly a little novelty for English railway companies to become photographic exhibitors, but we learn that both the Great Western and Great Eastern Companies are showing a large and fine collection of photographs of places of interest and beauty served by their lines, the latter company having also some very large photographs of cathedrals, churches, and other buildings in the eastern counties. By the way, both these companies are to be commended for embellishing their carriages and waiting-rooms with superb photographs in place of the hideous advertisements with which some companies still disfigure theirs.

Photographic Evidence.—Photographic portraits are now generally received with some reservation in the law courts, and, evidently, they are not always conclusive in a police court when they happen to be of the feline race. In an amusing case, a few days ago, about the ownership of an Angora cat, the complainant was shown a photograph of a cat, and at once pronounced it not a bit like her "Fluffy," whereupon the defendant produced the original, when she at once declared that it was her animal. The magistrate remarked that the photograph seemed to be that of the cat in court. However, without expressing an opinion, he adjourned the summons for the attendance of the photographer. Here it would seem that with the photograph of a cat it is not evidence unless supplemented by the photographer who took it. It used sometimes to be said that one baby was so much like another that one stock negative would serve for several—so it may be with "fluffy cats," particularly if they have moved a little during the exposure. All who have tried it are aware that it is by no means an easy matter to take a successful photograph of a long-haired cat in a studio with which puss is not familiar.

The Picture Market.—It is certainly surprising, considering the spread of Art, that the picture market is at the present time in such a depressed condition. Only a few weeks back, at an auction sale, a well-known London picture dealer was enabled to repurchase a painting at about an eighth of the price he had sold it for a few years ago—some thousands of pounds. Last week, at a similar sale at Willis's Rooms, a Corregio, *The Virgin seated with the Infant Saviour and St. John*, realised but a hundred guineas, and a G. Metsee, a small panel, *The First Pipe*, but twenty-two pounds. A picture, *Drunkards and Smokers*, by A. Van Ostade, was sold for nine guineas, while six examples by D. Teniers, *The Arrest of the Thief*, were knocked down for twenty-six pounds five shillings, and a pair by the same master, *A Village Festival*, and companion subject, were sold for forty guineas. Works by other noted painters were disposed of at correspondingly low prices. For example, a Vandyck, *Our Saviour Blessing Bread*, sold for no more than fifty guineas—less than half the sum that was given for a single postage-stamp at a recent philatelic sale. It is unnecessary to say that all this has a very depressing effect on struggling artists. Consequently more modest prices are placed on pictures in the Academy this year than is usually the case.

The Annual Exhibition of the Photographic Society of Great Britain will be held as usual in the Gallery of the Royal

Society of Painters in Water Colours, 5A, Pall Mall East, London, S.W. The Exhibition will be inaugurated by a *conversazione* on Saturday, September 22, and will remain open daily (Sundays excepted) from Monday, September 24, until Wednesday, November 14. Admission (from ten a.m. till five p.m.), one shilling. It will also be open on Monday, Wednesday, and Saturday evenings, when lantern slides will be shown; admission (from seven to ten p.m.), sixpence. Members have free admission at any time. They may receive twenty day and ten evening tickets for their friends, and can purchase additional tickets at half price. Members of affiliated Societies can purchase tickets at half price of their respective secretaries. Medals will be placed at the disposal of the Judges for the artistic, scientific, and technical excellence of photographs, lantern slides, and transparencies, and for apparatus. Exhibitors who desire to do so may state whether they wish their exhibits to go before the Art or the Technical Judges, or both. The under-mentioned gentlemen have been elected by the members of the Society to act as Judges, and have consented to serve:—Art Judges: Mr. F. P. Cembrano, jun.; Colonel J. Gale; Messrs. Seymour Lucas, A.R.A.; F. M. Sutcliffe; B. Gay Wilkinson, jun. Technical Judges: Messrs. Chapman Jones, F.I.C., F.C.S.; Andrew Pringle, F.R.M.S.; J. W. Swan, M.A., F.I.C., F.C.S. Blank entry forms and any further information respecting the Exhibition, also nomination form for membership, can be obtained from the Assistant Secretary of the Society, 50, Great Russell-street, London, W.C.

Recent Process Work.—It will be remembered that, a fortnight back, we commented on the strictures passed by Professor Herkomer, R.A., on process work at the Annual Dinner of the International Society of Wood-engravers. Had the Professor's remarks been directed against some of the prints from process blocks in the annuals issued as illustrations of the pictures shown at the Royal Academy, we should certainly have had no fault to find with them—indeed, we might go so far as to emphasise them. These blocks are, as a matter of course, by various houses, all of which are capable of issuing good work, but many of the prints certainly do not show them to advantage—indeed, quite the reverse. Professor Herkomer, in his speech, said that "the immorality of cheapness and the immorality of haste were the causes of the threatened extinction of wood-engraving." This remark applies equally as well to process work as it does to the art of wood-engraving, and this fact should be kept in mind by those who have to do with it. Had a little more time been taken in getting these annuals out, no doubt the results would have been better. Many of the shortcomings in the prints is as much, if not more, due to the printing as to the blocks themselves. The best block may be entirely misrepresented in the printing; indeed, it may be said that the finer the block the more is the care required in its printing, and the better the paper it should be printed upon—conditions incompatible with excessive haste and cheapness. It is to be hoped, for the credit of English process work, that some of these editions will have but a limited circulation abroad, as many of the impressions they contain are by no means representative of the general run of what is done here.

ON THINGS IN GENERAL.

Messrs. Haddon and Grundy's paper, read at the London and Provincial Photographic Association, is a most valuable contribution to a remarkably slightly investigated branch of photographic technics. Of course, the plate-makers may say, "It is no business of the public to know how much silver is in our plates; they must take them or leave them, as they see fit." But this is not a proper position to take. Quite apart from the fact that their processes are simply the perfected expansion of the discoveries or inventions of ardent and generous experimentalists in times not long past, who freely gave from their truly inestimable stores the means to revolutionise the practice of photography, and who might not unfairly ask to receive similar treatment for themselves—apart from all these considerations, the practice of photography is now so progressing towards exact science, that it is incumbent upon its professors to have more than empiric data to work upon so that increased successes may be built up. To further this, the experiments referred to mark progress, and I and all are indebted to these gentlemen for their valuable and unpaid efforts. What the work means can only be really understood by those conversant with chemical manipulation, and those who are so conversant will all bear testimony to the immense amount of labour expended. It is only to be regretted that the Editor could not see his way clear to the publishing of all the data obtained.

The occasional reader of photographic literature would rub his eyes when reading the discussion on photogravure processes at the recent meeting of the "parent Society," for the amount of attention devoted to "devils" would be in no slight degree embarrassing. It would puzzle him to read of this, that, or the other member who had been troubled with "devils," and he would probably think it might be wise to communicate with the nearest temperance head-centre. But, when he came to read still further, and found one speaker had gravely announced that "there were two kinds of devils," he might more probably wish to refer to a well-known work on demonology. While on this topic of photo-mechanical processes, the mind naturally turns to the great outcry raised by Mr. Gamble's paper; I mean Mr. W. Gamble; though there are two kinds of Gamble also, it must not be supposed that I desire to link them with the other two kinds just alluded to; nevertheless, the tone of some of the letters on the subject would suggest a belief in the writers' minds of some sort of affinity. It would have saved a world of trouble, heart-burning, and printer's ink, if the original Mr. Gamble had said he was alluding not to these processes capable of demoniacal possession as before alluded to, but merely to the innocent "zinco." I have worked at wet plates myself, so know a little about them, and I have seen others at work also, and my experience has been that I have been possessed by surprise at the beautiful, clean negatives produced by men working in the most appallingly slovenly fashion, while the results, from others, apparently most clean and neat in their operations, have been full of spots, streaks, and irregularity. Let me, however, here interpolate a remark, lest I should be supposed to inculcate the practice of the methods of the sloven: these were occasional instances only, and not typical.

I suppose it will not be mere ineptness discussing these mechanical processes at all after Mr. Herkomer's fulminations; he has spoken of one of them as an evil thing. It cannot be doubted that some of the earlier, and, indeed, some of the latest results well deserve the title of evil things (really it is very difficult to get out of this groove of bad spirits); it is difficult to speak too strongly in expressing the detestation aroused by some of the process trash we see; but, now that artists of great and admitted ability draw in a certain special fashion for the express purpose of having their work "processed," it is too late in the day to speak of the want of rapport between the minds of the artist and the process worker. Besides, this kind of illustration is in its merest infancy; what it will be when it arrives at the period of adolescence who shall say? Mr. Herkomer, too, forgets one thing when he is expressing, certainly in guarded language, an implied praise of American wood-engraving. When the great advance (perhaps he would term it alteration) of the wood-engraver's technique was first introduced, when wood-engravings were produced in America the like of which had never before been seen, they received here from experts the strongest possible condemnation—the style was tricky, the methods not adapted for wood, and the whole effects mechanical endeavours of a reprehensible kind to imitate the artistic touch of the original. But American wood-engraving has lived all that down, and is now held up for our admiration, through Mr. Herkomer justly lauds Thomas and other English masters of the art.

It struck me in reading Mr. Yeames's remarks at the Camera Club Conference that he who was brought to bless stayed rather to curse our art. Certainly he blamed photography for its effects upon painters, in causing them to paint pictures tending to muddiness, and, as to photographic results themselves, he was pleased to adopt the time-honoured term of "mechanics" in describing them. These results of mechanics were so nauseous to him that they gave him "a

sensation of repulsion—the same feeling, in fact, as if he had detected a forgery." "Methinks he doth protest too much."

It is very sad still to see complaints from operators of having had their specimens stolen. As I have before said, the fault is not infrequently their own; but, where the retention of specimens has been fraudulently meant, no words are too strong to express one's opinion of such flagitious conduct, and few punishments would be too severe to punish those who rob others of their means of obtaining employment. I am afraid that so long as it is found worth while to pay for advertisements such as I saw in a recent issue of this JOURNAL, so long will this nefarious practice continue. The advertisement I speak of runs thus:—"FIRST-CLASS SPECIMENS wanted at once, all sizes, unmounted, and with right to exhibit." Who are the people who would exhibit bought specimens, and what their object?

FREE LANCE.

PHOTO-MECHANICAL NOTES.

CONSIDERING the vastly increasing importance of the subject, it is surprising that so little attention has been paid to the question of the optical principles involved in the production of the divided negatives used in the half-tone photo-engraving processes. It is not to be expected, of course, that process workers in general should have an intimate knowledge of the mathematical niceties of photographic optics, but some of the recognised authorities might do well to turn their attention to the subject, and, with their usual public-spiritedness, give to us some basis to work upon. Even the best of our half-tone operators are ready to confess that they are at present groping in the dark, and every day they stumble upon unrealised possibilities.

Before the advent of Levy screens, there was nothing particularly scientific to consider in the operation of taking a half-tone negative. We had a single line screen, produced, as a rule, by photographing a proof from a ruled copper plate. This screen was unsealed—that is to say, there was no cover glass sealed to the film side for protection—because it was thought that, the nearer you could get it to the sensitive plate, the better. Generally, the screen and sensitive plate were in the same carrier, with only a thin silver wire at the corners to partition them. The exposure was divided into two periods of time. After the first period, the dark slide was very carefully removed from the camera, taken to the dark room, and, if the screen was square, it was turned a quarter revolution, so that the single line would cross the angle of its previous position. In some cases, to facilitate this, a pair of screens ruled opposite ways was used, and various methods were adopted to obviate the necessity for removing the dark slide from the camera, such as by having the screen in a carrier which drew out of the dark slide in the same way as the shutter, but with these methods I need not concern myself whilst describing the principle. To continue, the dark slide was returned to the camera, and the exposure finished. The result was always the same, *i.e.*, crossed lines all over the negative, rendering isolated dots on the zinc. If the original was good, the result was passable, but the blocks produced in this way were, on the whole, flat and insipid. The only improvement ventured upon in this way of working was to occasionally give one way of the screen a trifle more exposure than the other, a departure which, it was thought, gave rather more contrast.

The screens used in these "single-line" days were never very clear, but the Germans soon improved on them by laying an opaque ground on glass, and ruling through it with an engraver's ruling machine. This, we know, was a tedious and uncertain operation, and it was found best to make one plate in this way, which they termed the "mother screen," and take copies from it. From this point the Yankees took up "the running," and Wolfe brought out his now famous screens, which were collodion dry-plate copies, produced by contact from a "mother" screen. At first they were single lines, supplied either in pairs or as a square plate. A conspicuous improvement introduced by Wolfe was in making pairs of single-line screens, both ruled the same number of lines to the inch, but one plate bearing lines which were three times the thickness of the transparent spaces between. In using a pair of screens by this method the thick line screen was put on first, and an exposure given of sufficient length of time to bring up all detail in the shadows. The thin-line screen was then inserted, but only an exposure given of such duration as to simply cross the lines formed in the high lights of the picture. Thus the harshness of the regular dot-effect-all-over effect was avoided. In the result the picture seemed to have a texture running strongly in one direction, yet in no way impairing the effect. I may here remark that I have noticed this appearance in the very beautiful specimens issued by the Swan Electric Engraving Company, but, whether their blocks are produced by some such method of screening as I have described I am unable to say.

The next and most important step of all in the production of screens was the introduction of Mr. Max Levy's ruled gratings. The far-reaching results of this wonderful invention cannot be overestimated. It was an improvement in half-tone process work as decided as the advent of collodion after Daguerreotype, or as dry plates after wet collodion, and, when the historical record of this branch of process work comes to be written, tribute must be paid to the man who made the half-tone process universally possible. It is less than three years since Levy put his screens on the market, and it is hardly eighteen months since their value began to be widely recognised—in this country, at all events. Continental workers are only just beginning to realise that the vast superiority of English work over their own has been due chiefly to the adoption of the American screens.

But, when process operators proceeded to make use of the Levy screens, a new set of conditions in manipulation was imposed upon them. To begin with, the screens are cross-lined, and it seemed difficult at first to realise how the dot effect was to be brought about in the resulting block, for it was naturally argued that the light passing through the transparent spaces in a screen of crossed lines must form a dot on the negative, and consequently a repetition of the screen upon the zinc. So firmly convinced were many workers on this point, that they actually made a positive screen of dots from the original, and used the copy. A further difficulty which appeared to present itself to their minds was that the screen, being formed of two pieces of plate glass sealed together, and forming something like three-sixteenths of an inch in thickness, would place the sensitive plate too far away from the lines of the screen, and that a blurred effect must inevitably be the result. The blurring has, indeed, been a difficulty which most beginners in process work have been beset with. Of its remedy I must say more anon.

In practice it was soon found by the earliest users of the Levy screen that, if the exposure was sufficiently prolonged, the square dots first formed on the negative gradually spread laterally until they became round and touched each other—just as would four coins placed flat on the table and brought together—leaving a transparent space between. This effect is most marked in the high lights, where the lateral spreading is naturally greatest, and this is just where the dot effect is wanted in the ultimate result on the block. It was found that, to ensure the spreading of the dots in the high lights of the negative, it was absolutely necessary that the screen should be a certain distance away, and Levy had practically ensured this by making his glasses thick. Thus did one difficulty overcome another.

But all workers did not get over their troubles so easily, and I am frequently asked by beginners to account for the blurred effect of the screen which they get on the negative. The screen effect was there all right, but the dots were not sharp. They told me they had tried placing the screen at various distances; they had overhauled their bath, developer, collodion, and everything. The trouble was at first somewhat difficult to account for, because I had not experienced the same difficulty myself, and others who had bought Levy screens had secured the proper results right away. The cause was found in a least suspected quarter, it was in the nature of the lens used. In all cases where the lens was of comparatively short focus, and especially with wide-angle lenses, the blurred effect was most marked, whilst, with rapid rectillinear lenses, it did not seem to matter much how far away the screen was, within reasonable limits, so long as the lens was proportionately stopped down.

The stopping down of the lens was found, in the early stages of using Levy screens, to be an important point, and it is seldom found that, at the usual distance of the screen, a stop of greater aperture than *f*-16 can be used; and, further, that the use of larger or smaller stops modified the shape of the dots in the negative. For instance, it was found that, in order to get dots in the shadows of the negative, it was necessary to use a comparatively small stop. Hence a departure in practice was to give a portion of the exposure with a large stop, and the remainder with a smaller one.

But the most startling departure from optical principles was a method of stopping down, which is practised in America, but is not yet generally known over here. Instead of the usual round stop, they have tried, with good effect, stops of various irregular shapes, such as square, rectangular, and triangular openings, and one peculiar shape, formed of a square opening, with two of its diagonally opposite corners further extended by cutting out small squares, so that the stop looks, as nearly as I can describe it, somewhat like the letter Z.

with a perpendicular and very thick downstroke. I hear that much attention is being given to these apparently empirical methods in America with remarkable results. My own experience in this respect coincides with that of some of my friends whom I have asked to try these dodges, and whose opinion on process matters I esteem most highly. The noticeable improvement is, that the dots spread more readily on the negative, and give a better gradation of tone in the block.

To sum up, we find in practice (*a*) that a certain distance of the Levy screen from the sensitive plate is necessary to bring about the discriminating dot; (*b*), that a lens of long focus is necessary; (*c*), that the stops govern the shape and disposition of the dots. I do not attempt to explain this theoretically; I rather prefer to invite the attention of optical experts, not for the mere explanation of the thing, but because they may indicate fresh lines for improvement in methods of half-tone work.

WM. GAMBLE.

JOTTINGS.

A HASTY visit to New York for business purposes is answerable for the fact that the month of April passed without the appearance of my usual collection of "Jottings" in these pages. To feel, dear reader, that you missed me would be a state of bliss to which I can hardly dare aspire and may not deserve; but I, on my part, can tell you that I was sorry to have to forego my brief periodical chat with you. "We two" have been good friends thus far, and, I trust, may long continue so. By the way, mention of New York reminds me that, although it is the fashion throughout the photographic trade and profession on this side of the Atlantic to lament the badness of business as compared with things in the States, there is no cause for much complaint, but rather matter for rejoicing, inasmuch as the photographic business on the other side is simply in a condition of immitigable decay. Wherefore, dear brethren and sistren, let us be glad that somebody is worse off than ourselves. This is a heartless sentiment, but it is human nature, you know.

Twaddle seems to have been the principal outcome of the Camera Club Conference, if we except the useful talk on the keeping properties of films initiated by Mr. Pringle. The little group of "superior persons" who run the Dudley Gallery Salon must feel rather small and foolish at the handsome dressing down which Mr. W. F. Yeames gave them for their pseudo-artistic pretensions, so that, on the principle of evil coming out of good, I may venture to hope that the Conference will be held next year. Perhaps then the Salonists will learn that not only are they not artists, but are not even photographers—a matter upon which there is great doubt already.

Here is a true photographic story for you. In a certain small village, remote from large towns, a marriage is rarely solemnised, the consequence being that all but a small percentage of the population are illegitimate. One day an amateur photographer took a group, outside an old cottage in the village referred to, of a good-looking young woman with several children about her, the entire party having the common mono-parental characteristic of the place. Oblivious or forgetful of this peculiar circumstance, the amateur, when remitting a presentation copy of the print to the adult sitter, entitled it *Waiting for Father!*

The paper on *Silver in Commercial Gelatino-bromide Dry Plates*, by Messrs. Haddon and Grundy, which was read before the members of the London and Provincial Photographic Association, suggests the old simile of the play of *Hamlet* without the Prince of Denmark. In other words, it is printed (see the JOURNAL of April 27) with the principal part omitted. Evidently the table giving the amounts of silver in the various commercial dry plates must have contained some strong arithmetical contrasts, otherwise I presume the figures would have been given. Figures, it has been said, can be made to prove anything; but, assuming that Messrs. Haddon and Grundy's results, whatever they were, indicated disparities in the quantities of silver found on different brands of plates, it is difficult to imagine what point of practical importance could thereby be proved. The table, if published, would, in all probability, have given rise to considerable unpleasantness among the few, and a great deal of unprofitable discussion among the many, so that, on the whole, its omission is rather to be welcomed than deplored. The unanimity with which the editors of all the photographic publications appear to have accepted this view of the matter is a grand tribute to their journalistic acumen, impartiality, and wisdom. The photographic public should be proud to be catered for by such paragons of discretion, while, as for the plate-makers, I am quite sure that they have severally pressed all the editors to their manly waistcoats, and wept tears of joy and gratitude over this magnificent demonstration of fearless, disinterested, public-spirited blue-pencilism.

To some extent I must own to sympathising with Professor Herkomer in his recent remarks on process work, and its unfortunate effect in driving the art of the wood-engraver to the point of extinction. Not only do I agree with him that the public is suffering from an overdose of illustration, but I am bound to say that I also think the nature of the most popular method of illustration is such that it is not likely, from its very ease and commonness, to enjoy a long career of appreciation. It is the very property of half-tone zinc or copper blocks that gives to them their distinctive quality which I fancy is destined to bring about their early disfavour. I allude, of course, to the use of the screen. The "fixed mechanical" grain of the print is, I believe, objectionable to many, by reason of its obvious artificiality; and, speaking for myself, after having scanned many thousands of such prints, very little sensation of pleasure at viewing a screen picture as such remains to me. I am glad to notice that several of the younger and more enterprising of the half-tone process firms are turning out work which bears evidence of a more judicious use of the screen than is commonly met with. What I mean is, that the grain is scarcely apparent, although the effect of gradation in the tones is duly obtained. Of course, the kind of grain selected is largely governed by considerations of printing, but I am only speaking of effect, and that, after all, is what the public is influenced by. The charm of good wood-engravings is such that I do not think Professor Herkomer is far wrong in prophesying a revival of their popularity.

From certain remarks which have appeared in one of the photographic papers during the last few weeks, it appears that some of the members of a London Photographic Society have risen in revolt against smoking and alcoholic refreshment at its meetings. I sympathise with the objectors. Enforced contact with those who are smoking, for any length of time, has a nauseating effect upon me, so that I quite enter into the feelings of the anti-tobacco party. My own view of the matter is that photographers would best consult the promotion of their own intellectual and scientific advancement by eliminating beer and tobacco from their discussions; and certainly, if there are attending members of a Society who object to the presence of the so-called "soothing" weed and the cup that cheers (?) at the meetings, ordinary politeness demands that their objections should be allowed; for, to many persons, nothing is so unpleasant and distasteful as enforced association with smokers and drinkers—except, perhaps, the obligatory society of people who have only an occasional practical acquaintance with the elementary uses of soap and water.

The published synopsis of two lectures on *Colour Photography* that have been recently delivered enable me to give off an idea on the subject which I have long had in mind. It is this: Granting that one day the problem is solved in the manner which the public at large and not a few well-informed and thinking people hope for, namely, to the end that positive photographs in natural colours will be obtainable at so many shillings per dozen, I have a fancy that it will only be in respect of the reproduction of natural scenes and views that the results will give unalloyed satisfaction in the æsthetico-

artistic sense. As a rule, an aggregation of manufactured objects, whether you select dress fabrics, house fronts, the contents of houses, the furniture of urban highways, the expression of the bill-poster's art—in short, all the products of human industry—are replete with chromatic inharmonies, the photographic perpetuation of which, in all probability, would not be provocative of so much pleasure to us as we now suppose. We have only to realise the forcefulness of this notion by imagining an artist painting any of the scenes or objects I have mentioned, with the most literal regard for the colours of them, to understand the probability of colour photography having the same unsatisfactory, because truthful, effect. Of course, I am not only excluding natural scenes from this purview, but also relics of antiquity mellowed by time—old buildings, towns, villages, and so forth; but even here I should not be surprised to find the hand work of the artist preferred to the camera image, however accurate the latter might be. At any rate, my point is, that, while we are prophesying and hoping for the early perfection of photography in natural colours, it would be a useful sedative if we asked ourselves whether it is likely, after all, to be such a great boon and blessing as we now suppose.

So there are now two "platino"-bromide papers on the market. The use of the prefix is a decided compliment to the platinotype process, and one not likely to lead any sensible photographer to suppose that the new papers contain platinum, any more than the now generally used term "bromide" print implies that there is bromide of silver or bromide of something else in the print. COSMOS.

THE ALUM BATH.

JUDGING from what one reads in the various home papers, there has been much trouble with the alum bath lately, or, more correctly speaking, these troubles have been taken more notice of. On one point at least there has always been a great divergence of opinion, viz., as to whether the alum bath should be used before or after fixing. In my own experience I have never used an alum bath after fixing a plate. Having taken up photography when wet collodion was still a power even in amateur ranks, when dry collodion was a convenience inconveniently given to spots, and gelatine emulsion was in the experimental stage, the alum bath was a stern necessity, but it was a necessity speedily felt. No waiting until it was only necessary to prevent the film from melting before it dried; the trick was to get the alum over the plate before frilling took place, after—immediately after—development, or not at all, for we hardly realise how very much washing was really necessary with gelatine films to secure a good keeping negative. And now, after nearly ten years' experience in a hot but dry climate, I know that if alum is wanted—and I invariably use it whether wanted or not—it would be at least superfluous to use it after fixing and washing. When the air is dry, the evaporation from the film is sufficient to keep it cool until dry. Not until it is dry is care needed, and then you must see that heat does not rip it from the glass.

Amongst the best pieces of advice given regarding the use of the alum bath is the following, which I cull from the last number of *Photographic Scraps* which has reached these shores: "Don't forget to wash well before and after, and don't use too strong a solution or leave the plates too long in it, or you may get a leathery, ridgy appearance on the plate." Very good advice as far as it goes, but faulty in one respect, as it gives only a partial explanation of the cause of the said leathery ridges. Provided that I have the same phenomenon in my mind as the writer of the passage quoted, I have had some experience of the said ridges, and, as I have investigated the cause and reproduced them at will, I take up my pen to benefit the reader with what is the most important point, how to prevent them. But let me first describe them to prevent any misunderstanding as to what I really mean.

On taking the plate out of the alum bath, these ridges are barely perceptible, even if looked for in the dim light of the dark room; should, however, you pass the palm of your hand over them when washing under the tap, they are distinctly felt. When the plate is put in the hypo these ridges obstinately refuse to become clear, and the appearance is so like the coarse, scumlike marks produced when coating with the fag end of your emulsion that you feel disposed to anathematise the plate-maker. I never met with this trouble until a cessation from much developing led my mind away from the condition of my baths. Then I noticed that my alum bath was much discoloured, and I took some fresh solution. The trouble disappeared, and did not reappear again until similar circumstances led to similar results. Feeling now assured that the cause did not lay with the plates, I sat down to think the matter over, the direction my thoughts took being towards the alum bath.

In my early efforts at qualitative analysis, alum salts were my *bête noir*, as they always were, and always will be, to the beginner. It is not enough that they clog the filter paper, and prevent the passage through of compounds of the alkalies and alkaline earths. If ammonic chloride has been too scantily applied, aluminic hydrate will find its way through the filter paper, and simulate aggravating symptoms of the presence of other compounds, which confirmatory tests fail to substantiate. Let me draw attention to a simple experiment or two. Take two or three ounces of your alum solution, and add to it a few drops of ten per cent. ammonia; a white gelatinous precipitate is formed; but, on stirring with a glass rod, this is seen to dissolve in the course of a minute or so. Add a few more drops of ammonia, and continue the stirring; again the precipitate dissolves. This operation may be repeated several times, the precipitate taking a longer time to disappear with each successive addition of ammonia, until, at last, the alum solution appears to have absorbed all the ammonia it is capable of doing. Now take a strip of gelatino-bromide plate and immerse one-half of it in weak ammonia. Then, without washing, immerse one-half of the ammonia-immersed end in the solution of alum, to which the ammonia has been added. After it has been so immersed for a few minutes, give the whole strip a brief rinse under the tap, and then transfer it to the fixing solution. You will find that the portion which has been treated with ammonia and alum resists for a long time the action of the hypo; the gelatinous precipitate of hydrate of alumina formed in the gelatine film has clogged it, as it will clog a filter paper in unskilled hands, and the hypo is obstinately refused an entrance.

Here, then, is the cause of the evil. If the film has not received sufficient washing to remove all the alkali when transferred to the alum bath, the pores of the gelatine, either wholly or in part (and gelatine is never homogeneous), get clogged up, or are liable to get clogged up, unless the alum solution is fresh. When the alum bath has been in use for some time, its ability to dissolve the hydrate diminishes and the leathery ridges are more liable to be formed. It is necessary, therefore, to give a certain amount of washing, if possible. Wash well if the film will stand it, but by no means attempt to economise on so cheap an article as alum. There is yet one other point—possibly a minor one—to consider, and it is this: The presence of ammonic chloride assists the precipitation of aluminic hydrate by an alkali or alkaline carbonate. Assuming that ammonic bromide acts in the same manner (I cannot say that it does, as I have not tried it), there is a small amount of this carried into the alum bath with every imperfectly washed plate. This would tend to aggravate the evil, but the amount is so small that its practical effect may be neglected. But, if small, it must, at least, be remembered that its tendency is of a deleterious nature. As to any pyro that may be carried into the alum bath, it certainly cannot improve matters. The effect of spent hypo in conjunction with ammonia and alum on a gelatine film it would, in the present state of our knowledge, be idle to speculate upon. This much is certain, that no easier method of bringing a peck of troubles upon oneself could be devised than emptying a dish of old developer into the alum bath. Yet this is what one is inclined to do, slowly yet surely, if not from carelessness, yet through inadvertence. Of this I am fully assured, that the accumulation of minute proportions of ammonia to the alum bath is a serious evil; and I would sum up with this advice, Wash well after development if the film will allow it, but be sure of the purity of the alum bath. You will then be able to use alum safely when it is most needed, and not have to wait until after fixation and washing, when an alum bath is almost a superfluity.

One more word in conclusion. Although I wish strongly to deprecate the false economisation of alum, it is a question well worthy of consideration as to whether it may not be advisable to add to the alum bath a little citric acid. The effect of such an addition would be to neutralise traces of ammonia, and it need not be added in any large quantity. One-tenth of the quantity of citric acid that would be put into an alum-and-citric-acid clearing bath should be quite sufficient when the main object to be considered is, how to keep the film firm and intact. C. RAY WOODS.

AMERICAN NOTES AND NEWS.

"Dressing" the Part.—When ladies sit for their photographs in an assumed character, how hard it is to induce them to dress as becometh such character! We have an engraving of the

wife of a rough Mississippi boatman, whose hut, far removed from the nearest neighbour, stands severely alone on a wild part of the coast of the "Father of Rivers." Standing on the muddy shore, she warbles in song to her husband, who is in his boat far out on the river. But her fingers sparkle with diamond rings, in her ears and on her wrists are the most fashionable treasures of the jeweller's shop, her satin attire is a triumph of the French *modiste's* art, and yet she is but a poor boatman's wife, who lives in a shanty! We are reminded of this by the inspection of a really pretty photograph in a recent issue of the *Photographic Times*. It is entitled *The Fruit-seller*, and represents a handsome, muslin-attired lady lolling at ease—in fact, doing the *laisser-aller* in the most perfect manner conceivable—a pearl bracelet on her arm, and an orange in her hand, with a pine-apple, a bunch of bananas, and a few grapes as accessories. We are not finding the slightest fault with the picture, which does credit to the artist, Shapoor N. Bhedwar, but we cannot help contrasting it with the fruit-sellers we can see at every hour of the day in Covent Garden, hardy, horny-handed, bronze-visaged daughters of toil, who, *as* fruit-sellers, push business in a way that would surprise the lady whose portrait gives rise to these observations.

John A. Tennant.—We are gratified in finding in *Wilson's Photographic Magazine* a portrait and biography of Mr. John A. Tennant, associate editor of that journal. Mr. Tennant is a native of Darlington, and went to America in 1889. It is interesting to note the number of photographic papers in the United States that are edited by Englishmen. New York alone furnishes at least three such.

Bogardus on Post-mortem Photographs.—As we have said on a former occasion, we read Abraham Bogardus's writings with a great deal of pleasure, on account of the mixture of philosophy, fun, and sound practical advice contained in them; for Bogardus not only possesses a vast amount of photographic experience and knowledge of incidents, but he further possesses the happy knack of being able to narrate them in a pleasant, jaunty, taking manner. Here is a brief extract from his latest, in the *St. Louis and Canadian Photographer*, and one which will provoke a smile on a dull day:—"The man who advertised to take 'deceased persons at their residences' has changed the wording of his advertisement. He said, people laughed, asked foolish questions, and winked the other eye. One man asked, 'At what temperature he could work his plates?' Another, 'Whether he found the fumes of sulphur damaging to photographic chemicals?' And a lady asked, 'Whether he had ever brought back any views of Beulah Land?' He told her he had not travelled abroad, and wondered what she was laughing at. To avoid misunderstanding, he made the advertisement read: 'Dead people wishing to be photographed will be promptly waited on by the undersigned: satisfaction guaranteed.'"

ON THE PRODUCTION OF REVERSED NEGATIVES.

To many workers who are desirous of undertaking some of the more advanced branches of photography, such as the carbon single-transfer and several of the photo-mechanical processes, the production of reversed negatives becomes a matter of considerable importance, and I have no doubt many are deterred from undertaking even such a simple, but beautiful, printing process as the production of single-transfer carbon prints on opal, from no other reason than the necessity of using a reversed negative in all cases where the picture has to appear in a non-reversed form.

It is true that in some instances, such as busts in portraiture, the reversed negative may be dispensed with; but, as a general rule, when the single-transfer process is being worked, and the natural position of the picture has to be retained, the employment of a reversed negative is absolutely essential, provided the worker is not an expert at double-transfer work, and I know of several enthusiastic amateur workers who have relinquished carbon work on opal from this reason alone, for, when they attempted the double transfer on to its final support, failure more often than success attended their efforts. With single-transfer working, however, from a reversed negative, provided a reasonable amount of care be exercised, there need be no fear of failure; in fact, carbon printing becomes one of the easiest and most beautiful printing processes in photography. There is no doubt, however, that single-transfer work loses many patrons for the simple reason that special negatives are not provided for this particular class of work.

A very general opinion prevails also that the obtaining of a reversed negative is a matter of considerable difficulty, entailing the detaching of a delicate gelatine film from the surface of its support by means of hydrofluoric acid, and then dexterously reversing the film on a specially prepared new support. No doubt this *modus operandi* is practised largely by expert workers, and is quite a practical operation when gone about by those thoroughly conversant by practice with the necessary way of properly overtaking the work, but with the great majority of even full-fledged workers it is far too formidable an operation for them to indulge in, there always being a dread of failure, with the consequence of losing, it may be, a valuable negative.

Luckily, however, for the casual worker, there are several other equally good, and certainly safer, methods of obtaining reversed negatives, and in the following remarks I shall endeavour to refer in as practical a manner as possible to these methods.

In all cases where it is desired to undertake single-transfer carbon pictures, say, from negatives of outside subjects, such as landscapes I know of no better plan to follow than that of specially exposing the plate in such a manner as to obtain a reversed negative by exposure direct on the subject in the camera, and this can be accomplished very simply by merely placing the plate in the cells with the glass side towards the lens. I have been told by some workers that they would be afraid of not getting the necessary amount of sharpness in the resulting negative by practising such a method; but this objection is purely fanciful, and to such I suggest trying the following more crucial operation in proof of the assertion that the glass side of the plate being turned towards the lens and the film exposed through the glass in no way detracts from the sharpness of the image:—

Let those anxious to test this set up a page of printed matter, and proceed to photograph it as mentioned, viz., by placing the sensitive plate in the cells glass side towards the object; this done, reverse the ground glass in the camera, so as the plain glass of the focussing screen is turned inside the camera when focussing, or, better still (if it is possible), focus on a sheet of ground glass so reversed in one of the dark cells, with wet-plate slides—this is an easy matter; but to those not having a wet-plate slide, with its folding side door, the former method will be quite sufficient to ensure absolute sharpness if due care be taken in focussing and a small stop employed in the lens. They will be surprised at the result in the way of absolute sharpness all over the reversed negative. Another objection I once heard urged against this method of obtaining a reversed negative was the certainty of scratching or injuring the film of the sensitive plate, by the same coming into contact with the springs of the dark cells; but I suppose it is the old story—everything is easy when you know how to properly go about it. It never occurred to the party in question to protect the sensitive side of the plate by means of a card the same size as the plate, lined on one side with velvet or other soft material.

The method described is within the reach of every worker, and I know from experience that reversed negatives may be made in such a manner that will equal, if not far surpass, those produced by any of the more complicated methods, and I strongly recommend all those enthusiastic workers who have a leaning to carbon work to get into the practice, when out photographing, of providing themselves with at least one or two cells charged with plates as described, viz., with the glass side down, and then protect the films by placing over them cardboards lined with velvet.

I know of one worker who has got into the habit of exposing two plates on each subject, one in the usual way and the other as described. He then becomes master of the situation, being armed with both direct and reversed negatives, which are suitable for carbon and other special printing methods. The following are among some of the chief points that special attention must be given to if success is to attend the method of working.

Firstly, the worker must be very careful that the glass side of the sensitive plate be scrupulously clean and free from every particle of dirt or overflow from emulsion when coating the plate. The reason for this is obvious. Were any dirt allowed on the glass side of the plate, it would interrupt the rays forming the image when passing through and leave corresponding flaws on the film.

The obtaining of a sharp image is easily accomplished with certainty if arrangements be made whereby the ground glass of the camera can be rapidly removed from its frame so as to permit of either side of the glass being placed against the lens. For the pro

duction of reversed negatives in the manner indicated, the rough side should be outermost. After a time, however, a worker will very likely find such little difficulty in this respect that he will by a mere extra racking of the camera when focussing, always be able to obtain sharp images, a small stop being used in the lens.

To ensure safety of the film, it is a good plan to cover a piece of cardboard with velvet, and to place the same over the face of the sensitive plate while in the slide.

The behaviour of plates exposed in this manner will appear somewhat difficult during the operation of developing, and a worker must be specially careful to place the plate film side up in the dish; this is a necessary precaution, because, from force of habit in development, an operator is inclined to turn the plate round when placing it in the tray. The image will first make its appearance at the back of the glass, and appear somewhat faint; it will gradually develop up, however, and can be examined exactly the same as an otherwise-exposed plate, density being judged in the same way, and, on being finally finished and fixed, should be quite as sharp as a plate exposed film side foremost.

T. N. Armstrong.

GELATINE *VERSUS* COLLODION.

Our editor recently connected my name with early attempts to utilise emulsion photography for photo-mechanical work, so perhaps it may be interesting if I give some of my experience in this connexion.

It will be well to state at the beginning that my acquaintance with photographic matters dates from the year 1853, or thereabout, when calotype and wax papers were not as yet quite superseded by the collodion process, then in its infancy.*

After having given up photography for some years, my attention was directed to it again by the advent of the collodion emulsion processes. As manager of the lithographic department of one of our oldest printing establishments, I thought I would like to renew my acquaintance with practical photography in its lithographic and allied developments, and soon made good progress with collodion emulsion in the making of the necessary negatives. Having found that the coating of large plates with collodion emulsion was more difficult than the similar application of ordinary collodion, attention was directed to the newly introduced gelatine dry plates. Upon applying to a then, and now, celebrated maker of gelatine dry plates, he gave it as his opinion that neither gelatine nor any other bromide emulsion plate would answer the purpose of producing negatives for photo-lithography. Having already experienced that a collodio-bromide plate could be used, I did not feel satisfied that gelatino-bromide could not be used equally well, and bought some of that maker's rapid plates. I was not at all satisfied with the behaviour of those plates, but, looking back, I think the failure was probably as much due to over-exposure as to the unsuitability of the plate. I could not then conveniently turn to the ordinary collodion plate, unless in some of its dry forms, because I wanted to expose in the morning and develop in the evening, and occasionally to depute the exposure to some one else. I was, moreover, much attracted by the greater rapidity of the gelatino-bromide plate, and determined to persevere. Plates, however, were dear, at that time, very dear; but the cost of material was considerably below that of collodion, so why should I not make my own? I did, and for a long time continued to do so, till the introduction of cheap plates rendered it undesirable. During this time I never found any advantage in adding salts of iodine to the emulsion, while in such additions there was a certain disadvantage in the matter of speed, nitrate of silver and bromide of potassium, with the necessary amount of boiling and a suitable gelatine, being found all-sufficient. The great difficulty with me, as an amateur plate-maker, was the successful coating of large plates, from whole-plates upwards. Some of my experience I have never seen recorded. To secure the even coating of large plates with a quick-setting emulsion, more especially in winter, it was found necessary to warm the plates; and such plates would sometimes develop unevenly, so much so, that in some parts there would be *extreme* density with decided thinness in other parts of the same plate. It did not follow that the thin parts were incapable of attaining density, but it seemed only that the dense parts came up with a far greater degree of rapidity, due, as I think, to the plate not being evenly heated, the warmer part allowing a portion of the silver bromide to partially settle down to the surface of the glass. At such places there would be less gelatine surrounding the particles of silver bromide to restrain the energy of the developer. From a consideration of the foregoing, if the reason given be the true one, it should be possible to make plates with a far less amount of gelatine, and if necessary to develop with a greater amount of restraining material. In this connexion possibly gum-arabic solution, as used by Robert Hunt in the Energiatype process (which by the way was subsequently called ferrotype) might be found useful, or perhaps glycerine might be employed with similar effect. Whether photo-mechanical plates made on these lines would prove a success I am unable to say, but I hold to the opinion that a minimum amount of gelatine consistent with absence of frilling conduces to the production of density.

Speaking of density reminds me to say that there is a widespread misapprehension as to the necessity in photo-mechanical processes of an extreme amount of opacity. It must, of course, be admitted that for ease of working, so far as relates to the clearing of the image from the superfluity of ink, the extreme of opacity and clearness in the negative is desirable, though it does not always conduce to the best result, such conditions being found to favour the production of a less delicate transfer, and to increase the difficulty of transferring. Perfect clearness of line with absolute density in the whites, so often insisted upon, is but rarely accomplished unless the drawing is exceptionally good. When copying good prints the operation is easy, but with drawings it is rarely found that *all* the lines are sufficiently black to yield clear glass in the negative. If, then, some lines are not clear, but yet can be reproduced in printing ink, it follows as a matter of course that perfect clearness is not a *sine-quâ-non*. In such cases it will also be found that faint lines are more difficult to reproduce when the ground of the negative is quite opaque, so that the best negative is one that still preserves a considerable amount of transparency in the silver deposit, combined with extreme clearness of line. The quality of perfect clearness in the lines is not essential, though desirable, for lines possessing a considerable amount of deposit may be brought out so long as they are combined with a sufficient amount of opacity in the ground. The really essential matter is to have a sufficient amount of contrast between the lines and the ground; that given, a successful transfer can be got by judicious exposure and other manipulation. If the lines are perfectly clear, there will be no difficulty about determining the amount of exposure, but when they are veiled the exposure must be increased in a greater degree than might at first be thought to be necessary.

As to what constitutes clearness, opinions vary. A negative may be bright enough looking when held up against the light, and yet may seem strongly veiled when laid upon a piece of white paper. This latter way of looking at it will indicate to an experienced eye how much exposure to light it will require to be efficiently printed, while looking *through* it, at the sky, for instance, will enable one to form a judgment as to how much may be given short of spoiling a transfer.

W. D. Richmond.

(*To be continued.*)

* The very earliest experiment made by the writer were some years before with the chromotype of Robert Hunt, which was founded upon the bichromate process of Mungo Ponton.

PHOTOGRAPHERS' LEGAL RESPONSIBILITIES.

Any one would have imagined that, considering the vast importance of the subject, and in view of the able editorial and exhaustive article which appeared in The British Journal of Photography of April 27 last, together with a reprint of the Act in respect to the provisions of the new Copyright Act in so far as affects photographers and their works, would have at once called forth some expression of opinion as to the very grave responsibilities which the said Act brings to bear upon them.

We find, on carefully perusing Section 7, that it most distinctly states that no person is entitled to affix, or cause to be affixed by any other person, the name of any one unless they are the actual producers of the finished photograph in its entirety, and that the mere fact of having taken the original negative from which the photograph is subsequently reproduced does not entitle the negative-maker to affix his name to the finished photograph; and thus the practice which has hitherto been in vogue of sending out photographs on mounts, with a name and address affixed other than that of the actual producer or finisher, involves a serious breach of the Act, subjecting the offender to heavy penalties on conviction before the magistrates. Moreover, when a photographer engages the services of an artist or portrait-painter to execute certain painted work for him, the photographer has no right to have his name in any way affixed to such finished work, and the so doing would involve a breach of the law, and subject him to serious penalties recoverable by the courts of law.

Too great stress cannot be laid upon this most important fact,

should any photographer unfortunately find himself the subject of a prosecution under the provisions of this or any other Acts of Parliament, that an attempt to plead ignorance of such matters will be of no avail, as the law does not relieve any one of their responsibilities by reason of such ignorance.

With regard to your remarks anent the Act, that, had Lord Monkswell's Bill been passed in its entirety, a special proviso had been inserted in reference to the finished work of *employés* that had been paid for by employers, the House of Lords Committee, in striking out that portion of the Bill, used a most wide discretion, as, if that had become law, it would have been the means of opening the door to fraud, as there would have been nothing to prevent any dishonest or fraudulently disposed person from purchasing good photographs or obtaining them from highly skilled operators, and passing them off as their own productions. And it must also be borne in mind that the substitution of any name for that of the original producer, is a very serious offence under the provisions of the Trades Marks Act, and that the offender renders himself liable to severe penalties.

I would also call the attention of the many readers of your valuable paper to the fact that there is little doubt that all photographic establishments, where more than one person is employed in addition to the proprietor and his wife, come within the scope and meaning of "The Factory and Workshops' Regulation Act," and that it is absolutely incumbent upon all proprietors, managers, &c., to have a copy of the said Act displayed in such a place as to be seen and read by their *employés*.

It is a known, yet regrettable, fact that there are some photographic employers who have very crude ideas and notions of their own as to their legal responsibilities in the matter of paying their assistants' wages, and it must distinctly be remembered that, where assistants are engaged on a weekly wage or salary, it is totally and utterly illegal to stop money from such weekly wage, &c., either for holidays or abstention from work caused by temporary illness, and that all such moneys that may be stopped are recoverable by the assistant by County Court procedure, and, where it can be distinctly proved by medical certificate that such illness is caused by the insanitary or dirty condition of the employer's premises, workrooms, &c., the cost of medical attendance, &c., can also be recovered from the employer by the same legal process. Your readers would be well advised to remember this, that, although the Factory Inspector under the new Act has not yet paid them a visit, it does not necessarily prove a valid exemption from the provisions of the said Act of Parliament, and also it has already been decided by the courts of law that the non-using of steam power does not constitute a valid exemption.

It is a matter of some importance that at present there does not exist a trade society in connexion with photography, whose interest it would be to supervise all these varied responsibilities of the profession, and, with a powerful and influential committee, would insist on all these and other legal enactments being properly regarded and enforced, to the credit and honour of the photographic profession.

PIONEER.

VIGNETTING.

[Anthony's Bulletin.]

By vignetting is commonly understood that method of printing by which the edges of the picture are made to pass gradually into the white of the paper. The more regular this gradation, the better vignette. The passing of the dark into the white should be even, without a break or line of demarcation to indicate in any way that the effect has been secured by the interposition of some object between the light and the paper. A properly made vignette is the most effective of photographs, while a poor one simply ruins any beauties that may be present in the negative. Landscapes do not lend themselves very readily to vignetting. Indeed, in the majority of cases a landscape vignetted is a landscape spoiled. By this we do not mean to raise any objection to the masking of parts or to the holding back of too transparent parts by means of vignetting, but refer to the practice of making an oval vignette from an architectural study or an interior. It is in portraiture that vignetting is largely used, especially in small work, cabinets and Paris panels. Two rules have been laid down, and they are certainly rules that we can recommend. When negatives are to be vignetted, dark backgrounds must not be used. The other extreme, white ground, must, of course, be avoided. The slightly tinted backgrounds, now so largely in use in this country, lend themselves admirably to vignetting. The second rule is that the vignette must not closely follow the outlines of the figure. Experience has led photographers to adopt two shapes of vignettes, the oval and the egg shape, the latter being used when it is desired to include the bust in the picture.

Vignetting may be accomplished in three ways; in the camera during exposure of the negative, by painting on the back of the negative, or by the use of vignetting glasses, papers or similar materials. Vignetting in the camera is but seldom used now. A short arm, coming from beneath the camera, carries an upright piece in which may be fixed in any position the vignetting screen. This may be a piece of cardboard, with an aperture of the desired shape cut in it. Being out of focus, no sharp edges show on the plate. For very soft effects the screen may be moved backwards and forwards along the short arm. This method has found but little application.

The production of a first-class vignette from a negative, the back of which has been painted, is not a difficult matter. The glass side of the negative may be dabbed with black varnish, leaving a space of the desired size and shape. The edges should then be thinned down by rubbing with a wash-leather pad soaked in turpentine. A far more satisfactory material is the paste known as Strauss marl. This is a thick paste which may be thinned by water, and which readily dries, and when dry does not come away in flakes. The back of the negative is pasted over with the marl, and the vignette washed out with water, the edges of the opening being thinned down to semi-transparency. The shape of this vignette can easily be changed and the whole backing readily removed by washing under the tap. The softest effects may be obtained by making a vignette with the paste on a piece of clear glass, and thus securing two thicknesses of glass between paper and vignetter.

Vignetting glasses were at one time in considerable use, but have very properly dropped from public favour. These are pieces of flashed ruby or orange glass, the colour being intense at the edges and gradually shading off to a transparent centre. A separate glass is required for every variation in size and shape, and adjustment is not an easy matter. Again, the gradation was not as soft as is desirable. A more effective device is a sheet of thin lead in which an aperture of the desired shape has been cut by means of scissors. The lead, being soft and pliable, is easily held in position by bending the edges around the printing frame. The edges of the aperture may also be turned back a little.

A very good vignetter may be made by tacking on to the frame a piece of cardboard in which a hole of the desired size and shape has been cut, and grading off the edges by means of absorbent cotton (cotton-wool) placed between the negative and the cardboard. Where this and the following method are employed the frame should be built up a quarter of an inch all around, so that the vignetter shall be well removed from the paper. Should a more sudden blending of the dark drapery be desired, the strip of wood on that side of the frame may be removed and the vignetter thus brought nearer to the negative. An easily made and at the same time a very effective vignetter is one which we believe to have been originated by Mr. F. H. Doyle, one of the demonstrators connected with the American Aristotype Company. A piece of cardboard is cut to the size of the printing frame, and an aperture somewhat smaller than the desired vignette is cut in it. The edges of the aperture are notched all around by scissors, except at the bottom. A sheet of pure white tissue paper is pasted over the whole. Thus far there is nothing new in the vignetter, this form having been in use for many years; but, by means of a very simple addition, a variety of effects may be obtained. This addition is a piece of opaque paper folded along its length, one side of the fold being pasted on the cardboard so that the hinge falls along the bottom of the aperture. If now it is desired to make an abrupt line across the bust, the loose fold is bent at right angles to the cardboard, and prevents any gradation by arresting the light. For a full vignetting the fold is bent back out of the way. Any intermediate gradation may easily be obtained by varying the length of this loose fold.

Vignettes on a tinted ground are made by removing the vignetted print from the printing frame, covering with a sheet of glass, protecting the printed portion with a piece of opaque paper, and exposing to diffused daylight until the desired colour is obtained.

"NEGATIVE" NOTES.

[Photographic Scraps.]

It has long been the custom for certain photographers, who date their acquaintance with photography back to that halcyon period usually referred to as the "good old wet-collodion days," to lament the decadence of the "good technical negative" of that period, and to speak in disparaging terms of the gelatine negative of the present day. Now, my own experience carries me far into the wet-collodion era, but I certainly do not share in the pessimistic view of the degeneration of technical photography which has lately been advanced in certain quarters. Doubt-

ess more bad negatives, and, consequently, bad photographs, are brought nto existence now than were produced in a similar period twenty years ago, but the fact must not be lost sight of that, where one person practised photography in those days, a hundred do so now. The trite remark met with in every text-book, that "a negative is merely a means to an end," need only be borne in mind, and a comparison made between some average work of the present day and that of, say, twenty years ago. Take, for example, the show-cases or albums of any well-known photographer who has been in business during the period to which we have referred. Do we find any marked deterioration in the quality of the work exhibited, as compared with that produced at a time when wet collodion was at its zenith? I think, if the question be fairly and candidly answered, the reply must be a very emphatic negative, and not only so, but that the further admission must be made that the average quality of the work has very greatly improved. Indeed, I venture to think that few of our leading photographers would care to place in their reception-rooms the work of twenty years ago, or to stake their reputation upon it, and this quite apart from the changes which fashion has undergone since then.

So much for quality; but it is further alleged that the permanence of the modern photograph is in jeopardy, by reason of the thin negatives of the present day permitting only of a superficial reduction of silver in the sensitive paper. But, even were this true, a faintly impressed image upon a properly produced gelatino-chloride paper would probably prove more permanent than a more deeply printed one on albumen. It is further, and, I think, erroneously, asserted that, because it is possible to obtain a more passable print from a poor and ghostly-looking negative upon gelatino-chloride paper than could by any amount of "dodging" be obtained upon its older rival, negatives of that character, or, I would rather say, want of character, are most suitable for the new process. Now, in regard to this fallacy, which to some extent has gained ground, it cannot be too widely known that the *finest* results upon gelatino-chloride paper are *not* to be obtained from this weak type of negative; on the contrary, a negative with good gradation and sufficient pluck to give a good print on platinum will generally yield the finest results on gelatino-chloride. If such a negative be compared with a wet-collodion negative of good quality, it will be found that the difference in the opacity of the high lights, although apparently great, is in reality very slight—a fact due to the superior non-actinic colour of the gelatine negative; but in the rendering of half-tone and shadow detail, in nine cases out of ten the latter will be found far superior to its older wet-collodion rival. This apparent lack of density is in a large measure due to the dissimilarity in the colour of the two deposits, and, if the development of the gelatine plate were pushed until the same visual opacity was obtained, the resulting negative would be practically unprintable.

It is, however, doubtless true that a large number of photographers, amateur and professional, continue to produce negatives of a quality leaving much to be desired, and, in the absence of opportunity for efficient technical instruction, this state of things is likely to continue. Indeed, the probability is that a great many people scarcely realise what the characteristic features of a good negative are, and therefore it is not surprising if, so working in the dark, they fail to achieve the success to which they might otherwise attain.

When I took up my pen to write this article, I intended to concern myself more with the production of the negative than a review of the present position of photography. I will, however, now devote a few lines to that always interesting subject, though what I shall have to say upon it is intended more for the beginner than the advanced worker.

To begin with, I am quite convinced that a good many of the failures beginners meet with in their negative-making is attributable to "flirting"—if I may use the expression—with half a dozen different methods of development. This kind of thing, to my knowledge, happens every day. A man exposes twelve plates; starts developing the first, we will say, with pyro; fails in getting the result aimed at, develops the next with hydroquinone, with a similar result; eikonogen, amidol, rodinal are then tried in turn, but the last negative proves no better than the first. Those who pursue such tactics should know that it is by no means an easy matter to *thoroughly* master the use of one particular developer; how much more difficult, then, to acquire a perfect knowledge of the peculiarities of half a dozen different ones at the same time? The same with regard to plates. A reliable brand should be selected, and no other used until a good negative can be made with tolerable certainty. There are not two different brands of plates in the market that, with precisely the same treatment, will yield the same result. Select a good developer, and use no other until you can with certainty produce just the kind of negative you desire, and then—well, if you are wise, you will not wish to make any further change. For quite another reason than that in the mind of the individual above referred to, I am in the habit of trying all the new developers, and suggested modifications of development, as they occur; but a very careful comparison of results, after a long series of experiments, leads me to unhesitatingly express the opinion that pyro has not yet been superseded—if, indeed, equalled—as an all-round developer for gelatine plates, although it may be conceded that, for special purposes, some of the newer substances may have advantages. It has been claimed for some of these that they possess the property of developing more detail out of under-exposed plates than would be possible with pyro; but those who have made these assertions have, I think, been misled by their greater rapidity of action. At any rate, the results of such comparative tests as I have been able to make, using each substance fairly and in such manner as to utilise its full energy, have been such as to satisfy me conclusively that no such superiority exists in fact.

To those who have a *penchant* for one-solution developers, amidol may be safely commended; it is, if duly restrained, simple to use, and, with fairly accurate exposures, produces a clean, bright-looking negative, but, be it noted, one that is very deceptive in its printing value. It is, moreover, a clean developer, and does not stain the film; this is the more remarkable when it is remembered how rapidly the solution oxidises upon very brief exposure to the atmosphere.

The simpler the developer is in its constituent parts the better. In this respect I doubt if all the experience of the gelatine era has enabled us to improve upon the simple solution of pyro, and another containing the accelerator with a due proportion of restraining bromide, which was suggested and used for the earliest dry plates.

I have always thought, and think so still, it is best to use the pyro dry, the only possible objection being the trouble involved in weighing or measuring out small quantities. This, I contend, in the case of any amateur, is not worth considering, though, to the professional, it is, doubtless, a more serious matter. In this case, however, the requisite quantity of pyro for the day's work can be weighed out, and the necessary quantity of water added, just before development begins. In this way we not only get the full energy of the pyro, but avoid stains and markings, and other troubles incidental to a "preserved solution" which has been kept some time. In regard to "preservatives," I think we are better without them, unless it be the addition of a small quantity of either citric or nitric acid. In fact, if it is necessary to keep the pyro in solution, one cannot do better than follow the instructions which are contained in every box of Ilford plates. It is simple and efficient; but, even then, although the solution will keep for months without oxidation ensuing, I consider it better not to keep it too long. Whether sulphite is used or not will depend upon the alkali employed. With ammonia it is not required, but with the fixed alkalies, on account of the greater tendency to yellowing of the film, it is found necessary. The difficulty is to obtain good samples, a certain proportion of sulphate and carbonate of soda being frequently present, neither of which are desirable additions to a stock solution of pyro. This difficulty, however, is avoided in the new Ilford formula, the sulphite being added to the stock alkaline solution, wherein it is, of course, perfectly harmless. Personally I always use ammonia and bromide of potassium kept separately in one-in-ten solutions.

The great fault with amateurs is under-exposure. I suppose, in the course of twelve months, I see as much of the work of "the young amateur," both his negatives and his prints, as anybody, and the cardinal fault running through the whole of it can be traced, in a word, to under-exposure. Particularly is this the case with two classes of subjects—portraits, and landscapes in which foliage predominates. In the former case the faces of the unfortunate sitters are staring white and absolutely devoid of expression, and the foliage in the latter is equally hard wherever it may happen to reflect a gleam of sunshine, and devoid of detail in the shadows. The remedy for these all-too-common errors is a more generous exposure and a slow development. Remember the oft-quoted adage, which, handed down from pre-gelatine days, is as applicable to our present day work as when it was first uttered, "Expose for the shadows, the lights will take care of themselves." Says one, "I have tried that, but I fog my plate." Yes, but why? Simply because the developer, with its full strength of accelerator, was applied at once to the plate. Most plates, I find, yield a better negative by reducing the pyro down to one and a half or even one grain to the ounce of developer. If an under-exposed negative, which has been flashed up by a developer strong in all its constituents, be compared with one produced on the indicated lines, the result will be a lesson from which the thoughtful photographer will learn more than he would from perusing pages of print. It should be borne in mind that the exposure must be sufficient to allow of the shadow detail being easily developed up by a normal or weak solution before the high lights have had an opportunity of becoming unduly dense, which, by reason of their having been so fully timed, they will not so readily do. Another reason—oh, dear! how many there are—why many fail to make good negatives is to be found in the unsuitable light in which they are produced. I do not mean on account of fogging—that is a fault quickly discovered and easily remedied—I mean spoilt by being developed in a miserably inadequate light. Too much light cannot well be used, provided it is of a suitable character. I often think I should like to consign the many messy, feeble, glow-worm arrangements, called dark-room lamps, which are often sold to amateurs, to the nearest dust-bin; they are the cause of more spoilt plates than anything else. For non-isochromatic plates, the use of ruby glass is, I consider, a mistake; nor do I care at all for daylight as an illuminant, it being so extremely variable in its intensity. I have long banished it from my own dark room, using, instead, a large, plain tin lantern, burning gas, in front of which, for ordinary work, is a screen composed of two thicknesses of canary fabric. I never fog even the most *rapid* plates, but I take the precaution to shield the tray with a cardboard cover until the image is well out. It is really astonishing how much even *actinic light* a plate will bear without detriment, provided *direct* rays be prevented from gaining access to it. As an instance, I

may mention that a professional friend has for many years been in the every-day habit of changing his plates by the light of an ordinary candle. This stands upon a high shelf, behind a large opaque cardboard screen, so that only reflected rays reach the plate. I do not hold this up for emulation, for there are, doubtless, many people who, so working, would contrive to hopelessly fog their plates, but merely to emphasise the fact of there being no necessity for the "groping-in-the-dark" methods which so many follow.

Among the minor matters—if, indeed, anything pertaining to the production of a negative can be so termed—I may mention the necessity for absolute cleanliness. It is difficult to keep dishes and glasses chemically clean by the mere application of water. In my own practice, when I have finished development, I well rub, both measures and trays, with a dilute solution (1 in 12) of hydrochloric acid; a thorough rinse then renders them chemically clean, and minimises the risk of all kinds of development marking and spots occurring, for which, generally, the poor plate-makers get the blame.

I will not attempt to define the perfect negative. I confess my inability to express myself clearly in words; it is easy enough to say that it must possess this, that, and the other quality, but the language is meaningless to the beginner. There must, of course, be a good range of gradation from highest light to deepest shadow, but the high lights must never be so opaque as to be devoid of detail, or to prevent a slight discolouration of silver paper when the proof is ready to be withdrawn from the printing frame, nor should the shadows be of what is known as the "clear-glass" type, spoken of so approvingly by some; the less absolutely clear glass there is in a negative, the better, probably, will its printing qualities be. Between these two extremes, the scale should be as long as possible. Let the photographer set himself a high ideal, and not rest satisfied until he has worked up to, or surpassed it, and never say, "It is good enough," when better might be done. Again, let him not fall into the common error of thinking that special kinds of negatives are necessary for particular printing processes. With very few exceptions, this is a fallacy put forward to excuse bad work. I sometimes produce negatives that do not print well on P.O.P. that give passable prints in hot-bath platinum, and fair ones in carbon; but my ideally perfect negative, for the production of which I am insisting, gives a better print in either or all those processes.

"Not very much in all this that we don't know," says one. To him I would retort, "Then, why so many bad negatives?"

JOHN A. HODGES.

FRANCIS BEDFORD.

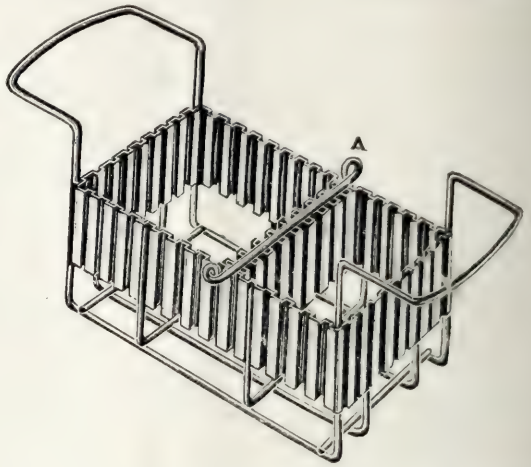
A VETERAN photographer, full of years and full of honours, has been "gathered to his fathers." Mr. Francis Bedford died at forty-five minutes past one on the afternoon of Tuesday, the 15th inst., at the ripe age of 78. His name has been associated with photography since its first practical inception, and it is scarcely saying too much to state that he was one of the most skilful landscape artists of which photography has been able to boast. In virtue of his great talent in this direction, he was invited to form one of the party selected to accompany H.R.H. the Prince of Wales on the occasion of his tour in the East over thirty years ago. One of the original members of the Photographic Society (now the Photographic Society of Great Britain), he has retained his connexion with this body up to the last, his place in its practical working having for several years been taken by his gifted son, William Bedford, whose demise we had to place on record sixteen months since.

The brief period intervening between the sad event and our going to press must plead our excuse for the curtness of this notice. The funeral of Mr. Bedford will take place at Highgate Cemetery (old burial-ground) at twelve o'clock on Saturday next. We feel sure there are many who would like to pay a last tribute of respect to the deceased.

Our Editorial Table.

THE VORTEX PRINT AND PLATE-WASHER.

MESSRS. SHARP & HITCHMOUGH, of Dale-street, Liverpool, have recently introduced the Vortex Print and Plate-washer, for which many advantages are claimed. Among these may be enumerated that of its action, being perfect with less pressure than with other washers. There is no sudden rush of water by the inlet pipe to damage the prints, which have a steady rotary motion. The rotary motion of the water attracts the hypo to the centre, whence it is withdrawn by the agency of a syphon. Having an all-round outlet, suction to one point is avoided, and the prints are thus prevented



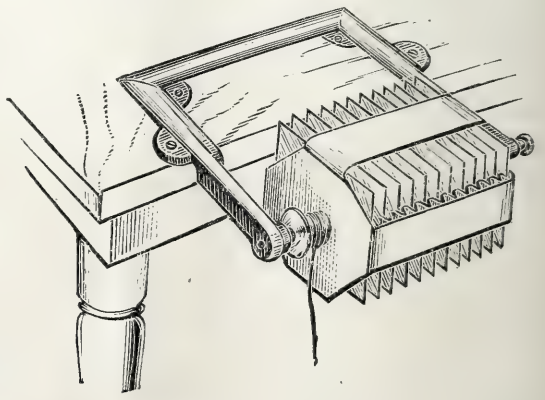
from sticking to the side, or from being washed over the top. The washer is well made of zinc, enamelled inside and out, and should be



effective in use. The plate rack, as will be observed, is adapted to take various sizes of plates by means of two tension screws on the sliding portion marked A. The combination of print and plate washer, which the Vortex supplies, makes it a useful adjunct to the photographic workroom. In addition to being well made, it is cheap

PUMPHREY'S PLATE-DRYER.

THIS device for enabling plates to be dried with great rapidity emanates from Mr. J. Pumphrey, of 132, Angelina-street, Birmingham. The principle applied is that of centrifugal force, the cage



holding the plates being made to revolve with great rapidity. To use the dryer, it is first securely clamped to a table or bench. The plates are placed in the respective grooves of the box, one of the lids as shown, holding them firmly in position. Now thread the cord

rough the eye in the bobbin shaft, and wind as closely as practible, leaving at least six inches unwound, so as to secure the uckles from damage; pull out the cord with a firm, persistent, ick action, and the box should spin for one and a half minute: thin a very short time the plates will be dried, and may be packed as required. This plate-dryer will be found a very useful instrunt on occasions when negatives or transparencies are wanted for e as soon as possible after development.

News and Notes.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, May 22, eight p.m.—*Tone Etching on Copper*, by Mr. Henri Calmels, who will give lemonstration of the process.

FALLOWFIELD'S *Photographic Remembrancer* for end of May contains drawgs and price lists of cameras, tripods, retouching appliances, hand cameras, ckgrounds, and other things necessary or useful to the photographer.

SUN AND SHADE CAMERA COMPANY write: "Kindly permit us to correct e following slight errors in your notice of our camera, viz., the 'Fearught' is of better quality than the 'Dreadnought,' *not cheaper*. The earl' weighs thirty-six ounces *half-plate*, NOT quarter-plate, which draws e scale at considerably less."

IN the new edition (the tenth) of *Photography in a Nutshell*, printed for . Tylar, Birmingham, the compiler or editor, who prefers to be known as the Kernel," has brought it up to date as nearly as possible by the addition of w matter. The topics treated are so various that he must be a dull reader o does not find something among its pages in which he will feel an interest.

A GREAT advantage in the new catalogue (eleventh edition) of Messrs. Taylor, ylor, & Hobson's lenses is to be found in the fact that it is not alone a mere talogue, but it is interspersed with useful optical information, which no one n peruse without being much the better for it. Since issuing their former t, the lenses of this firm have been largely remodelled with the assistance of w glasses. Photographers of limited experience ought to carefully peruse articles on the Preservation of Lenses, How to Focus, and the Principles of ens' Action. This catalogue is posted free to every one who asks for it, l every one ought to possess a copy.

INTERNATIONAL PHOTOGRAPHIC EXHIBITION, ARNHEM, HOLLAND.—The ldersche Amateur-fotografen Vereeniging, of Arnhem, has, with a view to advancement of photography, decided to hold an International Exhiion as above, during which days the same will be open to the public tween the hours of ten a.m. to five p.m. from July 14 to 29, 1894, in the ge hall of the "Musis Sacrum." The various competitions will be arranged follows:—Class A, Professional Photographers (international): I. Portraits iginal); II. Landscapes, *genre* pictures, interiors (original); III. Enlargents and reproductions; IV. Transparencies and lantern slides. Class B, nateur Photographers, (*a*) juniors (juniors are those amateurs who have not obtained honours at former Exhibitions; seniors are those amateurs who ve been awarded honours at previous Exhibitions; should these, however, ly consist of honourable mention, they are not considered as such), tional): I. Landscapes, *genre* pictures, interiors, portraits, &c. (originals); Enlargements and reproductions; III. Transparencies and lantern slides. Seniors (national): I. Landscapes, *genre* pictures, interiors, portraits, &c. iginal); II. Enlargements and reproductions; III. Transparencies and tern slides. (*c*) Juniors and seniors (international): I. Landscapes, *genre* tures, interiors, portraits, &c. (originals); II. Enlargements and reproctions; III. Transparencies and lantern slides. Class C, Professional and nateur Photographers (international), only open to such as do not live thin the Province of Gelderland: Views of Arnhem and the neighbourhood. ss D, Professional and Amateur Photographers (international): Scientific otographs. Class E, Professional and Amateur Photographers (international): chanical reproductions. Class F (international), photographic apparatus l utensils: I. Exhibited by makers; II. Exhibited by tradesmen and nts. Mr. Alb. Kapteyn, of 82, York-road, King's Cross, London, N., is mber of the Committee for the United Kingdom, and particulars can be ained of Mr. G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of Delegates, held on dnesday, May 9, at 50, Great Russell-street, W.C., Mr. E. Clifton (Chairn) presiding. The Secretary stated that, on the application of its Presit, the Croydon Camera Club has been readmitted to Affiliation by the uncil, on the understanding that the subscriptions due from it were paid mptly.—A letter was read from the Hon. Secretary of the Photographic iety of Great Britain to the effect that the Council did not see their way to nt any further privileges in the matter of wall-space charges to members of liated Societies. A statement was made as to the financial result of the tures recently held upon *Colour Photography*, and a vote of thanks to Mr. ll was unanimously passed, together with a resolution to offer him an norarium for his services. A vote of thanks was passed to the Worshipful mpany of Cordwainers for the loan of their hall, to Mr. G. Scamell for the rtion of his influence in securing the same, and to Sir Henry Trueman od for presiding on both occasions. The Chairman announced that Mr. ir Brown had promised a paper upon the *Uranium Toning of Bromide nts* for circulation, illustrated with examples; and Mr. S. Cecil Hertslet rth Surrey Photographic Society) promised to supplement same with a e upon the *Uranium Toning of Platinums*, also with examples. It was ided to obtain for circulation a set of slides of Rejlander's pictures. Mr. F. A. Bridge (Photographic Club) stated that his Club had instructed their delegates to suggest the advisability of the Committee getting together information with reference to dark rooms, objects of interest in various countries, and how permits to photograph same, where necessary, might be obtained, together with other information likely to prove useful to the members of affiliated Societies when touring, to be published in pamphlet form. The Secretary was instructed to communicate with the delegates of the Societies, and get same together. A letter, which had appeared in the photographic press, signed by the Hon. Secretary of the Leytonstone Camera Club, was read, and it was decided to defer its consideration until such time as the delegates of the Leytonstone Camera Club be present.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—Meeting of Committee, May 3, Mr. A. Mackie in the chair.—*First application* considered was an application from a photographic assistant who had been out of work over a year, and who had been receiving temporary assistance from the Association all through the winter. It was decided that, as he still seemed to have no prospect of work, and as the funds were low, the Association must refuse further assistance. *Second application*, a country professional, who had been twenty years in business, but who had been obliged by the severity of the winter depression and illness to pawn most of his apparatus and other belongings, and applied for the loan of 2*l.* to redeem one lens, and to obtain plates, &c., to execute work for which he had orders. The Secretary was instructed to make the loan if references proved satisfactory. *Third application.*—For grant to photographer's assistant who had been many months incapacitated by illness. The case was an urgent one, and the references perfectly satisfactory, and the Secretary had advanced 2*l.* This was confirmed, and the Secretary was instructed to make further grants as might seem necessary. (Since the meeting the Secretary has received notification of the death of this applicant from consumption. The last few comforts were bought out of the small amount advanced by the Association.) *Fourth application.*—From a trade printer and enlarger, who applied for assistance in temporary necessity, arising from long illness of family. The Secretary reported that he had asked for references, but had received no reply, and was instructed to take no further action pending further application. *Fifth application.*—From an outdoor photographer who had been in the profession forty years, and was now seventy-six years old, for a grant of 7*l.* to pay off small debts and obtain necessaries for the summer work. Excellent references had been received, and the sum granted. The Secretary reported that a woman photographer had come to him since the last meeting with introduction from one of the subscribers; she had walked several hundred miles in search of work, and asked for small temporary assistance and certain information. The Secretary had given the information and advanced 2*s.* 6*d.* That action was confirmed. The Secretary reported an offer to arrange a dramatic performance, probably of *Sweet Lavender*, in aid of the Benevolent, during the autumn, and was instructed to invite the gentleman making the offer to the next meeting of the Committee.

RECENT PATENTS.

PATENTS COMPLETED.

IMPROVEMENTS IN APPARATUS FOR CALCULATING PHOTOGRAPHIC EXPOSURES. No. 10,617. GEORGE FREDERIC WYNNE, Minera, near Wrexham, Denbighshire.—*April* 14, 1894.

THIS invention relates to an improved apparatus for calculating photographic exposures of that class in which the light is first tested by an actinometer in the usual manner, and the photographic exposure deduced therefrom.

The duration of exposure required for a photographic plate is affected by four conditions, namely:—

1. The actinic value of the light.
2. The character of the subject.
3. The ratio of the diaphragm of the lens to its focal length; and,
4. The sensitiveness of the plate used.

In other forms of calculating instruments hitherto used, these four factors have been calculated for separately, and a specially divided circular slide rule has been provided for each factor, and, when the resulting exposure has been shown by the instrument, it has only given the one exposure for the particular assumed values of the factors.

My improved calculating instrument is preferably made in two forms.

In one it consists of a cylindrical box, the lid of which is made so that it can be turned round upon the body of the box by means of a milled edge or other suitable device.

The periphery of the box and lid are divided geometrically preferably, into two scales, namely, a scale of the diagram numbers of plates employed (as hereafter explained), which are ascertained from actual test, and a scale graduated in the same ratio of the exposures in seconds. The circular box also serves as an actinometer for measuring the actinic value of the rays of light by noting the time which a strip of sensitive paper contained therein takes to darken to a standard tint.

In the second form it comprises a flat slide rule, having an actinometer secured on the back thereof. This latter is formed preferably of a circular box, having a rotatable lid, with an opening of suitable shape, provided with a disc of standard tint. The box is furnished with discs of sensitised paper, and these discs are prevented from rotating in the box (when the lid is turned) by being provided with lips engaging in slots in the box, the lid being rotated to expose fresh surfaces to the actinic rays of light. As the actinometer for this arrangement has not to carry any scales, it is designed in this form, and is much more compact than the box arrangement before described, in which a slip of sensitive paper is pulled through a slot in the usual way. The slide rule aforesaid is divided geometrically into two scales, similar to the scales before described upon the circular instrument, the scale of the diaphragm numbers of the plates being upon the rule, and the scale of exposures in

seconds being upon the brass slide (or *vice versâ*) enables the computation to be made mechanically.

The speed of the plate, instead of being expressed by an arbitrary number, may be expressed by the size of diaphragm through which a plate of that particular speed would require the actinometer time for its correct exposure upon a normal subject. The more rapid the speed of the plate, the smaller would be the size of its corresponding diaphragm, and *vice versâ*.

The unit of plate speed or speed No. 1 is calculated as the speed which takes (for a normal subject) the same time for exposure of a photographic plate of this rapidity through a standard diaphragm the diameter of which is equal to the focal length of the lens divided by four that the sensitive paper in the actinometer takes to colour to a standard tint.

It therefore follows that the comparative speeds of any plates of different diaphragm numbers are represented by the uniform standard numbers (of the Photographic Society of Great Britain) which correspond with the *f* numbers of the plates compared.

The unit might obviously be calculated with reference to any other diaphragm, but *f*·4 is preferred, as it is usually the largest stop employed in general photography, and is also the unit of the uniform standard numbers of the above-named Society for the comparative areas and duration of exposure of all other stops. It follows from this that the figure which represents the speed of the plate also represents the ratio of plate exposure to actinometer exposure for this standard diaphragm, called *f*·4. It is obvious that the uniform standard numbers might be engraved upon the scales against the corresponding diaphragm numbers in order to show the actual relative speeds of the plates; but, as doing so would not in any way affect the resulting calculation, and would make the instrument more complicated, it is preferred to use only the *f* or diaphragm numbers.

The diaphragms on the scale of diaphragms are graduated from the largest to the smallest in exactly the same proportion as the seconds scale, and in such a manner that, when the instrument is set correctly for one diaphragm, it is at the same time set correctly for all diaphragms from the largest to the smallest.

To calculate an exposure, therefore, for a normal subject, it is only necessary to set the actinometer time on exposure scale against the diaphragm number of the particular plate used, when against each diaphragm will be found on the same scale the correct exposure for that particular stop.

For exceptional subjects, which require a longer or shorter exposure than the normal, instead of having a separate scale for calculating the variation from the normal exposure due to the subject, it is only necessary to move the slide a certain number of divisions higher or lower than the normal position, according to the amount of variation required, and calculate as at this higher or lower figure.

It will thus be seen that, by the particular construction of the instrument and arrangement of scales, this one scale of diaphragms represents in itself three factors of exposure, namely, the sizes of diaphragms, the speed of the plate, and the variation of exposure due to special subjects, and that the exposure scale also represents both the actinometer time and also the exposure in seconds.

Instead of the scales being divided upon the periphery of a box and lid and upon a rule and slide as described, they might obviously be divided upon two movable concentric rings or discs.

Among the advantages of my apparatus are the following:—

a. The special scale or column of diaphragm numbers being progressively arranged, the one scale represents three factors of exposure, namely, the size of diaphragms, the speed of the plate, and the variations of exposure due to special subjects.

b. The special scale or columns of seconds and fractions of seconds being also progressively arranged, the one scale represents two factors, namely, the exposure in seconds and the actinometer time in seconds.

c. The special division and combination of the scales in such a manner that, in whatever position the slide is set, the corresponding exposure is shown simultaneously against each diaphragm from the largest to the smallest.

Improved Means of Automatically Locking Shutters of Photographic Dark Slides.

No. 9666.—William Frederick Fletcher, 60, Stanmore-road, Edgbaston, Birmingham, and Elisha John Bryant Danks, 1, Trafalgar-place, St. Mark's-street, Birmingham.—*April* 14, 1894.

An improved means for automatically locking shutters of photographic dark slides, so as to prevent any risk of exposing the plate a second time. It consists of two portions, the one being fitted to the body of the dark slide, and the other to the shutter. The portion screwed to the body consists of a plate of metal cut in such a shape as will allow a small arm being bent at an angle that will allow of it being parallel with the shutter of the dark slide, a loose arm, and coil spring, fitted on a rivet, in a manner best suited for the said spring to act on the loose arm, so that it will throw it forward when riveted to the small arm of the plate hereinbefore described. The said loose arm is cut in such a shape as to form two openings (on one side) of the most suitable description for the purposes hereinafter mentioned, the lower one being used for setting the lock, and the upper one for catching over the pin on the portion which is attached to the shutter.

The said second portion consisting of a plate from which a pin projects. The whole is made use of in the following manner:—When placing a plate in the dark slide, the shutter is slightly raised, and the loose arm pulled right back; the shutter is then pushed back, and the pin attached to same falls into the lower groove which is now held uppermost, and thereby holding back the said loose arm; it is now ready for use, and acts in the following manner, viz., on raising the shutter to expose the plate (when fixed in camera), the pin attached to shutter is drawn out of the lower groove, thereby releasing the said loose arm, which, acted upon by the spring, is thrown forward into position, so that, on again closing the shutter, the pin is forced into the second and upper groove, which is so formed that it acts as a lock, and thereby prevents the exposure of the plate a second time.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
21	Camera Club	
21	Leeds Photo. Society	Members' Lantern Evening.
21	North Middlesex	*Clouds in Lantern Slides.* S. E. Wall.
21	Richmond	
21	South London	*The Deterioration of Photographic Chemicals.* W. H. Sodeau.
22	Birmingham Photo. Society	
22	East London	*Enlargements.* J. H. Gear.
22	Great Britain (Technical)	*Tone Etching on Copper.* Henri Calmels
22	Hackney	*Combination Printing.* Jno. H. Gear.
22	Paisley	
22	Rochester	
22	West London	
23	Croydon Camera Club	Eighth Excursion leaves East Croydon at 11.28 for Horley.
23	Leytonstone	*Architectural Photography.* J. H. Avery
23	Photographic Club	
23	Southport	
24	Camera Club	
24	Glossop Dale	
24	Hull	
24	Ireland	
24	London and Provincial	
24	Oldham	
25	Cardiff	
25	Central Photographic Club	
25	Croydon Microscopical	
25	Holborn	
25	Maidstone	
25	Swansea	
26	Croydon Microscopical	Excursion: Ashtead and Esher.
26	Hull	
26	Leytonstone	Open Social Evening.
26	Liverpool Amateur	Exc.: Miller's Dale. Leader, F. Anyon
26	Oldham	Excursion: Middleton and Chadderton Hall. Leader, James Hall.
26	South London	Exc.: Carshalton. Leader, J. T. French

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 10,—Mr. R. Child Bayley in the chair.

The whole evening was devoted to a discussion of the resolution arrived at the previous meeting, relative to the distribution of Messrs. Haddon and Grundy's paper among members of the London and Provincial Photographic Association, as well as among other societies, and finally the resolution was amended by the excision of the portion relating to other societies.

PHOTOGRAPHIC CLUB.

May 9,—Mr. J. Howson in the chair.

Professor Stebbing, of Paris, who was present, said he had to pay thirty per cent. on plates into France from England. He was a member of the French Chamber of Commerce, and thought this duty should be taken off. The French plates made were on bad glass—bubbly, not flat.

The Chairman said the subject was a large one, and he trusted the photographic press would bring it before the public. He was of opinion that it was almost a hopeless task to make the English manufacturers retaliate, as they were so little affected.

Mr. Weir Brown was of opinion that it was also a hopeless task as well as a useless one. He would rather suggest an agitation be raised in France to lower the present prohibitive duty.

Mr. Frank Haes, with permission, asked Professor Stebbing if any inquiries had been made in Paris *re* the comparing of an alleged letter of Daguerre (with known writings) in the possession of the Club. The Club had not had a reply to its communications.

Professor Stebbing said he had not forgotten the circumstance, and was unaware that attention had not been given it. He would occupy himself with it on his return, and would report.

Mr. Halse asked Professor Stebbing if anything further had been done re the "International Union of Photography" with regard to labels which secured the contents of parcels from being tampered with by Customs authorities. He would like to ask if those labels were obtainable.

Mr. Tottem said the label was about 4×5 in size, and had a red star near covering it, with a simple sentence in four languages. He had used the labels considerably and with effect.

Professor Stebbing said he would endeavour to find out something about the labels.

Further discussion took place, and the meeting was of opinion that the subject was a serious one, and Mr. Frank Haes proposed that the Club Delegates to the Affiliation Committee should be instructed to bear the matter in mind, which Mr. Bedding seconded, and the motion was carried.

Mr. Halse showed a specimen tube of Forrester's caramel backing. Mr. Haes said he had used it with success.

Mr. Haes showed and described a filter which would, he thought, be useful to travelling photographers. The "candle," through which the water was pumped, was made of "keiselguhr," an organic earth.

Mr. Bedding referred to what Mr. Bothamley said at the Photographic Society's meeting on the previous night. He showed plates which had been kept about three years before development. He (Mr. Bedding) would like to ask if it was the experience of members that there was any difference in the latent image over a plate exposed and developed at once.

The Chairman showed two negatives which had been exposed two years before development. There was no apparent difference.

Professor STEBBING referred to collodio-bromide plates (unwashed emulsion), and was of opinion that the latent images on them deteriorated.

Mr. NESBIT confirmed the statement, and said he, on a summer holiday, had exposed plates, developing some at the time, which were good, and some a month after, which were not.

The Chairman showed two prints sent him from New Zealand. They were much faded. The photographer said they were toned with the combined bath (carefully prepared). He said he could not say much for the carefulness employed.

A discussion took place on *Combined Bath Toning*, in which Messrs. Weir Brown, Foxlee, and Howson took part.

Blackheath Camera Club.—At the Special General Meeting, held on April 25, Messrs. Walter Phillips and Stanley B. Earle, of Brantwood Lodge, Burnt Ash Hill, Lee, S.E., were elected joint Secretaries in the place of Messrs. Thomas B. Earle and C. Welborne Piper, who were reluctantly compelled to resign in consequence of being unable any longer to devote the necessary time to the secretarial work of the Club. At the same meeting Messrs. Thomas B. Earle and C. Welborne Piper were elected as members of the Council.

East London Photographic Society.—May 8, Mr. Wilkinson (one of the Vice-Presidents) in the chair.—Mr. LEBLANC, the representative of the Actien Gesellschaft für Anilin Fabrikation of Berlin, gave a demonstration on Metol-Andresen as an all-round developer. The lecturer exhibited an excellent travelling case for the developers and other accessories made by Stanley, of London Bridge, also some Sandell films and lantern slides, all developed with metol-Andresen, and prints from the negatives. After a few introductory remarks, a Castle plate negative, a Wratten & Wainwright instantaneous, and an Ilford bromide paper, were developed with the same solution, which amply authenticated the claims of metol as an all-round developer, the tones and gradations being remarkably fine, with an entire absence of stain or fog. The lecturer assured members that there were no deleterious effects from the use of metol unless there was a presence of caustic alkali in the developer, he having taken some on his tongue and also rubbed some in a cut on the finger with no injurious results following. Formula: A. Water, 1 ounce; metol, 6 grains; sulphite of soda, 60 grains. B. Water, 1 ounce; carbonate of soda, 50 grains; bromide of potassium, 1 grain. Equal parts, with one or two times water, according to exposure.

Hackney Photographic Society.—May 8, Mr. R. Beckett in the chair.—Samples of Edwards's isochromatic films were distributed among the members for trial. The report of the Society's outing on the previous Saturday to the river Roding was read by Mr. DEAN, and particulars were given by Messrs. T. H. SMITH and W. L. BARKER respectively of the forthcoming excursions to Burnham Beeches on the 14th inst. and Eynsford on the 19th. Mr. T. H. SMITH inquired the cause of two round patches of fog in the centre of two stereoscopic negatives. Opinions differed, but it was generally believed to be due to flare spots, caused by the use of single combination lenses. To cure this defect in lenses, Mr. BECKETT said that it was necessary to alter the position of the stop. [Mr. TYLAR, of Birmingham, then introduced the Hill-Norris dry-collodion plates, and read a paper, entitled *The Collodion Process, Past and Present.* In his paper Mr. Tylar dealt with the old wet-plate process, with its cumbersome and expensive impedimenta, and passed on to the first collodion dry plates, introduced in 1858. Their slowness, as compared to the great rapidity of the gelatine dry-plate, which was introduced soon afterwards, led to the decline of collodion for dry-plate purposes. The plates now on the market are the outcome of experiments made by Dr. Hill Norris, with the view of reviving dry collodion for negative work. They may be used with any developer, and possess all the recognised good qualities of collodion plates, in that they produce brilliant negatives, the film is structureless, and all the operations of developing, fixing, washing, and drying may be completed in less time than it takes to develop a gelatine plate. They are fairly rapid, requiring an exposure of two seconds at *f*-32 in a fair light, have good keeping qualities, great latitude, are isochromatic, and are free from halation. Dealing with the lantern plate, Mr. Tylar said it was the most rapid made, requiring about one-sixth the exposure of a Thomas's lantern plate. The correct exposure for contact is about eight seconds at one foot from gas flame with plucky negatives. Mr. Tylar demonstrated the working of the lantern plate, and produced a lantern slide in a very short space of time, the whole operation from the commencement of exposure to the final drying taking no more than five minutes. Some slides were then passed through the lantern to show the quality of these plates. Slides made on gelatine and collodion respectively were placed in the lantern for comparison, and those made from collodion were certainly more brilliant.

Holborn Camera Club.—May 11, Mr. D. R. Lowe (President) in the chair.—Mr. E. A. LEBLANC, representing the Actien Gesellschaft für Anilin Fabrikation Company gave an interesting demonstration with the various developers patented by Dr. Andresen. After speaking of the advantages of the different chemicals, he demonstrated with the metol developer, developing a Castle plate, a positive upon a Wratten plate, and a piece of Ilford bromide paper. He also passed round a set of negatives taken upon Sandell films. The simplicity of the developer, and the excellent work it performed, favourably impressed the members present.

Woodford Photographic Society.—May 3, The President (Mr. H. Wilmer in the chair.—The discussion on *Instantaneous Shutters* was opened by Mr. R. L. SOPER, who said that the most important qualifications of a good shutter were absence of vibration, lightness, range of exposure from moderately rapid up to one or two seconds. He showed several patterns of the Newman & Guardia blind shutter, explaining their action and fulfilment of the stated requirements. For very quick work under specially favourable conditions, the same firm's "Celeritas" shutter was shown, giving an exposure of one-five-hundredth of a second. In all the others, the variation in speed is obtained by an air brush. The SECRETARY preferred a shutter to be as simple as possible consistent with efficiency, showing two drop shutters and a Thornton-Pickard.

Bath Photographic Society.—An imposing list of excursions has been arranged by the Committee for the ensuing season, and on Saturday last the first of these took place. The party left the city by way of Warminster-road, reaching the summit of Stoke Hill by three p.m., when several views in this miniature Switzerland were taken, including the church with its Norman tombs. The next halt was made at Farleigh House, for a few more pictures. The brake then proceeded through Wolverton to Orchardleigh. Approaching along an avenue of well-kept timber, the imposing castellated entrance, dated 1623, was the popular subject. Thence through the extensive park, bounded by timber on one side, lake and heavy foliage on the other, the drive was continued for fully two miles ere the imposing pile of buildings, designated Manor House, was reached, the magnificence of which was in keeping with the grandeur of the numerous acres surrounding it. The sun shone in all its splendour, and the breeze was so slight that the near foliage was hardly perceptibly disturbed; added to this, the grounds were golden-tinted, owing to the great abundance of cowslips in bloom. An excellent tea was provided at the Red Lion, Wolverton, and a ten-mile drive over Wiltshire's western hills brought the party to Bath, well pleased with their first outing of the season. The excursion on June 2 will be to Beckington, Frome, and Stourton. The indoor meetings have ceased until October.

FORTHCOMING EXHIBITION.

1894.

July 14–29 ..... International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SILVER IN PLATES.

To the EDITOR.

SIR,—In my opinion, Mr. H. S. Starnes has done photographers a great service by his article in to-day's JOURNAL.

The contention that density is not directly related to the amount of silver in the film seems to be well borne out by his experiments. About three years ago I made an emulsion containing no more than thirty grains of silver haloid in six ounces, *i.e.*, about 3·3 grains to the ounce. I made two batches, which gave splendid density and fairly good gradation; but I failed to obtain such results in every subsequent batch. The failure puzzled me rather at the time; but, as I had other fish to fry, I allowed the matter to rest. Some time afterwards the same difficulty arose over some experiments in making a chloride paper, and this time I obtained an inkling of the cause. I was forced to somewhat the same conclusion as Mr. Starnes, but with this exception, that the organic matter of the developer, in my opinion, plays a very secondary part in giving density; and this is considerably more comforting when one hears so much of the fleeting nature of such stains.

I found, on the other hand, that the whole question of density rested with the gelatine, similar emulsions giving very dissimilar results in different gelatines. Once the right medium was obtained, one could obtain wonderful density with a small proportion of silver, even with a ferrous-oxalate developer.

I think this question of the gelatine employed is fully appreciated by plate-makers to-day. It is one which is constantly forcing itself on their notice.

Microscopical examination of the wet negative failed to afford any conclusive evidence as to the cause of the opacity, but the appearance of the silver deposit on a plate prepared with another sample of about the same speed, and containing twice as much silver, was strikingly different.

The size of the molecules of silver bromide seemed to affect the result very little, or at all, but it was very easy to determine a minimum amount of silver by the rapid loss of gradation.

Without accepting the dictum of either the phyicists or the chemists as to the nature of the light action in photography, it is not reasonable to suppose that it belongs to the phenomena of the borderland of all forces—the luminiferous ether. Such phenomena seem to be translated into chemistry, heat, &c., by mere accident, since we possess such a scanty knowledge of them or their laws.—I am, yours, &c., J. B. FINDLAY.

London, May 11, 1894.

TONING LANTERN SLIDES.

To the EDITOR.

SIR,—I don't think I have seen any mention of the following simple and certain method of securing fine tones (ranging from brown, through red, and purple to blue) on the ordinary commercial lantern plates. I

develop with plain ferrous oxalate (though I should think any clear working developer would do quite as well), taking usually about four minutes. I give a full exposure and get a thin slide, as clear as possible, but all detail in high lights present. Then, after thorough fixing and washing, I intensify with mercury and washing soda (ten per cent. solution). In the soda the plate tones rapidly and evenly. It will be found that any desired colour—brown, red, purple, or blue—can be obtained with unfailing certainty. I have used this method all the winter on the Mawson and Paget slow lantern plates, but no doubt any of the slow makes will do as well. I find it much pleasanter and more certain than the usual tedious method of long exposure and long development (fifteen or twenty minutes), in which some degradation of the high lights is almost certain to take place, and in which the tones vary each time. If the exposure should prove too short, the slide need not be lost. By developing at once to full density a good plate will still be secured, but, of course, of the usual black colour —I am, yours, &c. WM. HUNTER.

Cumnock, Ayrshire, May 12, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Knox burnisher for 12×10 prints, perfect. Wanted, quarter-plate rectilinear, or hand camera.—Address, HAROLD HOOD, Redcar.

Will exchange three dozen quarter-plate printing frames (oak), for head and body rest.—Address, R. OWEN, Photographer, Wrexham.

Exchange half-plate studio camera, lens, and studio stand, for good safety bicycle.—Address, A. BAILEY, 35A, Hindon-street, Pimlico, S.W.

Will exchange 5×4 camera, dark slide, half-plate lens, and tripod, for exterior background and three toning dishes.—Address, J. BENNETT, 9, Eden-road, West Norwood, S.E.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Blake & Edgar, Bedford.—*Photograph of a White Baboon.*

John Horsburgh & Sons, Edinburgh.—*Photographs of the Earl of Dalkeith.*

Stanley Hurst, Wrexham.—*Photograph of the Corinthian International Football Eleven*, 1894.

Charles Walker Clarke, Devizes.—*Photograph of a Water-colour Drawing of Market Place, Devizes, in the olden times.*

William G. Honey, Bath.—*Photographs of the Cork Street Preachers (South Mall Group), and the Cork Street Preachers, including the Marina and South Mall Groups.*

W. ETHELBERT HENRY.—We do not know.

C. RAY WOODS.—We have ascertained that it was duly forwarded.

N. A.; Enlarger.—These correspondents forward neither names nor addresses, hence no notice is taken of their communications.

T. T. T.—Any of the large photographic dealers will procure you that particular brand of collodion if it is still made. We have a strong idea it is not.

R. O. S.—Sixty grains to the ounce is not any too strong for sensitising albumen paper, which is salted with chloride of ammonium in the proportion of eight grains to the ounce.

J. W. R. M.—Pumice powder, or pumice stone, is the safest; dilute hydrochloric acid will also answer. Better avoid the stains by greater neatness in the manipulations in future.

PRECIPITATE.—The print—or the negative—appears to have been made through a lined screen, such as that used in the production of process blocks. Precipitate with sulphide of potassium.

STAINS.—The negative is now quite spoilt. The stains, in the first instance, were caused by insufficient washing between the operations of intensifying. Since, they have been made worse by the different attempts to remove them.

MEDIUM.—If ordinary water colour be mixed with albumen, instead of gum, it will not be removed in the burnishing of the prints.

T. RAY.—There is no harm in your trying, but you will certainly not succeed in photographing the *tableaux vivants* with snap shots with a lens of *f*-11, and the plates named. They can, of course, be photographed, but not with instantaneous exposures.

S. WHITMARSH.—There are methods of purifying methylated spirit, and also for making it of the strength of commercial absolute alcohol, namely, ·805 but the Excise authorities prohibit its being done. However, the processes, if carried out, would entail the use of a still to obtain the best results.

A. FROST.—Space is too limited in this column to give instructions for manufacturing photographic material on a commercial scale. However, practical details of albumenising paper will be found in the volume of the JOURNAL for 1884, and formulæ for sensitising it in the ALMANAC for the current year.

F. E. TURNER asks: "Can you tell me where I can get a book on the platinotype process, one that thoroughly explains it; also one on lenses, explaining the meaning of and how to find the focal lenths and all terms relating thereto?"—For the first get Pizzighelli & Hubl's *Manual*, and for the second get *The Optics of Photography*, published by Whittaker & Co., 2, White Hart-street, E.C.

A. W.—We expect you will have to refund some of the money, and also release the apprentice. That your business has been ruined by the competition of other photographers in the place we expect will be no excuse in a law court for not carrying out your part of the agreement, namely, to teach the youth the business. Persons, when they undertake responsibilities of this kind, are bound to carry them out.

SOUTH WALES.—The law does not specify that copyright photographs must be stamped or impressed with the word "copyright," hence you have been misled, and rendered yourself liable to the penalties under the Act if the party aggrieved likes to enforce them. Instead of treating the matter in the defiant fashion you seem to be doing, we should recommend you to adopt a reverse course, and make some amends.

S. C. T.—From your description of the apparatus we have no doubt as to what it is. It is a Johnson's pantascopic camera, which was introduced many years ago. As the name indicates, it is for taking panoramic pictures on a flat plate. Evidently, as you say, there are loose wires about it; the apparatus is somewhat out of working order. If you will send it to our office, we shall be pleased to advise you about it; that is, if you have any intention of taking it into use.

R. RAYNER.—There is no mountant that we know of that will enable photographs, on thick paper, to be mounted on thin paper in a book without a certain amount of cockling. A solution of gelatine, in which alcohol is made largely to take the place of water, is the best that can be employed. A solution of indiarubber is even better than the above, so far as the cockling is concerned, but then, after a time—often a short one—the rubber is liable to perish, when the print becomes detached.

H. B. S. says: "I have been asked by a lady to enlarge a cabinet of the Madonna with the Holy Child, but, before doing so, shall be greatly obliged if you can tell me whether I may do this without running any risk. I shall look up your answer in the JOURNAL. Thanking you in anticipation."—If the work in question be copyright, it will be illegal to copy it, and penalties will be incurred. There are probably hundreds of "Madonnas and Child" in existence, many of which are not now copyright, while others are.

GROUP says: "I have a group of some fifty or more persons to take shortly. The picture is to be twelve by ten, and taken on a lawn. I have a rapid rectilinear lens of eighteen inches focus, and also an old French portrait lens for twelve by ten portraits. The latter will be much quicker than the former, but does not cover so well. Which would you recommend me to use? I have had little experience with outdoor groups, or I would not trouble you on so simple a subject."—By all means use the rectilinear. It will be quite quick enough out of doors, as it ought to cover that size plate with nearly the full aperture.

W. W. H. writes: "I shall be glad if you will tell me the cause of my failure in making arrowroot and chloride printing paper. Is it an impurity in the paper, a sample of which I enclose? The following is the formula used:—Arrowroot, 15 grains; salt, 10 grains; water (distilled), 1 ounce, with which the paper is coated, and when dry sensitised with nitrate of silver, 40 grains; water (distilled), 1 ounce. I enclose resulting prints, which are all from the same pieee of paper, cut up after sensitising. One part of the paper prints all right, other parts as you see."—The trouble is due to the uneven sensitising. Either the salting is not evenly distributed over the paper, or the silvering solution is not evenly applied. The strength of the silver solution seems a little weak for the proportion of chloride; but the actual cause of one portion of the paper printing fairly well and the reverse is as indicated.

*** Several answers to correspondents, &c., are unavoidably held over.

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THE BRITISH

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XPOSURE AS INFLUENCED BY THE DEVELOPER EMPLOYED.

was one of the articles of belief of many of those who turned eir attention to photography in the earlier period of its stence that, given a sensitive surface—one in which the eparation was in "tottering equilibrium"—an image could impressed by the feeblest conceivable impact of a ray of ht, all that was necessary to convert this into a negative ing a developing agent having an activity sufficient to ferentiate between the various impacts, however feeble ese might be, and thus continue the action induced by ht.

Time has shown the correctness of this hypothesis, and a actical dogma that may be deduced is that, no matter what posure a plate has received, within certain, although wide, nits, it became possible, by the selection of a suitable reagent, develop a negative thereon.

It was the want of knowledge of the best conditions for velopment that necessitated the long exposures given by our notographic fathers, whose developer was gallic acid, from hich was afterwards evolved acid pyrogallol with silver trate. This change permitted a considerable shortening of ie exposure in the camera, but a vastly greater reduction as made when alkaline pyrogallol supplanted its immediate redecessor. Iron, too, whether as ferrous sulphate or ferrous alate, lent its powerful aid in the shortening of exposures.

Thanks to German chemical research, new developers, for hich specific advantages are being claimed, are now being shered in at frequent intervals. Although certain of these ave already achieved a considerable degree of popularity, yet nust they be considered as being still on their trial, and not as aving yet become classical.

One who is sufficiently well acquainted with the various evelopers can play with them, even when using the most nodern plates—that is to say, he can expose two plates lentical in make, giving one forty times the exposure of the ther, and still make good printing negatives of both. Of ourse, in the treatment of the longer-exposed of the two, he nust employ one of the long-since cast-off developers, that ind in which the image is in a large measure built up by the leposition of silver, instead of by the decomposition of the silver romide of which the sensitive coating is formed.

It would be the tritest of trite platitudes were we to say hat all plates—we mean those by different makers—will not, f developed by one and the same developer, necessarily produce equally excellent negatives; yet this truism is not adequately realised by every one. As a corollary, readily deduced from this, we may add, that different modern developers, those even the best of their kind, and acting under the same principle in forming the image, do not similarly affect the exposed plates to which they are applied.

We give an instance of this. The "Velox" developer of Mr. Cadett, as at first tried by us on two different brands of plates—the slowest of their kind—developed the image with great rapidity, but did not appear to have brought out any more detail in the finished negative than did an alkaline pyro developer against which it was tried. As the Velox had been claimed to practically shorten the exposure, we explained this result to the maker, who asked us to make another trial, using for the purpose a well-known quick brand of plate of his preparation. We did so, giving an exposure which we knew from experience was much too short to obtain a good negative with a pyro-soda developer. The plate was then cut in two, one half being treated with the Velox, and the other with pyro. The Velox developed a strong printing negative, dense, and full of detail; the pyro, after a protracted time, showed an image, but one ghostly in character, and so attenuated as not only to be worthless for photographic purposes, but to require the aid of the eye of faith in the essay to discover many of the details which were so well marked in the other half.

It is usually the case, that the more rapid the plate, the thinner and more lacking in vigour is the image obtained on it. This does not appear to be the case when the Velox is employed; at any rate, so far as we have tried it on these extra rapid plates, we have got all the density of deposit that was desirable.

Raising the temperature of the developer has long been known as equivalent to shortening the exposure. When we say "it has long been known," we mean that it was known in the earlier days of the art, when all kinds of expedients, this among them, had to be resorted to in order to reduce the time of exposure. We are not aware of any systematic attempt having been made to apply the principle to gelatine plates, although we have occasionally tried it on what were, some ten or twelve years since and in another country, designated "tropical" plates, from their having been prepared so as to resist the solvent action of hot water. With collodion dry plates, in the preservation of which albumen took a part, it has been found that hot development enabled the exposure in the camera to be reduced to more than a half of the time that would have to be given had the same developer been used cold.

The whole subject of exposure as influenced by the developer employed is one which might fittingly form the direction in which many investigations might be made by competent experimentalists during the camera season now opening, and we shall be pleased to learn that the attention of some has been directed into this line of research.

We have alluded to the activity of the Velox developer, and we may save some readers the trouble of writing to inquire as to its composition by saying that we are quite ignorant of it. It is a commercial production, is sold at a low price, and emanates from a firm whose *dicta* in matters of this nature may be unquestionably accepted.

A SIMPLIFICATION IN THE CARBON PROCESS.

Since the manufacturers of carbon tissue have supplied the material, in quantities to suit amateurs' and other small consumers' requirements, in a sensitive condition, carbon printing has received a great impetus, not amongst amateurs alone, but amongst professional photographers as well. Convenient as it is to obtain the tissue in small quantities, it oftentimes entails purchasing more than is required for immediate use, and, as it will not keep for more than two or three weeks, that means waste. Again, the ready-sensitised tissue, as supplied commercially, is, we are given to understand, prepared to suit negatives of an average type; but, as we pointed out a short time ago, with negatives of an exceptional character the tissue should be sensitised specially to meet their characteristics, and that must be done by the user himself.

The sensitising of carbon tissue under the present system is really a very simple matter, and entails but little trouble; but certain conditions have to be observed in the drying. For example, the room must be dark, and the drying must not be too prolonged, otherwise there is the risk of the tissue proving in the end insoluble. Hence the general run of dark rooms amongst amateurs are, by reason of their surroundings, too damp and too ill-ventilated for the purpose. The atmosphere of the room must also be free from noxious vapours, such as the fumes from burning gas, emanations from drains and the like, or the tissue may be rendered wholly or partially insoluble. Sometimes it may happen that this insolubility is so trivial that it may not be noticed in the manipulating, inasmuch as it is confined to a mere superficial layer, yet it will be sufficient to show as fog on the high lights, and thus destroy the purity of the whites. It has usually been recommended, as the best way to dry tissue in an extemporary way, to suspend it in a room in which a fire has been kept burning for some time and then allowed to die out; but it is manifest that the room must be kept darkened, which frequently entails inconvenience in more ways than one.

A novel though simple method of overcoming the above difficulties, while securing other advantages, has been devised by Mr. W. White, for which he has recently secured a patent, and it ought to make carbon printing still more popular alike with amateurs and professionals. By this system not only can the tissue be dried in any convenient place without injury, but the whole of the operations of carbon printing, from beginning to end, can be carried out in broad daylight, thus dispensing with the use of a dark room at any stage. The system is so exceedingly simple that it is surprising it was never thought of before. It is this: Instead of spreading the pigmented gelatine on white paper as hitherto, Mr. White uses either black or some non-actinic coloured paper, and dries the tissue, after sensitising it, in contact with some opaque material. Carbon tissue is practically insensitive to light when it is wet; hence it may, as most people know, be sensitised in the full light of an ordinary room, though it must be protected from light while it is drying.

Here is the new system in practice: The tissue on the coloured paper is sensitised in the ordinary way in the bich mate solution. When it is removed from the bath, it squeegeed face downward on to a sheet of metal, such as z or tin, or on to one of ebonite, a ferrotype plate, or a piece black xylonite. A sheet of non-actinic glass may also be us if preferred. Here we have the sensitive pigmented gelati sandwiched between two non-actinic media, consequently may be put anywhere most convenient to dry, even in t open air, for instance, without fear of its suffering inju When dry, the tissue is stripped off, and it will possess t same surface as that of the material upon which it was dri whatever that may be. It is then ready for use. If thoug desirable, the glass or metal plate may be coated with collodi before the tissue is squeegeed upon it, which will come aw with the tissue, and thus save the trouble of coating it aft printing, as is sometimes done in the production of tra parencies. Of course the pigmented coating is now sensiti to light, but it can be manipulated in an ordinary room if t simple precaution be taken to always keep it face downwa when it is immersed in water. After printing, it again becom insensitive to light.

There is nothing new in drying carbon tissue in conta with a glass or other plate, and in back volumes we ha pointed out the advantages and disadvantages of this meth of procedure. It will, however, be well in connexion with th subject to briefly recapitulate them here. The only disa vantage is that the drying of the tissue is retarded, as t moisture can evaporate from one side only, which is likely, some instances, when it is much prolonged, to conduce insolubility. But with the system now under consideratio this is of little moment, because, if the drying is found to pr ceed too slowly, it can be accelerated by placing the tissue a drier place, or in the open air—even in sunlight, if thoug necessary. The advantages are several. Here are some While drying, the surface of the tissue is completely protecte from dust. It is also secured against any noxious vapou that may be present in the apartment—no mean advantag The surface of the gelatine is also smoother, and the tiss itself is also flatter than when it is dried in the usual way, that intimate contact with the negative is better secured.

This novel and simplified system of working, if put int practice, ought to still further enhance the increasing pop larity of the carbon process, and we shall be surprised if does not.

UNIFORMITY IN DEVELOPMENT.

Dark-room Illumination.

Resuming our treatment of this subject at the point where w had shown how necessary it was, when aiming at uniformity o result, that the general effect of external agents or stimuli upo the eye should not be disregarded in estimating its power t gauge effects of greater or less depth in the negative, w conclusively showed that intermittent development, such as i portrait work is carried on by those who expose a plate in th studio and at once proceed to develop, is very unfavourable t obtaining the effect we are discussing; but, as this often is s much a matter of individual necessity, we will not dwell furthe upon it, but will at once take into consideration the illuminatio made use of in the dark room.

This must be looked at, firstly, as to the general lighting o the room, in order to perform the requisite manipulations— opening packets of plates, filling slides, preparing the de-

loper, and so on; and, secondly, the light made use of during e actual operation of developing. We have no intention of itiating a discussion on that vexed question, the most suitable lours for dark-room windows or lamp glasses; what we have say will be general rather than particular in this regard.

The first thing that will strike any one who refers to back mbers of this JOURNAL, to ascertain the opinions of various perts as there recorded, will be the very contrary series of vice given on the subject. If the subject be properly viewed, wever, this need cause no trouble. What has to be thought is, what effect, if any, the light has upon a plate when placed any of the positions it will occupy in the course of work, and r the usual duration of time. Thus it is useless in practice, hen ascertaining if a certain glass is "safe," to place a sensi- ve plate under it, with such a glare of light as would, under conceivable circumstances, reach it in every-day work. hat has to be done is to put a plate in the brightest place it ever likely to be placed in, and for the maximum probable me; if then it shows no fog on development, nothing more needed in practice, however unsafe an expert might pro- ounce it; and, as regards light fog, the results would be niform, for it would always be absent. If one source of light e used for development and for general lighting, it is obvious at the plate will be exposed to a great range of risks. Near ne light a brief exposure might fog, while at a yard or two way the plate might be safe when left unprotected for several inutes. For this reason it cannot be disputed that artificial ght has most preponderating advantages over daylight. When ne latter is used, even granting the absence of direct sun rays, ne actual strength of the light admitted may vary so as to be wenty-fold at one time its power at another. Hence the safety" limit would be difficult either to define or to discover. ut when one, or a series of artificial lights are used, whether as, or solid or liquid hydrocarbon, the illumination is virtually constant factor, and with uniformity of results in view, to- ether with the maximum of light consistent with safety, every rgument is in favour of the gas burner, or its analogue. When put to the test it is, further, very surprising what a omfortable amount of light may be employed without fog isks when the burner is suitably placed.

With regard to the light actually employed in development, t is needed first for a general illumination by reflected light, nd after, for particular employment to ascertain by trans- nitted light the density of the negative. Again does the uperiority of a fixed artificial light exhibit itself. How is it ossible, it may be asked, to get results comparable in depth hen the strength of the background of light may vary from hat of blue sky to bright cloud, four or five, or more, times as trong? If, however, the negative, when approaching the equired density, we held up for a second or two before a flame protected, of course, by coloured glass), the operator, other hings being equal, may be absolutely sure of the depth to hich its highest lights have arrived being subject to no loubtful verdict, granting, of course, sufficient knowledge of his ork for him to be capable of judging. This is a point of the ighest importance in getting a series of negatives alike in trength. Of course, photography is not a mathematical pro- ess, and judgment is always needed; but we would ask any ne who uses daylight for developing to run through a few core of his negatives, and see what proportion of over-thin or ver-dense ones he possesses, and then try to consider how nuch of this want of uniformity is traceable to a similar want n the illumination of his plates while developing. A gas or lamp burner or two, to light the room, and another for use in developing only, are most valuable aids to uniformity; they might almost be said to be essential; and we are sure that those who have once tried them and carefully arranged for the removal of the fumes, without contaminating the atmosphere of the room, will never desire to return to daylight. A further article on the actual processes of development will conclude the treatment of a subject of the greatest importance to work of the highest class.

Decomposition of Hydroxylamine.—Though, in the rush of new developing agents, we hear less of this substance *per se*, it yet has its advocates. It will therefore be interesting to note that S. Kolotoff, in the *Journal* of the Russian Chemical Society, has pointed out that, when kept in solution with caustic soda, it entirely decomposes. The solution experimented with contained six per cent. hydroxylamine and twelve of caustic soda, and was kept for several days at the ordinary temperature.

New Iron Salt.—Organic iron compounds are known to have an influence in wet-plate work in producing that most desirable quality in copying pictures, density. We therefore note a new salt which may possibly be valuable in that direction, the more so that sugar, which forms a constituent, has likewise a similar action. The new salt is made by pouring a solution of cane sugar and perchloride of iron in a slight excess of solution of caustic soda, a crystalline, reddish-brown powder being the result. It is soluble to the extent of about ninety-five per cent. in solution of cane sugar. Iron Sucrate is the name given to this new compound, and it is stated that iron maltosate may be made in a similar way.

Royal Society's Conversazione.—Among the exhibits at this important collection of all that is of recent interest in connexion with science were several photographs of novel character. Mr. W. B. Croft exhibited photographs of sundry diffraction phenomena—Newton's rings, reflected and transmitted; Fresnel's interference from a bi-prism; Arago's shifting of bands towards the denser medium; shadows of needles, wire gauze, perforated zinc, &c. Professor J. Norman Lockyer exhibited photographs of stellar spectra taken with a six-inch objective prism of forty-five degrees, and photographs of the great sun spot of February, 1894, taken at Dehra Dun. Almost the only object of importance connected with chemistry had photographic interest, namely, a number of bottles containing samples of gun-cotton, soluble and insoluble, made forty-seven years ago. They were shown by Mr. Gladstone.

Development of Orthochromatic Plates in Yellow Light.—At the last meeting of the Photographic Club a little discussion took place on the objection which some photographers had to the use of the ruby light in development, and its necessity with orthochromatic plates, the latter fact being alleged by a few workers as an obstacle to the use of colour-sensitive plates. Two or three speakers, however, pointed out that the yellow light could be employed with no danger of fog provided that the light be deflected in an opposite direction to the plate, which should also be shielded, the progress of the image being judged by examining it by the light reflected from the wall, &c. In this manner we have since successfully developed orthochromatic plates without fogging them. To the discreet and careful worker who may object to ruby light this hint will possibly be of service, although the unqualified recommendation of yellow light for the purpose is scarcely to be encouraged, seeing how many failures are already to be traced to the use of improper light in the dark room.

New Bünsen Burner.—A new mixed gas burner of the Bünsen type described in a recent issue of the *Scientific Ameri-*

can, which reports of it that "it may fairly be said to represent an important advance in laboratory appliances. The well-known inconveniences that the ordinary type are liable to, such, for example, in jumping down of the flame, smoky tip, and so on, are obviated in the new form, which seems likely to be soon an ordinary article of sale. It is difficult to explain without a diagram, but its main features consist in a telescoping brass tube fixed round a burner somewhat like the ordinary one, the tube having a diaphragm pierced with holes near the lower end. The atmospheric air required is drawn up through these apertures, and, by telescoping the outer tube, more or less, an exact point can be arranged to allow of the production of a perfect flame or one with any required peculiarity." In reference to the ordinary Bünsen, it may be said that the use of the short sliding tube with apertures is not always thoroughly understood, a smoky tipped flame or the jumping down can usually be obviated by adjusting the air supply carefully with this regulator. We have seen burners offered for sale in which this essential part of the apparatus is quite absent.

Sodium Peroxide.—Further interesting properties of sodium oxide are described in the current *Berichte* by Professor Poleck, of Breslau. It is shown that sodium peroxide rapidly reduces salts of gold, silver, and mercury, with separation of the metal and evolution of oxygen gas. Platinum, however, is not precipitated from chloroplatinic acid or chloroplatinates until they are decomposed with a silver salt, when reduction both of the resulting platinum chloride and of the silver chloride occurs, both metals being precipitated. Ferric hydroxide is precipitated, as might be expected, from both ferrous and ferric salts; from manganous salts manganese dioxide is precipitated, presumably hydrated; and, from salts of cobalt, the higher cobaltic oxide. Permanganates are reduced to manganese dioxide, but chromic oxide is oxidised to chromic acid. The separation and quantitative estimation of iron and chromium or manganese and chromium are easily achieved by utilising these reactions, for iron is precipitated as ferric hydroxide and manganese as peroxide, while chromium remains in solution as chromate of sodium. Sodium peroxide also produces the highly oxidised sodium peruranate, $Na_4U_2O_8+8H_2O$, directly from salts of uranium, and it may readily be isolated by addition of alcohol, which precipitates it. It is also interesting that iodine is oxidised on warming directly to the difficultly soluble acid sodium periodate, and upon decomposition of this salt with silver nitrate the normal silver periodate is at once produced, and free periodic acid HIO_4+2H_2O may be readily obtained from it in large crystals by decomposition with bromide and subsequent evaporation *in vacuo*. Potassium ferricyanide behaves towards sodium peroxide in a similar manner to its action with hydrogen peroxide, reducing it energetically to ferrocyanide, and the volumetric process of Kassner can be readily carried out by use of it. Sodium peroxide reacts with lead oxide in presence of water to produce a plumbate of sodium of the composition $Na_2PbO_3+4H_2O$. Organic compounds dissolved in alcohol are usually very rapidly oxidised by sodium peroxide, while the alcohol itself is not attacked. Ether, on the contrary, at once ignites when brought in contact with the peroxide.

HYPO ELIMINATORS AND GELATINO-CHLORIDE PAPER.

THE practice of using the so-called hypo eliminators for either negatives or albumen prints as a substitute for honest washing has always been decried in the pages of the JOURNAL, and wisely; but, if such practice is injudicious in the cases mentioned, how much more so is it in that of gelatino-chloride paper?

With the exception of alum, all the agents used for the purpose of decomposing the hyposulphites exercise a powerful softening action upon gelatine, but notably so the hypochlorites, and these, if applied to the already too tender surface of gelatine prints, produce an effect that can be easily imagined, and which is only excelled, if equalled, by a strong solution of ammonium sulphocyanide. For this reason we never hear much, if at all, of the employment of hypo eliminators, as such, with the new printing paper.

This is, no doubt, partly the case, because the washing required after fixing is so short as compared with albumen paper, some two or three hours only being the time generally recommended, the soluble salts being supposed to be removed from the gelatine film far more rapidly than from albumen, for some reason or other. Then the final application is a solution of alum, not, of course, in its capacity of "eliminator," but rather of "indurator," though, should any traces of hypo remain, it naturally performs both functions, and so forms, it is imagined, a double safeguard. But is it so?

In far too many cases it is only too probable that alum, carelessly and injudiciously employed, works more harm than benefit. The washing of the prints is slurred over and inefficiently performed, in the belief that the final alum bath will put matters right, whereas its use, in reality, only hastens and renders inevitable a catastrophe that might otherwise be long deferred, or altogether averted.

If any one doubt this, one or two simple experiments will convince him of the truth of what I say. First, let a gelatino-chloride print, that is known to have been well and thoroughly washed after fixing, be left to soak in a moderately strong solution of alum, such as would be used in the ordinary course for hardening purposes; the change that occurs in the course of a few hours will prove conclusively how undesirable an agent alum is to have lingering about a print.

Next, take a couple of prints that have been only half washed after fixing, that is to say, that have been passed quickly through several changes of water to take away the bulk of the hypo, but not allowed to soak; immerse one of these for two or three minutes in the alum solution, and then wash again, this time very thoroughly, in order that no free alum may remain to lay the subsequent blame. Put these prints on one side and watch the result. In the course of a few weeks, if not earlier, the alumed print will begin to turn yellow, and in a very short time after this commences it will present all the appearances of complete sulphuration, while meanwhile its companion remains perfectly unchanged. If the two prints be enclosed in a wide-mouthed bottle containing a little moisture, the change will be far more rapid, but precisely similar in character; the alumed print will be hopelessly destroyed before, perhaps, the other shows the least sign of alteration, although, of course, something will depend upon the actual amount of washing given after fixing.

This result bears out to the full what has frequently been said as to the danger rather than the benefit of hypo eliminators, which, as has been pointed out, introduce into the film, whether it be negative or positive—although the latter is likely to suffer most severely—decomposition products that are really more injurious than those they are intended to displace. In the case of gelatine prints, the effect is more rapid and more marked than with either negatives or albumen prints, probably for the reason I have mentioned, that the washing after fixing is comparatively shorter.

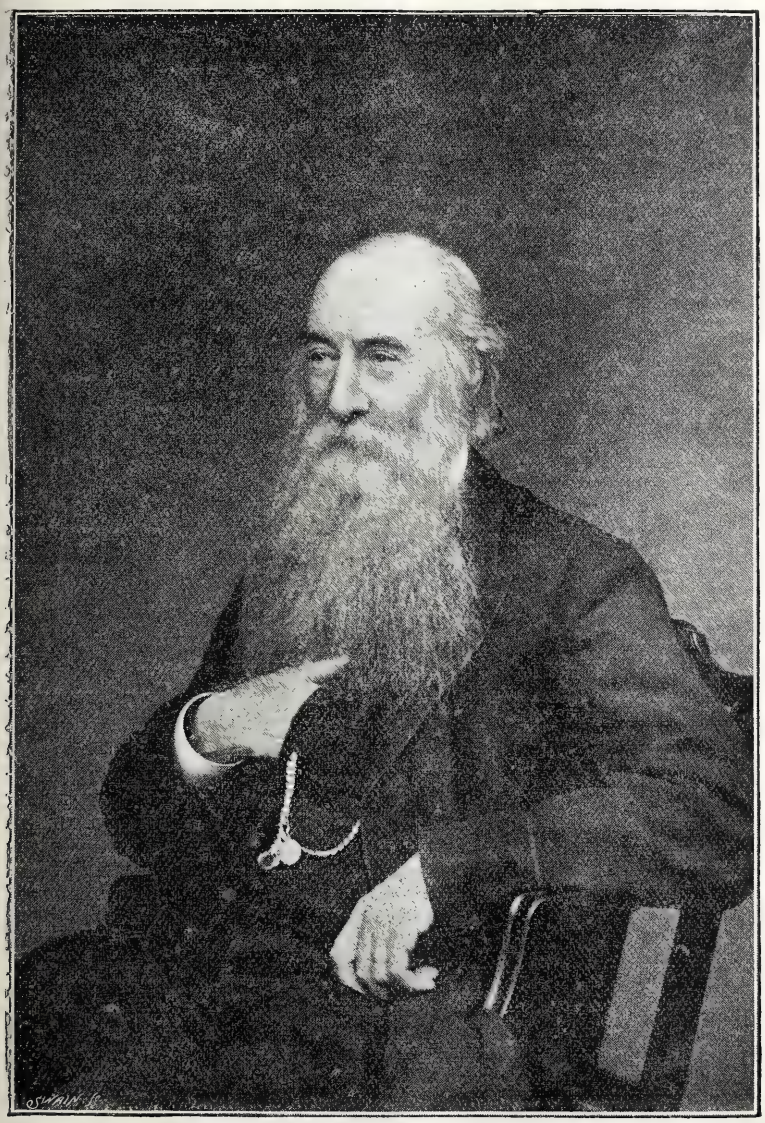
This raises another question, namely, if the washing usually given to gelatine prints is insufficient to remove the hypo salts, how is it the prints have any permanency at all? In reply, I do not mean to say that properly conducted washing for the period mentioned is insufficient, but it *must* be properly carried out. In the experiment I have quoted, the two prints are purposely insufficiently washed, and yet the unalumed one stands better than the other. This I take it to be because, if properly fixed before washing, there will be very little *silver* left in the prints, the bulk of what has to be washed out being hypo. This will not be the case if a large number of prints are crowded into a small quantity of solution for a minimum length of time, as then the action must obviously be incomplete. But if a fair volume of solution be used, and plenty of time allowed, the silver chloride will be not only converted into a perfectly soluble condition, but will, in great measure, be extracted from the film by the fixing solution itself, leaving the gelatine saturated with hypo, containing a comparatively small trace of silver, which is quickly removed in washing, or so nearly so that the infinitesimal proportion remaining is harmless.

Hypo may be left behind in appreciable quantity without doing much harm so long as the prints are kept dry and under such conditions as to avoid decomposition; but the very act of "eliminating" the hypo sets up that decomposition and does all the injury. Hence

I repeat that the use of alum is a danger, instead of a safeguard, and probably accounts for far more faded and spotted prints than many of my readers imagine.

Looking at the importance, or, I may say, the absolute necessity for hardening the surfaces of the prints before mounting, and bearing in mind what I have said about the danger of alum, it seems worth while to try other hardening agents in its place. Tannic acid has been recommended for negative purposes, and that substance, or gallic acid, might, I think, very well be pressed into service in conjunction with gelatine prints. I have tried the latter slightly, and find the only difficulty to be to avoid over-doing the action. Probably further experiments will overcome this.

In conclusion, it must not be assumed that I wholly condemn alum as fatal to gelatino-chloride prints; but, knowing what the average amateur is, I point out the danger. W. B. Bolton.



FRANCIS BEDFORD.

Died May 15, 1894.

CONTINENTAL NOTES AND NEWS.

More Lippmann Colour-Photographs.—On the 4th of the month, before the members of the Société Française de Photographie, M. Lippmann showed some new results by his interference method, produced by Messrs. Lumière. M. Vidal, who was present at the meeting, speaks, in *Le Moniteur*, in high terms of the pictures, and expresses regret that Mr. Ives was not present to inspect them. "He would have had to admit," says M. Vidal, "that the photochromoscope results could not be compared with Lumière's."

Simultaneous Development and Exposure of Bromide Enlargements.—To obviate the difficulty of determining the exact time of exposure of bromide enlargements, a correspondent of the *Wochenblatt* recommends that, before exposure, the surface of the sensitive paper be treated with a developer incorporated in glycerine. The growth of the image after or during exposure can then be watched and arrested at the proper depth. Subsequent development may be resorted to for modifying the character of the image.

Perforated Developing and Washing Trays.—In the *Revue Suisse* there appears an illustration of a washing tray, two of the sides of which are perforated in order that the wash water may be removed without, as is frequently the case, the prints, also leaving the receptacle.

Identifying Dry Plates.—A recently established firm of dry-plate makers at Dresden has adopted the idea of marking the sides of their plates with the name of the brand, the inscription, whatever it may be, being invisible until brought to light by development.

Worthy of Imitation.—The Austrian Finance Minister has instructed the Custom House authorities of his country not to open boxes of sensitive plates except in the presence of the owner, and then in a suitable place.

The Combined Bath *v.* Separate Baths.—Dr. Liesegang is alleged to have said that gelatino-chloride prints toned after or during fixation are, all other things being equal, more permanent than prints toned before fixation. He deduces this from the circumstance that the dissolution of the unaltered chloride of the prints by the hypo allows of a more complete deposit of gold than would be possible in the unfixed print.

Zinc as a Precipitant for old Toning and Fixing Baths.—Dr. Strebel suggests the employment of powdered zinc for precipitating the gold or silver from old toning or fixing baths. The bath solution should be alkaline, neutral or feebly acid, two to three grammes of powdered zinc per litre added, the mixture agitated, and then left for ten minutes or so, when precipitation will be complete.

SOME PRACTICAL EXPERIENCES.

Single Lenses for Architecture.

In illustration of the following remarks upon the above subject, I have sent to the Editor two photographs, which he will, no doubt be pleased to show to any one interested enough to call upon him Premising that I wish to pose not as a mentor, but as a pure narrator of personal experience, it may at once be stated to be one of the most remarkable instances of technical superstition that, under the impression that they are unsuitable, single lenses are virtually ignored by the large majority of workers for general use, and especially for subjects where architecture forms a main feature. I hope to show what a mistake this is, and how much "lens power" is thus allowed to run to waste. Almost every photographer in these days of cheap lenses works with a lens of the symmetrical or rectilinear type, the former term being rather a misnomer, seeing that in the quicker types the back and front combinations are not similar, though, for the purposes of this article, this dissimilarity may be ignored. It is, of course, no news that the separate halves of one of these lenses may be used as a single landscape lens; what it is desired to explain is that this is only half a tale, for, under certain restrictions, they may be used for all the purposes that the double lens is made to sub-

serve—indeed, under particular conditions, for all, except mathematically accurate rectilinear delineation. The usual conception of the power of the halved lens is that it is all very well for landscapes, but that for buildings it is bound to give curved lines. Here, gain, we have a half truth only. Certainly it may be made to give curved lines in lieu of straight, but equally certainly it does not of necessity do so.

The divided lenses will necessarily vary in the degree of restrictions to be applied to their use, but under the circumstances of every-day work little trouble need be apprehended. How they can be utilised is capable of simple explanation. First, let an ordinary lens of rectilinear type have its front combination unscrewed and put aside, and then the image viewed upon the ground glass. If the lens had been focussed in the first instance, an indistinct image only would be seen after the alteration, because the remaining one has, roughly speaking, about double the focus of the original lens, and the diaphragm in use, if allowed to remain, will be increased in light-reducing power in an equivalent manner, that is to say, the square, or fourfold. Hence the image will appear darker. That will be the main change. Let us suppose that a 10 × 8 camera is being used, and a ten-inch focus lens (as a general rule, for a one-lens worker a twelve-inch lens would be a preferable one for such a size of plate). Let the camera then be pointed to a building, and the image examined. It will, with most types of instrument, be impossible to detect any deviation from strict rectilinearity; there will be none of the expected curved lines; the image will be perfect. Next, let the same half lens be removed and placed in a large camera capable of containing a twenty-inch plate. Then, indeed, we shall, in the first instance, observe curved lines instead of straight; next, the brilliancy of the image will rapidly die away almost to darkness as it approaches the margin of the plate; finally, the whole of the twenty-inch plate will, in all probability, not be entirely covered by any image at all, but will be contained in a circular disc at greater or less distance from the margin as the lens hood is long or short. In this latter instance—a large field to cover—lies the whole crux of the position. The half lens is only useful for a limited portion of the field it covers; but then when a lens is so halved, when a day's work is in progress, it is only used in the one camera, and that camera itself, by reason of its dimensions, so sufficiently restricts the field as to confine it to the useful portion. The hypothetical ten-inch focus lens converted into a twenty-inch will, except in the extreme corners of the plate, produce a perfect image of any building, or even interior, it may be desired to use it upon. Thus, in going for a day's photographing with a ten-inch lens, if one comes across a building that, when viewed upon the ground glass, is far too small, all that is necessary, so far as the glasses are concerned, is to remove the front lens and use the back, thus reducing the weight to be carried—a very important consideration, very much lessening the cost of an outfit.

The same reasoning will apply to lenses of shorter focus. The exact safe limit will vary according to the construction of the lens, and one inspection of the image will once for all acquaint the worker with the power of his instrument; but, if a general rule is desired, it may be laid down that, if a double lens, whose focus is about the same as the length of the longest side of the plate employed, be halved, it will be quite safe to use it for the same plate when the halved lens is employed.

So far the subject from what may be termed a mathematical standpoint. We have now to consider what other restrictions or drawbacks there are. First, and most important, is the position of the diaphragm. When using the halved lens, a strong flare spot is almost certain to be produced, owing to the diaphragm being too close to the lens. To prevent this, some arrangement has to be made for separating lens and diaphragm, and the simplest way to do this is to send the lens to the maker, with instructions to supply a portable extra lengthening piece for the body. To use it, after the removal of the first lens the back lens should be unscrewed, the lengthening piece screwed in, and then the back lens screwed into the atter. The lens is then complete, and this addition will add very little to the cost; it will be useless in most circumstances to attempt to employ the lens without this addition.

The next restriction will be in the use of the aperture. No single or so-called landscape lens can be worked with so large an aperture as the double lenses; hence the halved lens will have similar limits, and will not be suitable for figure pictures. Then, as the curves of the individual constituents of a rectilinear lens are devised for their combined and not their separate employment, it will be advisable, when sharpness is required, to use small stops—a point, in these days of quick plates, of absolute insignificance. Finally, it will scarcely be needful to remind the reader that any "stop" used with the halved lens will require just four times the exposure that would be needed when it was employed with the full power of the unaltered lens.

Let me now refer to the two photographs. The building is a view—eleven inches long—of Eaton Hall, which occupies the chief part of the field, and was taken with the half of a ten-inch focus portable symmetrical, with the body lengthened as described. (I employ the same lengthening piece for both the ten and the eight-inch-focus lenses I use.) A close inspection, even permitting the use of a straight-edge, will fail to reveal the slightest curvature in any of the straight lines, and it would be difficult to select a subject that would be more trying to the rectilinear powers of any lens.

The second photograph represents a view of an exhibitor's stall at the Royal Agricultural Show, and was very instructive, as showing the limits of the power of lenses so halved. Desiring to take the view from a close standpoint, I first focussed with the half of an eight-inch-focus "Portable," with the result that a cubical-shaped object in the foreground approaching the edge of the view did exhibit curved straight lines; but, when it was replaced by the halved ten-inch, the result, which speaks for itself, was obtained.

I hope that these remarks of mine may remove some of the cobwebs of error that have for so long been clinging round the subject of single *versus* double lenses for architecture.

G. Watmough Webster, F.C.S.

A PHOTOGRAPHIC PLAGUE.

A large and important branch of photography is not within that happy condition of being threatened, for that usually implies long-maintained healthy vigour, but is actually at this moment in rapid progress of being eaten up by locusts, ugly, ill-favoured, many of them limping and mutilated, others abortions, but taken together irresistible by their numbers, and dangerous by their very worthlessness.

During several months past it has been my duty to interview a number of editors and photographers concerning the publication of reproductions, and it has been strongly impressed upon me that the convention or arrangement arrived at some time last year on the subject of a universal minimum, while, in a few instances, it has done some little good, fails to touch the larger number of cases. In so far as it has established a kind of *primâ facie* right for every professional to claim at least half a guinea, it is well, and, providing that he does not contract himself out of it, he gets something which makes it worth his while to step off the beaten track of his ordinary work. Unfortunately a number of gentlemen, who, no doubt, mean very well (to themselves), have so construed the word "*minimum*" as to make it embrace almost anything brought to their notice.

"We never give more than the usual price (10*s.* 6*d.*)" is the kind of remark one too often hears. It naturally follows that, as a rule, the work from professional sources submitted is only of second-class merit. The higher type of worker would positively lose money by supplying subjects for illustration upon such trumpery terms, even counting in the value of the advertisement, which some editors try to make the artist they are seeking to sweat think is "beyond all price."

But I know better, not from my own experience, but from the accumulated testimony of several notable men. These simply laugh at any great gain accruing to them from a notification in an obscure corner running "*From a photograph*, by A. Flat." Granted that, where photographs are printed in conjunction with an article devoted to the life or work of a particular photographer, or are accompanied by notes, in which a reasonable prominence is given to the producer of the photographs, it may be worth while to take reduced terms, or even lend prints gratis, in all other cases one may, as a rule, consider the business value of this kind of publicity worth little or nothing. Exceptions to this will, of course, occur to my readers. I will, however, not stop to consider these, but proceed to point out what is the outcome of the foregoing state of things.

Managers, by systematic under-payment having become accustomed to receiving little but cheap trash from professional sources, have with thrifty acumen gone a step further, and are now being inundated with rubbishy views, &c., which simply pour in upon them without end, and—"oh, the pity of it!"—are *offered for nothing*.

This is no imaginative fiction, but up-to-date information of the present state of the market. Only a few days ago I spoke to a certain editor of a most prosperous illustrated periodical; he was delighted with a subject I proposed for an article, whereon I suggested that some splendid photographs available should be worked in. He hesitated. "He'll want paying?" "Of course!" He at once declined, saying, "We have more than we can use for nothing." Another man accepted an article illustrated by two photographs; but, as soon as it was hinted that the minimum scale was to be charged for them, he almost gasped for breath with astonishment, and would have none of them. Have them for nothing I determined he should not, although the photographer, being a friend, would, rather than that my article should come back, let me give them to this greedy one, and they and the article are still waiting for one who will pay for them. For their own sakes, no less than for that of their fellow-workers, every photographer should do as I did in the above case, and no writer who is sufficiently talented to feel the kinship existing between all the various workers in the manifold walks of art will for a moment lend himself to any proposal for filching the photographer of his, in most cases, hardly earned successes. I do not like the term "boycott," but see no harm in "isolate," which is what I would counsel all who respect themselves and who love their craft to do to those journals which would rather foist photographic rubbish upon their readers than pay a reasonable price for good work.

Leave them severely alone to sink down as they deserve into the swamp of mediocrity, and as they assuredly will do, unless vanity induce the impatient members of our fraternity to supply them with a gentle current of something for nothing. Happily there are some proprietors who, recognising that first-class photographic productions are not exactly "machine-made," but are meritorious, and, moreover, attractive, willingly pay reasonable sums for work of the right sort. These would, no doubt, in time give even more generously than at present if they had not to face the competitions of rival journals, which are largely illustrated by the "free contributions" of those who thus do their photographic *confrères* a double injury. Remember, every time you give a publication permission to reproduce for nothing, or on unduly low terms, you are discouraging the managers of more liberally conducted periodicals from paying remunerative prices to yourself and others. In fine, the photographic sheep must stand in compact array shoulder to shoulder and face the journalistic wolf, unless they wish to be eaten up piecemeal.

There is, however, one weak spot in the photographic ranks, already in passing alluded to—the amateur. Please do not sneer at the word, you who are labouring to live by your camera, for some amateurs produce work which the professional cannot possibly rival, because the latter lacks time, money, and opportunity. Such amateurs are the men to be feared, the reason being *not* that they are clever, nor that their work is superlative, but *because it is given gratis*, because it is freely bestowed without fee or reward.

That such is the case is mainly the fault of professionals and their friends who write for the technical press. For years past every amateur has had dinned into him, "*You must upon no account receive money*"—a truly preposterous doctrine, which has done more to bring down values than has even the suicidal cutting of prices by rival professionals. The photographic press has on this point been too complaisant, and has sedulously fostered the idea that it is a cardinal sin to sell a photograph unless one keep a shop or studio. And so it has come to pass that the amateur, taking all this bunkum as if it were an obligation of honour, positively feels insulted at what he has been taught to consider the abyssmal degradation of "paid photography."

This supremely artificial notion is the outcome of distorted deduction, applied without rhyme or reason from the customs of the racing track, the football field, and other forms of sport. Whatever else photography may be, it is not a sport.

If we trouble for a moment to look round upon those who are engaged in other paths of activity, we shall at one recognise the falsity of the position into which the photographic amateur has been pushed. Is there in the wide world a greater amateur than John Ruskin? I trow not. Does he, because an amateur, give away the workof his brain? By no means. Again, was not the most illustrious man of science of the Victorian age also an amateur, he who confessedly took up his epoch-making investigations for the pleasure it gave him to do so? I refer to Charles Darwin. Nevertheless, the revenue derived from his works was admittedly very large. Yet no one ever suggested that these two, not being professionals, had no right to charge for their work.

Space fails me or I could ring the changes through most of the leading vocations, with citations of amateurs worthily earning and very properly receiving the wages of skill and labour.

From the foregoing let all who read learn the lesson that we must, as soon as possible, enfranchise the amateur, teach him that it is not only sweet but honest to be paid, place in his breast a greed for gain, and then there will be small fear respecting his competition. The best amateurs—none so numerous as to be dangerous—will get good prices, the small fry will ask prices which they will not get, and the professional will no longer get the cold shoulder.

If I have written rather lengthily upon what is, after all, a very vital matter, it is because upon the clearest evidence I feel that something should be done to sweep away the curse of cheapness. I have heard the loud cry of agony coming not only from below but from above at the deplorable cheapening of high-class photographic pictures by editors, ingnorant, callous, or grasping. In several cases it is not so much that money is greatly coveted for its own sake, but there is a deep and resentful feeling of humiliation that the produce of so much cultivation, care, and ability should be appraised at a value which is offensively insignificant.

While numerous illustrated journals are content to insert bald and trite topographies from under-exposed, halated, distorted, and otherwise faulty negatives (and as I write these lines, May 16, I have before me a whole page of a highly respectable sixpenny periodical, containing eight reproductions which illustrate the above catalogue of faults), and while, on the other hand, they can obtain compensation for this poor stuff by the free use of such prints as, say, Colonel Worsley Benison's, they will offer little encouragement for brilliant and imaginative camerists to leave the dreary track of commercial portraiture or topography. Indeed, I have by me recent letters from photographers who are of the first order of mérit saying that, in view of the small encouragement received from the public and from the press, they are giving up composition and artistic illustration by means of the camera; it does not pay in comparison with the every-day humdrum actualities which are wanted for ordinary consumption.

I have, supra, suggested closer combination of photographers, and the freeing of the amateur from the pernicious law forbidding him to take money; also "isolation" as possible ameliorating agencies. This does not exhaust the alternatives, although it does my paper, and so I must wait another opportunity; the more so, that these other methods, which for the moment I hold back, are such as would demand some personal supervision. When I am able to give this myself, or when I find some other suitable person who is willing and able, I will broach my further proposals anent the elevation of fees for photographic reproductions. HECTOR MACLEAN, F.G.S.

GELATINE *VERSUS* COLLODION.*

As said before, veiled negatives can be used if they are dense enough, and comparatively thin ones will do if they are very clear; but there is no doubt that, from a business point of view, the clear negative is the one to aim at, because it will not only print more quickly, but the time required can be more easily estimated beforehand. It is a distinct advantage to the worker to be able to estimate the amount of exposure, as measured by an actinometer, so as to avoid the opening of the printing frame, which sometimes results in the doubling of the image.

It has been constantly stated that no plates on the market can be successfully used for photo-lithography other than those specially made for the purpose. Now, I am not going to deny the excellence of the so-called photo-mechanical plates, but I never could see that there was any adequate reason for charging fifty (or more) per cent. for them than for other good makes of plates. They do not seem to have so much greater quantity of silver in them than ordinary plates, I should say no greater, because the latter have enough silver to give all the density required. I recommended a large user of photo-mechanical plates, who ordered them by the gross, to try lantern plates, and he now uses them exclusively, with a saving of one third or more on their plate bill, with equally good results. I have used hundreds of the ordinary plates on the market, and have found them good enough for all ordinary work. It would be unjust perhaps to other makers to give the name, as it might seem to intimate that others were not good. I do not wish to convey that idea, because I have not tried all makes. That some plates are not suitable I can aver, from having been once supplied with about fifteen dozen plates

* Concluded from page 313.

supposed to be specially made for copying purposes, that turned out exceedingly bad in consequence of the emulsion being chemically fogged. They were coated by hand, not by any means evenly, and so were much more opaque wherever the coating happened to be thicker. The ordinary gelatine plate has the advantage over the photo-mechanical and lantern plates of a much higher degree of rapidity, which is of considerable importance when the light is bad. My estimate of the speed of ordinary gelatine plates as compared with collodion for copying purposes is that they are about fifteen times as rapid when they are called "thirty times" rapid, and this with a bath and collodion not in their most sensitive condition. To get the greatest benefit from this rapidity, however, the plates should not be developed immediately after they are exposed. The exposures should be accurately timed, and the development deferred so as not to be hurried, by which means the light may be made the best of. The developers may be either pyro, well restrained, or hydroquinone. I formerly used ferrous oxalate, but now quinol. Some of the new developers recommended for copying work I have not tried, but are probably as good. Some lantern plates do not seem to keep as well as ordinary plates, while others keep very well, and I would recommend those who have occasionally to work for photo-mechanical purposes to try their best to master the use of ordinary plates, on account of their being always at hand or easily procurable. One of the chief points is to keep down the exposure to suit the rapidity of the plates, so as to be able to give plenty of development without fogging the lines. There will be found a latitude in exposure even here, if the development be not too rapid, for it takes time for the developing fluid to penetrate the film. With a restrained developer and a proper exposure, the result will depend almost entirely on the character of the drawing or engraving copied from; a brilliant negative must not be expected from a dull copy.

It is a very common idea that there is something in the nature of the collodion process that favours density of deposit in a greater degree than is found in gelatino-bromide plates; but, upon examination, it will be found the newly developed gelatine plate gives more density than the collodion plate in its recently developed state. The difficulty comes in in the after-processes. The collodion plate can easily be strengthened by redevelopment without staining on account of its being more easily and quickly washed, and by reason of the film resisting the action of the chemicals upon it. It is also amenable to modes of intensification that will not suit films of gelatine. Though I have never made a special trial of the matter, my observations lead me to the conclusion that, if exposures of gelatine and collodion films be made to the same copy and developed, and both be intensified with mercury and ammonia, the gelatine plate will give the denser image. If the ferridcyanide of lead, followed by ammonia sulphide, be used upon the collodion plate, much greater density will be obtained than by mercury and ammonia, and that will be still further increased on drying, which is one of the reasons why many photo-mechanical collodion workers do not varnish their negatives, varnishing having a tendency to weaken them.

I believe it is a commonly accepted axiom among the photographers who employ printing on zinc that dry-plate negatives are altogether unsuitable for the purpose. They can, however, be readily used. There is a firm, which produces a large number of blocks weekly, who consulted me on this very subject. Their studio is so situated that they cannot use wet collodion, in consequence of certain unavoidable fumes putting the bath out of order, though their operator is an experienced collodion worker, and worked it successfully when the studio was differently situated. They therefore took to photo-mechanical plates, and produced photo-transfers on paper. These were not altogether satisfactory, and it was thought desirable to print direct on the zinc; but "everybody" said it would not answer with dry plates. I soon convinced them that any negative that was good for printing on paper would give an equally good print on albumenised zinc, and now they adopt that method exclusively, with a considerable saving of time.

However much I may have herein said in favour of gelatine plates, it must not be thought that I think them equal to wet-collodion for the purpose under consideration; they are not, but they run it so close, that I do not consider it necessary for any one to make a wet-collodion installation who only requires to produce this kind of negative occasionally. For those who make block-producing a special business, collodion is the thing, because it is less costly, and, in spite of the greater sensitiveness of gelatino-bromide, more work can be done by it under the ordinary conditions of working, because all other operations than the exposure are more rapidly performed. In collodion, the development is almost instantaneous, the washings become little more than rinsings between the various stages, the intensifying takes no more time than gelatine does, and the drying of the finished negative can be done quickly by artificial heat.

The advantages of gelatine need not be insisted on at the present day, as they are acknowledged on all hands, and may be summed up as follows:—1. Plates always ready. 2. Easy manipulations. 3. Less staining of the hands. 4. Increased sensitiveness. 5. Bearing rougher handling. 6. Affording a more evenly distributed film.

To those amateurs and professionals who wish to try the making of photo-mechanical negatives, I say, Do not listen to those who say that gelatine plates cannot be used, for it is a fact that all good copies can be efficiently reproduced, and even very bad ones, with perseverance. I have produced photo-lithographic transfers from some of the worst of copies, and, indeed, such as would be difficult to copy with wet collodion, and that with *ordinary* gelatine plates. I have especially in my mind an old tracing that had become more like brown paper by age than white, and in which much of the drawing was not black, though apparently done in china ink. It was certainly a good deal of trouble to remove the ink from the transfer, but it is quite possible that even more difficulty would have been experienced with wet collodion, on account of the dirty yellow orange hue of the paper.

I have recently taken a good many half-tone negatives by the screen process on ordinary dry plates, and in some respects they seem better than when taken by collodion. It is true that the transparent dots in the lights are not quite as clear as on collodion, but they are clear enough to print successfully on zinc, and, practically, that is all that is necessary. On bitumen they print even more successfully, as I know by some work I did a few years ago which was very successful, though the screen was not as good then as now, and was made on a different principle, for the lines composing it were very weak.

Before concluding, I would say something about intensification. There seems to be nothing better for gelatine plates than the use of mercuric chloride, followed by dilute ammonia. The great point is to thoroughly fix. If the fixing bath works moderately quick, leave the plate in for five or ten minutes after the bromide has disappeared, then rinse once or twice to carry off the chief part of the hypo. It may be used until it becomes darkly discoloured without staining the plate, though hypo is cheap enough to be more liberally used. Now put to wash, *face downward*, for fifteen minutes. More time may be given, but a quarter of an hour is sufficient to ensure freedom from stains. If no more convenient utensil be at hand, a dish may be employed by putting a glass stopper from the nearest bottle at one end of the dish, and let the end of the plate rest upon it, of course face downwards, as before mentioned. One change of water, with the opposite end of the plate on the stopper, or other convenient rest, will effectually wash it for intensifying purposes, and then it may be put, face upwards, into the solution of mercuric chloride until white. Wash again in a similar manner and for an equal time, then put into the weak ammonia solution, afterwards washing finally as long as is thought judicious, though little is really required.

And now I am going to make what I know to be a very unorthodox statement. *The same porcelain dish may be used for developing, washing, fixing, whitening, and blackening*, and no stains will occur from such ill usage. Of course, there is the washing between the various uses the dish is put to that helps to keep it right, and, though the dish may become discoloured, especially in the next developing operation, yet the negative will not be stained on account of such use of it. I wish to insist upon this, because I have seen it so often stated that such use of a tray is a cause of stains, that I wish to correct the idea. It must not be supposed that such a course is recommended as any advantage, beyond a saving in the room occupied by many dishes, but it is dwelt upon because there is nothing that bars progress so much as attributing failures to wrong causes. If a person finds a stain upon his negative, and attributes it to the employment of his dish for more than one use, and that happens not to be the cause, he is effectually prevented from finding out where his error lies. I am not ignorant that there are photographic processes in which soiled dishes are a source of trouble, and, indeed, where it is very difficult to keep them clean enough even when they are religiously kept to one use, but that refers to a somewhat remote period of photographic history, when the developer was used in conjunction with free nitrate of silver—a very different condition to that obtaining in alkaline development, where the image is reduced from the bromide of silver forming the sensitive film.

In comparing the processes of gelatino-bromide and wet collodion, it is found to be a fact scarcely disputable that collodion yields the greater amount of brilliancy and contrast when applied to copying plans and suchlike work from the flat. This seems to be partly

due to its less degree of sensitiveness, the small amount of energy given off by weak light from the dark lines not being sufficient to effect the reduction of silver by means of the developer. In the gelatino-bromide the film is so much more sensitive, that with ordinary plates there will be a sensible veiling of the lines if the development be continued until sufficient density in the whites be obtained. By stopping the development at the proper point, sufficient clearness may be obtained, and subsequent intensification will make the whites dense enough to get a good transfer from the negative.

When the work to be copied contains very fine lines, such as occur in many copper-plate engravings, the superiority of a collodion negative is more plainly seen, such lines being therein pretty clear, whereas in the gelatino-bromide negative they lack transparency. This seems to be generally attributed to the greater coarseness of the silver bromide granules offering a resistance, as it were, to fine definition. This seems to me to be an insufficient explanation, for the particles are not so coarse but they can overlie each other, and form a practically continuous film on which the lines may be projected. The mischief may be somewhat palliated by backing the plate, though reflection from the back does not count for much in exposures for copying purposes, and, when it does occur, does not restrict itself to the veiling of fine lines only. I think the defect under consideration is more probably due to the opacity and thickness of the film favouring lateral extension of the light, so that the edges of each illuminated streak become radiants to the line lying between it and the next. It is probable that this lateral illumination occurs at all edges, though it only shows as a veil when the lines encroached upon are exceedingly narrow. The light, in passing through the collodion film, behaves in precisely the same manner, though, in consequence of the usually greater transparency of the film, its lesser sensitiveness, and more red colour, the veiling is reduced to a minimum.

W. D. Richmond.

THE DARK ROOM AND APPLIANCES.

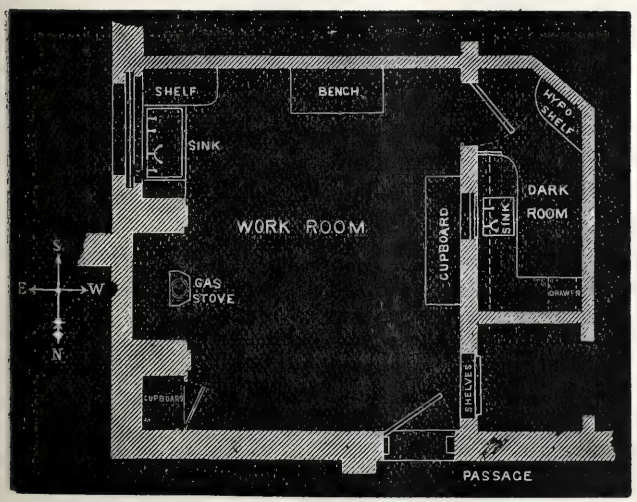
[Woodford Photographic Society.]

The subject is a large one, especially as regards appliances, which are being duly improved and added to, and, many of those present having had much longer experience in photography than myself, I feel some diffidence in bringing the paper before you; but, having lately had the opportunity of arranging a work room and developing a dark room for my own use, perhaps the arrangements that have been adopted may be of some interest.

When planning alterations and additions recently made to my house, the old kitchen and an adjoining pantry were transformed into a work room and dark room, where, without troubling any one or interfering with any household arrangements, I can do what I like, and only when cleaning is necessary does any servant enter. No one is allowed to tidy up, as they too often think they are doing, much to the vexation of the person who has to find things they have tidied.

The arrangement of these rooms is shown on the plan.

The work room is, roughly, twelve feet six inches by twelve feet.



Entering from the passage by the door at the west end of the north wall, immediately on the right is a recess, in the west wall, formed by the old entrance door (which has been boarded up), deep enough for shelves for bottles. Beyond this is fitted a cupboard, about twelve inches deep inside by four feet six inches long, fitted with shelves and doors. Here cameras, printing frames, scales and weights, and various larger pieces of apparatus can be stored.

The top of this cupboard is almost level with the sill of the window of the dark room. Beyond the cupboard is the door of the dark room, hinged to open into that room.

Against the south wall a cabinet, forming also a carpenter's bench, is placed, and shelving can be fitted as required. All the fittings have not yet been completed. At the south end of the east wall is the window, facing the door of dark room, and in front of the window is fitted a large sink of earthenware, thirty-two inches long, fifteen inches wide, and eight inches deep inside, having waste pipe and overflow.

At the right-hand end of the sink is a broad shelf, sixteen inches, and a narrow one, eight inches, is at the other end, these, with the sink, filling the recess for the window. A plentiful supply of water, both hot and cold, is laid on, there being in all four taps or valves for water over the sink.

Two of these are ordinary half-inch bent-nosed screw-down valves, and are placed one near each end of the sink. These taps are available for all sorts of purposes, and especially for use with washers, for which purpose Royle's unions, with rubber tube, are utilised. The union is simply slipped over the nose of the tap, and the end of the rubber tube attached to the inlet of the washer; but another of these unions might be used to connect to the washer if desired. These unions are a great improvement on the old-fashioned screwed ones. Formerly either the screw thread would not enter properly, or the leather washer was missing, or a spanner had to be got to screw up the union tight. Now there is no trouble, and the connexion is made practically instantaneously, and there are no loose parts to get mislaid or that have to be looked for.

A third tap, to the left of the centre of the sink, is fitted with a swinging arm, with a rose for rinsing plates, &c. As is usual in this form of the tap, the arm, when back against the wall, cuts off the supply of water. The passage for the water begins to open when the arm is pulled forward to about forty degrees, and after that the full opening is soon reached, so that with the arm full out over the middle of the sink, which is the most convenient place to manipulate dishes, &c., the full pressure of water rushes through the rose, which is often much greater than is desirable. If the arm is pushed back to reduce the flow, one is apt to come against the sink with the plate or dish, which is not to be desired. When looking for such taps, four years ago, I determined to have control over the supply of water independent of the position of the swinging arm, but found great difficulty in finding what I wanted. After applying to various photographic dealers, and even to several makers of water fittings, I at last found, at Hinton's, in Bedford-street, Strand, swing taps with an ordinary tap on the swinging arm, so that, even when the arm is full out over the centre of the sink, the water can be completely shut off. This I consider of great advantage.

The fourth tap over the sink is connected to the hot-water service of the house, and is very handy for washing dishes, bottles, &c. This tap is one of Lord Kelvin's valves.

In the recess under the chimney, where the old cooking range stood, a gas stove is fitted, which serves for warming the room and for drying plates, &c. On top of this stove is an atmospheric burner, on which a kettle can be placed to warm water, or a still might be placed to make distilled water if desired. The sides and back of the recess are lined with teapot-brown tiles.

The remaining part of this east wall is occupied by a deep cupboard fitted with shelves and doors. The north wall, in which is the entrance-door, is available for shelves if required, or might be used as a screen for trying lantern slides on. The floor of the room is left as it was originally, in black and red tiles; a square of old carpet laid down in the middle of the room makes it more comfortable to the feet. Gas jets can be arranged where required; the positions of these have not been permanently decided on yet. On the south wall, on right of sink, batteries are fixed at a convenient height, to which films or prints can be pinned to dry.

It is proposed to fix thin sheets of cork here, so that the pins may be more easily put in. Below this is a drying rack for negatives, formed of a batten fixed to the wall. In this a row of French nails are driven at such distances apart, and standing out far enough, for the corner of a negative to rest between two nails, whilst its opposite corner rests against a batten higher up (film side next wall, so that no dust will fall on it). This does well for glass negatives, but films must be pinned or hung with clips face outwards; and roller films I find best pinned at all four corners, to prevent them curling up.

The window is large, and only a cotton blind is fitted at present; but, should the room be required for enlarging, &c., by artificial light, frames of light wood covered with light-proof material can be fitted, a part being covered with non-actinic medium. All ordinary operations can be done

in this room in comfort. A Mica flap ventilator in the chimney near the roof draws off the heated air, and the lower sash of the window being raised a few inches, and a board fitted to cover the opening at the bottom, forms a tobin pipe, the air entering the room between top and bottom sashes.

Now let us come to the dark room, which might be more properly called the developing room. The room should not be dark, as that term is usually understood. There should always be sufficient light to see what one is doing, but the light must be non-actinic. The dimensions of my dark room are, roughly, six feet two inches by four feet, the west wall of the work room forming one of its longer sides. The corner facing the door is cut off, owing to the structural arrangements of the house. Facing the door, which opens into the room, a shelf is fixed on the angled wall, and is entirely devoted to the hypo and alum baths, whilst the stocks of these solutions are kept in large bottles underneath, and thus are quite apart from other chemicals.

An earthenware sink, twenty inches by thirteen inches by eighteen inches, is fitted against the wall to right of the door, and, level with the top of this, a shelf extends on each side and across the other end of the room. At this door end of this shelf a vertical board is fitted against the wall from floor to ceiling, deepening the recess for the door and acting as a shield to prevent any possible leakage of light from the door reaching plates, &c., when being developed, &c., over the sink.

The shelf is about fifteen inches wide. The sink is fitted with two water taps, one a swing-arm spray and the other a half-inch nose tap, both exactly like those already described. A grid, formed of wooden laths, is fitted over about half the sink, on which the dishes are placed when developing, so that any spilt liquid falls into the sink. The grid can be slid to one side or the other, so that either the spray or the other tap can be freely used. The window is right over the sink, and will be described presently. A narrow shelf about four inches wide runs the whole length of the wall just under the window, and about twelve inches or fourteen inches above the top of the sink. Other narrow shelves are fitted on each side of the window. Narrow shelves are preferable to wide ones for bottles, and should be only a little wider than the diameter of the bottles. Not more than one row of bottles, &c., should be put on one shelf. Under the shelf, across the end of the room, is a light-tight drawer, useful for putting paper or plates in when changing or printing by saving the time and trouble of repacking them in boxes, &c., whilst temporarily having to turn up the light.

Over the hypo shelf a gas jet, with matchless burner, is fitted, and is a most convenient fitting for bromide or lantern-plate printing. A folding shelf is to be arranged on the wall opposite the door, at such a height as to support frames when printing by gaslight, graduations or stops being marked on it so that the frames may be easily and certainly placed at the proper distance from the light. The window over the sink has two sashes of one pane each, ground glass, eighteen inches wide by twelve inches high. On the outside—that is, in the work room—a light wooden frame, having a thickness of yellow medium on each side, covers the entire window frame.

A gas standard is arranged on the top of the cupboard in work room in front of this window, and, by arranging the gas pipe so as to have a tap inside the dark room as well as outside in the work room, the light can be controlled from either room, whilst, the light being outside, the dark room is kept cooler.

The amount of light passing through this window I did not find to fog plates—ordinary ones, I do not refer to isochromatic, which I have never yet used—but the general illumination of the room I found caused difficulty in judging density in looking through plates. I have, therefore, covered the upper half of the window with brown paper, and placed strips on the sides of the lower pane, so that, in examining a plate, practically all the light reaches the eye through the plate, thereby enabling density to be more easily judged. E. B. Caird.

(To be continued.)

ADAMSON'S INCANDESCENT LIGHTING SYSTEM FOR PORTRAITURE.

At the showrooms of Messrs. O. Sichel & Co., 47, Oxford-street, W., there is on view the incandescent electric lighting system which Messrs. Adamson Brothers, of Glasgow, have devised for studio purposes. This consists of a large concave radiator of the usual pattern, so swung as to be easily adjustable in every necessary direction for studio portraiture. The source of the electric illumination, instead of being an arc lamp such as is resorted to in most systems of a similar kind, is derived from a number of incandescent lamps. Two of these are placed in the centre of the radiator, and give sufficient light for focussing by. Around the circumference of the radiator are placed other incandescent lamps. Space is provided for forty-eight of these, but twenty-four only were available on the system we inspected. Current being available from the main, the light is turned on in the usual way, and is quantitatively under control. The maximum power obtainable with twenty-four lamps is between four and five thousand c.p., which with a rapid plate and Ross's cabinet lens allows of as short an exposure as one second. It is calculated that the cost of each exposure is only one halfpenny. The system is quite noiseless, and is evidently a uniform and agreeable one to work. Some portraits that were taken with it, and which were shown us, attest its practical value, the light given being of a peculiarly soft and effective character.

At this present time, when so many photographers, especially in winter, find it essential to work by electric light, the excellent system of Messrs. Adamson should receive great attention.

Our Editorial Table.

Ilford Isochromatic Plates: Why and How to Use Them.

The Britannia Works Company, Ilford.

This neat *brochure* is in the nature of an introductory guide to the use of orthochromatic plates, and it is couched throughout in such clear and simple explanatory terms that few photographers can fail to grasp the philosophy of the subject treated of. By the aid of diagrams and illustrations showing results on ordinary and isochromatic plates, the advantages of colour-sensitive plates in obtaining proper chromatic gradation are set forth, while the uses of the yellow screen are demonstrated in a similar manner. Emphasis is given to the following statement of Mr. C. H. Bothamley, that "the advantage of orthochromatic photography is most evident in copying paintings, photographing flowers and similar subjects, and in photographing objects under the microscope. For these purposes orthochromatic plates are now regarded as indispensable." And the same gentleman also says that "in portraiture the advantage of orthochromatic plates lies in the better rendering, not only of the colours of dresses, &c., but also of the flesh tints and hair. Freckles and other irregularities of the complexion become less prominent, and considerably less retouching is necessary." It will therefore be seen that the use of isochromatic plates is a matter of special interest to professional photographers and others, who will find much to interest them in the *brochure*.

From Messrs. J. Lancaster & Sons, of Birmingham, we have received the 1894 edition of their catalogue of photographic apparatus, &c. This is, as usual, a handsomely got-up and freely illustrated volume, the value of which to the intending purchaser may be gauged from the circumstance that it sets forth particulars of cameras, lenses, sets of apparatus, in short, all the tools for picture-making by photography, in all degrees of cost and quality and in the greatest possible variety.

Les Phototirages aux Encres d'Imprimerie.

By A. Fisch. Paris: H. Desforges, Quai des Grands Augustins.

The author treats of the various iron and bichromate printing processes as likely to be useful to engineers, architects, &c.

Talbot's Photographisches Jahrbuch, 1894.

Issued by the house of Romain Talbot, Berlin, this is a very complete and well-illustrated price-list of photographic apparatus, chemicals, papers, sundries, &c., in present demand.

Ce qu'il Faut Savoir pour Réussir en Photographie.

By A. Courrèges. Paris: Gauthier-Villars & Fils.

This is a handbook for the beginner, written in simple and direct terms, so as to be easily comprehended by those having no previous acquaintance with photography.

The Strand Magazine and the Picture Magazine.

London: George Newnes, Ltd.

If there were in the *Picture Magazine*, which is issued as a companion to the *Strand Magazine*, nothing but the five full-page

pictures by Mr. Lyd. Sawyer, these alone would render it worth, to photographers at least, many times more than the phenomenally low price of sixpence, charged for a book of over sixty pages, all of them containing "pictures," some of them six on a page. Mr. Sawyer's pictures are photo-typographic reproductions of the following of his well-known works which are familiar to visitors at the principal photographic exhibitions, *viz.*, *Home Sweet Home*, *Reflections*, *A Bashful Caller*, *The Boat-builder*, and *In the Twilight*. There are twenty-eight portraits of Royal Academicians, including Sir Frederick Leighton, G. F. Watts, W. P. Frith, Philip Calderon, Alma Tadema, Hubert Herkomer, Sir John Millais, and others, from photographs by well-known men. Besides these, there are portraits of men and women who have achieved eminence in literature, science, and in politics; comic pictures, old prints, pictures of places, pictures for children, and miscellaneous pictures. They are all well printed on heavy fine paper. The magazine, as a whole, is a triumphant testimony to the value of photography.

The *Strand Magazine*, too, is replete with illustrations, many of which are of a high class in prose engraving and general treatment. Many of the pictures in *A Bohemian Artists' Club* and in *Portraits of Celebrities*, who are depicted at various ages from youth to the present time, will, in lighting and posing, form invaluable studies to the photographer. In Lord Rosebery's portraits, for example, we have the ideas of three firms of photographers. Mr. Justice Wills is represented by five portraits by as many different photographers. Of Sir Charles and Lady Dilke and the Rev. Canon H. Scott-Holland, the same may be said. The literary portion of the magazine maintains the high character it has secured.

We have received from Mr. William Slater, 169, Southampton-street, Camberwell, S.E., a glass-bottomed wooden tray for developing, fixing, or toning purposes, 20 × 4¾ inches. It is well made, the bottom being corrugated.



Lumière's Citos Paper.

Messrs. Fuerst Bros., of Philpot-lane, have sent us for trial a sample of Lumière's Citos' citrate of silver printing-out paper. This we find to yield prints of excellent quality, taking good rich tones in the ordinary separate toning and fixing baths. It prints rapidly.

Lumière's Orthochromatic and Extra-rapid Dry Plates.

From the same firm we have also received samples of Lumière's orthochromatic and extra-rapid dry plates. Upon testing the first-named, by means of a coloured picture in which green and yellow were present, they yielded us admirable negatives, showing a correct translation of the colour values. In other respects, the plates are of excellent quality.

The extra-rapid plates of Messrs. Lumière have the acme of rapidity, with exceedingly good technical qualities.

News and Notes.

The Radial Camera.—Messrs. Marion & Co., Soho-square, send us a new edition of their booklet on the Radial camera. This popular camera is now made in five sizes, *i.e.*, 3¼ × 3¼, 4¼ × 3¼, 5 × 4, 6½ × 4¾, and 12 × 9 centimetres.

Messrs. G. Houghton & Son, of 89, High Holborn, inform us that they have purchased the stock and good-will of Messrs. Amphlett, Humphreys, & Co., of Warwick-lane, E.C., and the business has been transferred to their premises at 89, High Holborn.

The members of the photographic class held in connexion with the Liverpool School of Science, Technology, and Art, assembled at the School on Thursday evening, May 17, for the purpose of making a presentation to their teacher, Mr. E. Banks, in recognition of his valuable services and assiduous care, which have contributed to make the class a success. Mr. C. B. Stonehouse presided, and requested Mr. Banks's acceptance of six volumes of Shakespeare and other works, expressing the good wishes of all for his future welfare and success. Mr. Banks, in thanking his subscribers, reviewed the work of the past session, and dwelt upon the advantage of technical instruction, upon which depended in a great measure the development of photography, perhaps to a greater extent at the hands of the amateur student than the professional operator.

The Council of the Royal Society have selected Mr. J. W. Swan as a candidate for fellowship. *Nature* thus enumerates Mr. Swan's qualifications:—"Joseph Wilson Swan, M.A. (*honoris causa*), Durham, F.C.S., F.I.C., has devoted himself for many years with great success to experimental scientific work, chiefly in relation to electric lighting, the electro-deposition of metals, and the improvement of photographic processes. His labours have resulted in material extension of knowledge, and in important inventions, among which are the incandescent electric lamp, the carbon process, by which the first permanent photographic prints were produced, and which has formed the basis of many processes of photo-mechanical engraving (in this relation the property of salts of sesquioxide of chromium to combine with gelatine and render it insoluble was discovered), the highly sensitive gelatino-bromide photographic plate, the result of an original observation of the effect of heat on the gelatino-bromide of silver emulsion, the cellular form of electrical secondary battery plate, the production of lamp filaments from solutions, integrating electric meters, safety lamp for miners, and an electric firedamp indicator."

Signalling in Trafalgar-square.—On Saturday evening, between the hours of nine and eleven, a small company assembled at Messrs. Lombardi's photographic establishment in Pall Mall East, from the roof of which was given a display of sign-throwing by means of Captain Ronald A. Scott's patent electrical signalling projector. Captain Scott informed those present that the machine was a specially constructed electric search-light projector and the different signals, thrown 200 yards and more by means of the powerful rays on the surrounding buildings, were caused by pieces of prepared mild steel plates being placed between the mirror and the light. In consequence of the enormous heat to which the discs were subjected, they were kept cool by means of a tube of cold water fixed so as to completely cover their edges. Interest was attached to the occasion by Captain Scott cutting the titles of newspapers on several discs, and, on the plates being put in the projector, it was possible to read the names on Charing-cross and Morley's Hotels, and also on St. Martin's Church. Unfortunately the cloud conditions were not advantageous, so Captain Scott was unable to send up the titles of the papers for them to be seen in the air as he proposed doing. It was demonstrated, however, that the invention was approaching perfection.

The Packing of Exposed Plates.—"We give in our untested formulæ this month," says *Dry Plates*, "a method which is said to be helpful in the case of plates carelessly packed after exposure. So much has been said upon this subject in our own pages and elsewhere that it seems needless to say any more. We should be glad if it were so; but, unfortunately, the reverse is the case. Despite all our talking, hundreds of good negatives are still spoilt by the practice of packing the plates, after exposure and before development, with something between them, with the idea of preventing the rubbing of the films. Only a few days ago we developed a dozen plates for a well-known photographer which his careful packing had ruined. No matter how pure may be the paper used, unless it exactly covers the film (and who can ensure this?), there will be a difference in speed between the covered and the uncovered portions, and this difference will show itself on development in a strip of varying densities; if the paper be paraffined, the effect will be, if possible, worse; should printed paper be used—well, we saw the other day some negatives with very positive directions across them as to the best way to make the Cadett pyro-ammonia developer. The photographer forcibly explained this was not what he wanted. Certainly not, nor does any one else; we want developer, not directions, on our plates. Therefore, let every one remember that exposed plates should be packed film to film, and then wrapped round with paraffin paper, and, if necessary, brown paper, the whole parcel being tightly tied, so that no rubbing of the films is possible."

The Royal Cornwall Polytechnic Society's Sixty-second Annual Exhibition will open at the Polytechnic Hall, Falmouth, on Tuesday, August 28, 1894. The Committee have arranged that this year the special feature of their Exhibition shall be photography and the printing press. The Committee point out that this will be the first Exhibition ever arranged of photo-mechanical printing and appliances, and that, in view of the enormous importance of photo-illustrative work, it is sure to attract more than local attention. It is intended that the Exhibition shall cover every department of photo-mechanical work and apparatus, including:—1. Photo-mechanical Prints: Half-tone, collotype, photogravure, Woodburytype, photo-lithographic, &c. 2. Photo-mechanical Printing, showing the actual printing of such works. 3. Photo-chromatic Processes, for the reproduction in colour of pictures and natural objects, will be a special section. 4. Originals for Photo-reproduction: Line and wash drawings, scraper-board work, hand work on photograms intended for half-tone reproduction, &c. 5. Photo-mechanical Apparatus and Materials: Cameras, half-tone screens, chemicals, prepared metals, papers, boards, printing presses, ink rollers, inks, &c. Educational Exhibit: A special Educational Exhibit, showing reproductions from the same originals by various processes, the stages in production of printing blocks, plates, &c., and similar matters, will be prepared under the superintendence of the Secretaries of this Section. Historical Section: A special section will be devoted to historical prints, examples of early processes, and early apparatus, &c., and those who possess such subjects of interest are specially requested to offer them for exhibition. The Society offers awards of silver and bronze medals in various sections for special processes involving important points of novelty, and for special excellence in production. The Exhibition will be held in a spacious hall and adjoining rooms, and will continue open for five days. No charge will be made for either wall or table space. Applications for entry forms and any further information respecting these special exhibits should be made to the Hon. Secretary of the Department, Mr. H. Snowden Ward, 6, Faringdon-avenue, London, E.C.; or to the Secretary of the Society, Edward Kitto, F.R.Met.S., the Observatory, Falmouth.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8492.—"Improvements in or connected with Lenses and their Manufacture." H. L. H. SCHRÖDER and J. STUART.—*Dated April*, 1894.

No. 9025.—"Improvements in the Construction of Hand Cameras." J. THEOBALD.—*Dated May*, 1894.

No. 9053.—"Improvements in the Fastenings for Photographic Dark Slides." H. J. SPRATT, A. S. SPRATT, and G. A. SPRATT.—*Dated May*, 1894.

No. 9103.—"Improvements in Sighting Devices or Picture Finders for Cameras or other Instruments." J. P. WEBER.—*Dated May*, 1894.

No. 9119.—"Improvements in Photographic View Finders." H. HILL and A. L. ADAMS.—*Dated May*, 1894.

No. 9139.—"Improvements in Photographic Cameras for Instantaneous or Time Exposures." A. G. CAMPBELL.—*Dated May*, 1894.

No. 9270.—"Improvements in the Manufacture of Photographic Plates." O. MAGERSTEDT.—*Dated May*, 1894.

No. 9361.—"Improvements in or connected with Detective and suchlike Cameras." J. J. HICKS.—*Dated May*, 1894.

No. 9432.—"Improvements in Instantaneous Shutters." T. V. JENSEN, C. HANSEN, and S. J. JENSEN.—*Dated May*, 1894.

No. 9479.—"An Improved Method of Tinting or Colouring Photographic Prints." R. BIRD.—*Dated May*, 1894.

No. 9603.—"A New or Improved Photograph-washing Apparatus." P. ANTOINE.—*Dated May*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN HALF-TONE NEGATIVES FOR PHOTO-MECHANICAL PROCESSES.

No. 20,342. FREDERIC JOHN MATHEW GERLAND, Bayonne, in the County of Hudson and State of New Jersey, and also of 26–30, Vesey-street, New York City, New York, U.S.A.—*April* 21, 1894.

THIS invention relates to photo-engraving and printing processes, and its object is to provide a new and improved negative, which has the film on the sensitive plate so treated by the action of the admitted light as to improve the final result over existing methods, and to produce a half-tone negative having the film in the high lights treated by a photographic chemical process to form non-printing spaces, which would otherwise have to be cut out of the film by hand, or touched or printed out on the ordinary negative.

The invention consists of a half-tone negative, having the film in the high lights photographically and chemically obliterated to form non-printing spaces in the negative.

In preparing negatives for photographic processes as heretofore practised, the screen was employed in front of the sensitive plate during the time of the exposure, so that the negative image of the subject under treatment was formed in dots or lines on the sensitive plate. By this former process no pure white spaces could be produced in the final prints without injury to the general appearance of the picture, and, consequently, the prints thus obtained from the finally finished negative had a flat appearance.

In order to photographically produce a negative having full tones, half-tones, and clear spaces in the high lights, various processes may be employed. I prefer, however, the following process:—I divide the full exposure into periods of time, during one of which the sensitive plate is subjected to a partial exposure without a screen, and in the other the screen is introduced between the lens and plate. In the first period a sufficient exposure is had, so that the high lights from the lighter parts of the object to be reproduced in passing through the lens on to the sensitive film deaden the latter in places corresponding to the lighter parts of the object, and hence render these places non-sensitive for further deposit of light. In the second period, dots or lines for the relief plate are produced on the dark parts and half-tones of the subject under treatment, and the semi-tones of the first exposing period are not further disturbed, but remain true according to the subject. As the sensitiveness of the film has been destroyed by the light in the high lights, the said part of the plate is not affected by the screen, and consequently no dots whatever are formed in those places, and consequently the negative contains pure white spaces, half-tones, and all gradations of the copy or subject. After the full exposure is made, the exposed sensitive plate is then developed, fixed, and dried in the usual manner to prepare the plate for printing. It is not essential that the screen be used in the second period, and an unobstructed exposure be had in the first period, as this order may be reversed, and the screen used in the first period, and an unobstructed exposure made in the second period. By the method described, a negative is produced which has a uniform tone in the high lights, which tone produces a clear or non-printing space in the positive print on the stone, zinc, or copper plate, so that the finished print shows clear white spaces in the high lights, corresponding to the light places on the object photographed. It is well known that this work of removing whites from the stone or plate had formerly to be done by the artist with the aid of suitable tools or acids, or the artist touched up the negative.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I declare that what I claim is:—1. As a new article of manufacture, a half-tone negative, having the film in the high lights of the plate photographically and chemically treated for forming non-printing spaces in the positive, substantially as shown and described. 2. The herein described process of producing half-tone negatives for photographic processes, consisting in subjecting a sensitive plate to a part of the time for a full exposure without a screen, and for the remainder of the time of the full exposure with a screen between the negative and object, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
28	Camera Club	
28	North Middlesex	*Perspective and the Swing Back.* J. McIntosh.
29	Birmingham Photo. Society	
29	Hackney	*Isochromatic Photography.* W. H. Barnes.
29	Halifax Camera Club	
29	Lancaster	
29	Leith	
29	Paisley	
29	Warrington	
29	West London	
30	Burnley	
30	Croydon Camera Club	Debate on *Quick-work Photography.*
30	Hackney	Excursion to Loughton. Leader, A. Dean.
30	Leytonstone	
30	Photographic Club	Hand Cameras.
30	Southport	
31	Camera Club	
31	Glossop Dale	
31	Halifax Photo. Club	
31	Hull	
31	Liverpool Amateur	
31	London and Provincial	
31	Oldham	
31	Sheffield Photo. Society	Excursion to Knaresborough.
June.		
1	Brighton and Sussex	
1	Cardiff	
1	Central Photographic Club	
1	Croydon Microscopical	
1	Holborn	
1	Leamington	
1	Maidstone	
1	North Kent	
2	Hackney	Excursion to Enfield. Leader, F. E. Roof.
2	Hull	
2	Oldham	Excursion: Alderley. Leader, J. Jackson.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

MAY 22,—Technical Meeting, Mr. E. Cecil Hertslet in the chair.

Mr. J. R. Gotz showed two of the new Zeiss lenses, constructed on the same principle as the old five-lens form, but of different material. It was claimed that the lenses would do everything that the Goerz Double Anastigmat would do. An eight-inch Zeiss covered a whole-plate with full aperture. Examination through an ordinary magnifier revealed no astigmatism. Mr. Gotz also showed a new photometer, the action of which is based upon the decomposition of hydrochloric acid by an electric current. The mixed gases drive a fluid up a glass tube, and, the current being taken off, the access of the light to the gases in the bulb recomposes them, and the descent of the fluid enables the light action to be measured and read off.

HALF-TONE ETCHING ON COPPER.

M. HENRY CALMELS gave a discourse and demonstration on half-tone etching on copper, the fish-glue process being the one described. It consists of coating the copper plate with bichromated fish glue, and exposure under the negative, dissolving off the unaltered parts of the resist in water, and then heating the plate until the fish glue was burnt into the copper, heat being applied to the plate until the resist was of a dark brown colour. The etching solution consists of perchloride of iron.

Mr. Calmels developed and heated a plate, and subsequently pulled a proof.

Mr. H. A. LAWRANCE said that he worked the process with a carbon resist, and sometimes had got a positive and sometimes a negative on the plate.

Mr. CALMELS said this was due to overheating.

Mr. SNOWDEN WARD showed two samples of fish glue, one of which was specially clarified for the purpose by means of the coagulation of albumen.

Mr. CALMELS, in reply to a question, said that the fish glue must be absolutely neutral, whereas, in the preparation of isinglass, acetic acid was used.

Mr. THOMAS BOLAS did not see the advantage of the fish glue, or how the process differed from the albumen method.

Mr. SNOWDEN WARD said the fish glue gave a tough, hard film.

Mr. DAWSON said that this was a great disadvantage. Speaking as an individual, he said he did not think the fish-glue process was worthy the reputation that is given to it. For one copper block a hundred zinc blocks were made, the main reason being cheapness. A weak part of the process was that the blocks could not be cleaned with potash or lime. The Swantype Company's blocks were very good, but they were not printed the same as other work. If the surface of the block was injured, it had to be thoroughly cleaned, and the "enameline" would then be rubbed off. This might remove part of the surface. He thought enameline would have to be abandoned, and that they would have to go back to a zinc or copper surface.

Mr. W. T. DILWORTH said the Meisenbach Company worked zinc only Commercially it was better and quite as quick as copper.

After other remarks, a vote of thanks was passed to Mr. Calmels.

Professor Falcioni, who was present, having showed a number of views of Pompeii, the meeting closed.

PHOTOGRAPHIC CLUB.

MAY 9,—Mr. M. Troup in the chair.

Mr. WEIR BROWN said he had promised to bring down specimens on Obernetter gelatine-chloride paper toned with combined bath, the formula

being that given by the Britannia Works Company for their Alpha paper. They were made prior to the autumn of 1891.

The prints were examined, and two or three had traces of degraded whites, but the others were as when finished.

Mr. JOHN HOWSON said, so far as his experiments had gone, the Alpha bath had no toning effect whatever on gelatino-chloride paper.

With reference to the stated acidity of mounting solutions, Mr. FRANK HAES said that he had tested his mounting solution, and found it neutral. It was a gelatine mountant.

The CHAIRMAN remarked that starch paste was so easily made that he preferred it.

Mr. HOWSON said that while starch was to be had he would not use gelatine.

ISOCHROMATIC PHOTOGRAPHY.

The subject for discussion being *Isochromatic Photography*, Mr. W. H. BARNES opened it, and said that isochromatic photography was receiving much larger attention now than when first introduced, but not so much as it deserved. No doubt the long use of ordinary plates had caused photographers to become accustomed to "incorrect colour rendering." From specimens he showed, it could be said that isochromatic plates would keep as long as ordinary plates of same rapidity. It had been said that an isochromatic plate was of no use, except in conjunction with a yellow screen. This, he pointed out, was a fallacious opinion, as could be seen by comparative prints shown. He then gave a short historical *résumé* of the subject, concluding this part of the subject by saying that it was distinctly due to Colonel Waterhouse that isochromatic photography had been brought to the state it is now in. He then showed photographs on ordinary and isochromatic plates of oil paintings, the painting itself also being shown. He remarked that the yellow screen was invariably used for copying paintings. Another pair of prints showed that, with an ordinary plate, distances were entirely spoilt; that is to say, they appeared to be on the same plane as nearer objects. Then followed photographs of flowers, three prints of same group: first, on ordinary plate; second, on isochromatic; and, third, on isochromatic, *with* screen. The second gave proper colour-rendering. With the screen, in third case, the colours were over-corrected. He said it was to be understood that, under all conditions (when photographing flowers), it was not to be supposed that colours would be correctly given, *but* the power was given the photographer to obtain them if screens of varying tints were used. In landscape photography the isochromatic plate was distinctly advantageous. Clouds could be obtained on the same plate as landscape, the distance was not spoilt, and colours in the foliage were correctly given. In pictures shown a medium screen was used, which increased the exposure four times. A question that much concerned professional photographers was badly illuminated subjects. One sometimes had to go out to photograph under conditions that would not be chosen. Here was shown the advantage of isochromatic plates. In portrait photography isochromatic plates were also advantageous, freckles on a boy's face being emphasised on the ordinary, whilst the colours of his cap—which was of blue and yellow cloth in rings—on the ordinary plate were reversed, the light yellow being very dark, and the blue not nearly so dark as the yellow. He then showed screens of varying tints, the first light, increasing exposure twice; the second medium, increasing four times; the third dark, increasing exposure six times. For satisfactory work, screens should be of optically ground glass. Gelatine could be used in the form shown (as a diaphragm), but this only with lenses fitted with Waterhouse diaphragms. With regard to dark-room illumination, the light must be through a ruby medium. For developing, any formulæ containing pyro gave equally good results on isochromatic plates as on ordinary plates. In summing up, Mr. Barnes said that Mr. Howson had given him one of the Britannia Works Company's booklets, and one remark therein he could emphasise and that was that isochromatic plates would, under all conditions, do all that ordinary plates would do, and in many cases very much more, Mr. Barnes having remarked that he used two thicknesses of ruby glass and sometimes three,

Mr. HAES said that he thought this very fact alone would prevent a very extensive use of isochromatic plates. In his own case he could not work in a ruby light.

Mr. FOXLEE was of same opinion.

The CHAIRMAN said ruby light made him squint.

Mr. HOWSON said that for all his work he used isochromatic plates, and yellow glass in his dark room. He made the remark, with great deference, for fear of misleading photographers. For an illuminant he used a candle, and he worked right away from the light, and to one side of it. To judge of the progress of the development, he examined the plate by reflected light from the distant wall of the dark room.

Mr. B. J. EDWARDS made some remarks on the subject of Isochromatic Photography, telling how he had been induced to go very deeply into it. He quite agreed that it was due to Colonel Waterhouse that isochromatic photography was what it is.

Mr. FOXLEE also said that Colonel Waterhouse was a very modest man, and had neither claimed nor received the credit that was rightly his due.

Mr. TOTTEM gave the following hint to plate-manufacturers for what it was worth, and that was to give a woodcut of the position of the source of light and the developing dish in the dark room showing how a yellow light could safely be used. From the fact that he had sold large quantities of non-actinic medium, he was of opinion there were a very great number of photographers who could not work in ruby light.

MANCHESTER PHOTOGRAPHIC SOCIETY.

MAY 10,—The President (Mr. J. Wood) occupied the chair.

The HON. SECRETARY read the awards in the competition classes at the exhibition of members' work held last month, as follows:—Landscape (over half-plate size): Mr. W. G. Coote, for *Cottage at Dean Row*. Landscapes (half-plate and under): Mr. O. H. Webb, *On the Rosa Burn*. Interiors: Mr. H. V. Lawes, *Youlgrave Church*. Instantaneous: Mr. S. L. Coulthurst, *Manchester Street Life*. Enlargements: Mr. J. W. Young, *The Dale, Alton*. Lantern Slides: Mr. H. V. Lawes, six slides, various subjects. Stereoscopic and *genre* pictures There being only one competitor for each, no award could be made, and there were no entries for either Home Portraiture or Scientific Photography.

The meeting desired to record the best thanks of the Society to the Judges, Mr. W. Artingstall (artist), Mr. J. W. Wade, and Mr. Geo. Wheeler (two local photographic amateurs), and a resolution to that effect was accordingly passed.

The principal subject before the meeting was a paper kindly contributed by Mr. J. Kidson Taylor, of Buxton, on *The Platinum Toning of Chloride Prints*. This, in the unavoidable absence of the author, was read by Mr. W. BLAKELEY. The paper was illustrated by a number of beautiful specimens, which fully testified to Mr. Taylor's success with a process which he had adopted after trying several methods for procuring pleasing brown or warm-toned photographs.

The meeting accorded a hearty vote of thanks to Mr. Taylor for placing the results of his experiments at the disposal of the members.

Croydon Camera Club.—An acceptable innovation upon the ordinary procedure at the fortnightly meetings was carried out on Wednesday, the 16th, when what was described as a "Rummage Sale" was held. The occasion drew together a goodly company of members, and a large assortment of photographic apparatus and prints, being marked at low prices, changed hands. A brisk trade was done in prints, those by Mr. Corden of local views (old Croydon) being in special demand. Altogether the evening was successful, both from a financial and photographic standpoint.

ON Saturday, the 19th, the seventh of this present season's photographic outings was held, the President, Mr. Hector Maclean, F.G.S., conducting the party to Merstham. In spite of the forbidding weather, the attendance was a full average one. The quaint "Church in the Park," the famous Marble Hall, and the lilliputian Town Hall having been inspected and pictured, Mr. Colman's forester escorted the members ronnd the Gatton "lake district," where a number of choice bits were picked out. High tea at the Feathers concluded an interesting but bitterly cold ramble.

Hackney Photographic Society.—May 15, Mr. A. Barker in the chair.—Work was shown by Messrs. Dean, Beckett, Newton, Roofe, Farmer, and Roder. Mr. CHAS. F. ROBINSON gave a demonstration on *Mezzotype Paper*, and explained its use as follows:—Mezzotype is a rough-surface silver paper, prepared to give broad effects resembling paintings. It is made in two grades; No. 1, very rough, and No. 2, medium rough. Printing is to be carried a little deeper than the finished print is required to be. On removing from printing frame, to get rid of the free silver salts, immerse the prints in a solution of common salt, ½ ounce; water, 1 pint. Allow to remain for about a minute, and then wash thoroughly to remove all salt from print. If this is not done, the subsequent toning will be uneven. If a very warm tone is required, the prints may be fixed without toning; but, if a toning bath is desired, the following are recommended:—*Gold Bath.*—Solution gold chloride (15 grains to ounce), ½ drachm; borax, 60 grains; water, 12 ounces. *Platinum Bath.*—Chloroplatinite of potassium solution (15 grains to ounce), ½ drachm; citric acid, 20 grains; salt, 30 grains; water 10 ounces. *Palladium Bath.*—Chloride of palladium (ordinary commercial solution), 15 minims; citric acid, 20 grains; water, 10 ounces. The platinum bath gives a good sepia, but the tone is colder than that produced by palladium. Care must be exercised that the paper is not over-toned, or an unpleasant tone may result, especially with gold. When the print leaves the toning bath, it should be of a reddish-brown colour. Fixing takes about half an hour in a bath of hypo 1 ounce, water 10 ounces. The final tone is only shown on drying. Washing should take about two hours, and the prints may then be dried between blotting-paper. Mr. Robinson also showed and demonstrated *Carlotype*. This is a card chemically hardened, rendered waterproof, and then coated with a gelatino-bromide emulsion. It is treated in precisely the same way as bromide paper, with the exception that, after the final drying, the work is complete, no mounting being necessary. Exposure for contact work is about twenty seconds, at three feet from ordinary gas flame. Amidol, or any suitable developer, may be used for developing. Final washing need not take long, as, on account of the hardness of the card and its waterproof nature, it does not become soaked with hypo solution. The carlotype is to be recommended as an expeditious method of obtaining finished prints.

Woodford Photographic Society.—May 17, the President (Mr. A. Wilmer) in the chair.—A paper was read by Mr. E. B. CAIRD on *The Dark Room and its Appliances*. He described a work room and dark room adjoining that he had recently fitted up for his use. In the former there have been fitted two large cupboards, one being kept for cameras, printing frames, and apparatus generally; a sink with hot and cold supply, with ordinary taps and valves and independent supplies, with swinging arms and sprinkler, a separate tap being inserted in the swinging arm itself, so that the supply can be controlled, in addition to the usual arrangements of the water being turned on by swinging the arm forward. A gas stove is useful for warming, and also for boiling water when required. Battens for hanging prints to dry are covered with sheets of cork, and others are arranged for supporting negatives while drying. In regard to the dark room, he said that it should not be dark, but sufficiently light to allow of working in comfort. The window has two frames, one of which carries two thicknesses of canary medium. The light is outside, but controlled from either room. This he had found safe for the most rapid plates, provided reasonable precautions were taken. For hyposulphite and alum baths a separate shelf was fixed, well away from the other working parts. The sink is fitted with a swinging arm and rose tap, a movable grate for resting dishes during development. Shelves just below window for bottles, measures, &c., are kept narrow, so as to only admit of one row of bottles. A light-tight draw is found very useful for plates, paper, &c., when filling slides, printing frames, &c. Clear labelling of all solutions is of great importance for successful working in the necessarily subdued light. For apparatus necessary or desirable, the lecturer recommended white porcelain dishes as preferable to any other kind; grooved baths for fixing negatives; large porcelain dishes for toning; card covers for dishes during development; thermometer for testing the temperature of baths, and another for room; clear glass measures, with the divisi n lines blackened in; funnels, scales and weights; washers for prints and negatives; grooved

wood and card boxes for storing negatives; printing frames; tin boxes for printing paper; glass for drying gelatino-chloride prints; cutting board for trimming prints; rubber bands, which can easily be cut from tubing with a pair of scissors; dusting brushes; squeegees; and cloths for drying shelves, dishes, &c.

Liverpool Amateur Photographic Association.—The fourth excursion of the year took place last (Whit) week, when several members journeyed to Ashbourne, for the purpose of photographing at Dovedale. Mr. J. H. Welch, the Hon. Secretary of the Association, was the leader. Dovedale was visited twice, and many extremely beautiful "bits" were obtained, the members being charmed with the grand scenery. Matlock was visited on Monday, but little work was done owing to the crowds of excursionists. Tuesday saw the party at Alton, and one or two pictures were taken of Alton Towers, the residence of the Earl of Shrewsbury. Here the members were met by Mr. Hugo Meynell and Rev. C. F. L. Barnwell, of the Uttoxeter Photographic Society, who kindly showed them round, and some good pictures were obtained. An enjoyable trip terminated on Tuesday, the 15th, when the party returned to Liverpool.

FORTHCOMING EXHIBITIONS.

1894.

July 14–29 ..... International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.

August 28 ..... Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.

Sept. 24–Nov. 14 ... Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.

Oct. 1–Nov. 3 ..... Photographic Salon. Alfred Maskell, Hon. Secretary.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BELITZKI PERMANENT REDUCER.

To the EDITOR.

SIR,—In your current volume, p. 240, "Vindex" makes inquiry in regard to the Farmer reducer, and the staining of the film thereby. Having been annoyed similarly, though predisposed in favour of this reducer, I have resorted to the Belitzki reducer. Starting out with the formula as given p. 884, ANNUAL, 1894, the inventor later introduced a formula suitable for use in connexion with the modern acid fixing baths, and since extensively published. The drawback, practically, is in obtaining or making the potassium ferric oxalate, and it occurred to me to prepare this as needed from the "solution of chloride of iron" as used in medicine, and which is easily and cheaply procured at the druggists'. It is also known as "Liquor ferri chloridi" in medical Latin, and is a solution of ferric chloride (perchloride of iron), prepared according to fixed standards of strength, and little liable to variation on this account. It contains 37·8 per cent. of dry ferric chloride. In using this salt, as below, there naturally is a by-product of potassium chloride, which does not in any way interfere with the action of the reducer. A working formula is as follows:—

Water	7 fluid ounces.
Sol. chloride of iron	2 fluid drachms.
Potassium oxalate	3 drachms.
Sodium sulphite (crystal)	2 ,,
Oxalic acid (about)	35 grains.
Sodium hyposulphite	1¾ ounces avoirdupois.

The solids are powdered (not necessarily the hypo), and the chemicals are added in the above order, dissolving one before adding the next. The colour reactions that take place are an amber colour when the iron solution is mixed with the water; an emerald green on adding the neutral oxalate of potassium; a ruby red with the sulphite of soda; and the original green restored on dissolving the oxalic acid; in fact, the oxalic acid is added little by little until this green colour appears, and, at the same time, the smell of sulphurous acid is perceptible. The colour remains the same after the addition of the hypo. It is desirable to filter finally.

The advantages of this reducer are that the solution is permanent, it is always ready, and can be used over and over again for a long time, keeping it in the dark; above all, it does not give rise to the occasional yellow stain as happens with the very excellent Howard Farmer reducer, but leaves the image unaltered in colour.

When the acid fixing bath is used, the negative can be transferred directly into the reducing solution without washing. It can be used for local reduction, of course, and I have never found it to fail either on negatives, prints, or lantern slides, gelatine or collodion.—I am, yours, &c., OTTOMAR JARECKI.

Erie, Pa., May 7, 1894.

P.S.—Touching the second question of "Vindex," I would submit that the hardness of the gelatine film, either inherent, or, as a consequence of the tanning action of the solutions with which it has been treated, affects the rapidity of reduction, likewise the dryness of the film. O. J.

KEEPING QUALITIES OF FILMS AND PLATES.

To the EDITOR.

SIR,—By the report on April 27 of a Camera Club Conference, I notice that one of the subjects of discussion had been *The Keeping Qualities of Plates and Films*, and that some special reference was made to the plates and films of Messrs. B. J. Edwards. My own little experience in this matter may perhaps be interesting to some amateurs who are placed with regard to photography in a similar manner to myself. For me more important duties may at any time oblige me to neglect photography for considerable periods, or I may require at any moment two or three plates of a particular brand for some special purpose; I wish, therefore, to feel sure that any packet of plates or films will keep well till I have need of some of them, and that, when I have opened it to take some out, the remainder will keep in like manner. To provide against being continually disappointed in this respect, I have, during the last two years and more, been making trials with very various brands of plates, both English and Continental. Recently I have been using B. J. Edwards's isochromatic plates and films (medium), and isochromatic plates (instantaneous), which I have had by me nearly eighteen months, using in the exposures the special factors which I had marked down when I first tried them, and I have not become aware of any deterioration in either plates or films. Two years ago, on various emergencies, I used plates which I procured from Messrs. Edwards in 1888, and every plate made me a good negative. I still have some of their instantaneous plates, procured at the same time, $7\frac{1}{4} \times 4\frac{1}{2}$, a size which I very rarely use, and I keep them by me, feeling convinced in my own mind that, whenever I need them, I shall find them quite good.

I appears to me, from my trials so far, that in general plates lose sensitiveness by keeping, but some much more than others. Indeed, I can quite conceive that many manufacturers, in supplying their numerous professional customers and the very many amateurs, who, in their outings or otherwise, use up a batch of plates at once, try rather to secure for them what they know they will value more than the keeping qualities. My trials for speed have not been sufficiently exact to permit me to say whether the Edwards's plates may have lost slightly in sensitiveness; but such a loss in any plates I should, in my landscape work, esteem of no importance compared with deterioration in other qualities, especially if I can become aware of it, so as to make allowance in the exposure.—I am, yours, &c., W. WASHAM.

May 14, 1894.

DEVELOPMENT OF ISOCHROMATIC PLATES.

To the EDITOR.

SIR,—In order to prevent any possibility of misunderstanding with regard to my remarks on this subject at the last meeting of the Photographic Club, I desire to give a diagram, as then suggested by one of the members.



D is my dark-room lantern, of which a *candle* is the only illuminant. A B is a square of deep yellow glass. C is the position of the developing dish, always kept three feet away from the lantern, and not in the direct rays of the light. I also keep the dish covered during the earlier part of the development.

As stated at the meeting, the use of a yellow light is not to be recommended, and it was only given for the benefit of several present, whose eyes, like my own, are intolerant of ruby light in any form. Most people can work with perfect ease in a ruby light, and for such, it is most desirable that they should use such light for working isochromatic plates.

In any case, the yellow light, if used at all, should be most carefully guarded by the several precautions mentioned.

I have met with many workers who begin to develop before their eyes have become accustomed to the semi-darkness of either ruby or dark

yellow light, and who, in consequence, fog their plates by working too near the light, or declare that such a deep light is impossible to work by. A little patience exercised after going in the dark room would show how clearly one can see in a dim light which at first seems perfect darkness.—I am, yours, &c.,

JOHN HOWSON.

SILVER IN COMMERCIAL GELATINO-BROMIDE PLATES.

To the EDITOR.

SIR,—The seeming unwillingness of the photographic journals to publish the results of Messrs. Haddon and Grundy's interesting and painstaking researches as to the amount of silver in the commercial dry plate of to-day seems strange to me when I look back a few years at the open-handed way in which many valuable hints and formulæ were published and commented upon to the benefit of all and sundry.

As an old dry-plate manufacturer, I have been looking out for this interesting table of results, to see if the present cheapness of the precious metal has added to the quantity of silver in the modern dry plate, as I fear that the pioneers of commercial plates give too much silver to the public and not enough to themselves.

FRANK MIALL.

13, *Shelgate-road, Clapham Junction, S.W.*

To the EDITOR.

SIR,—I am a member of several London Photographic Societies, of which I make use as often as opportunity offers, and from each I have always derived much benefit and pleasure.

In view of certain investigations recently made, but, alas! not published, it has been pressed home to my dull wit that possibly I may have been using the Societies, and paying for them, without obtaining full value for my subscription. This startling supposition needs much careful consideration and accurate investigation, and I think of addressing myself to the Secretaries of the several Societies, asking them to be good enough to supply me with information as to the number of their members, with the gross and net weight of each member attending each committee, general, and weekly meeting during the past two years. Such information, if carefully tabulated and carried out to three points of decimals, would, it seems to me, throw a vivid light on the weight of opinion expressed at such meetings, and would enable me to estimate, at a glance, how far the average weight is proportionate to the rate of my several subscriptions.

Of course, I feel that I might form my own judgment on this matter from my attendance at the various meetings; but, as such judgment would be (as I am informed) a mere rule-of-thumb judgment, and not scientific, it would be, I am afraid, of doubtful value in the eyes of scientists.

In my dilemma I come to you, Sir, for your kind advice, and would ask whether you recommend me to obtain a tabulated statement, and act on such information as I have indicated; or do you think that I may, without fear of reproach, be safe in forming an opinion as to the value of the Societies from the results I obtain when making use of their meetings?

I beg to apologise for putting my doubts before you, and am, yours, &c.,

May 21, 1894. JAY.

To the EDITOR.

SIR,—I am about to prepare a paper on the relative values of the various photographic publications, and should feel much obliged if you would supply me with the following data:—1st. How much per pound do you pay for paper? 2nd. Do you use first or second-quality printers' ink? Also I would like to know how much per pound you pay for the ink, and the amount of ink required to print each copy. At the same time kindly let me know how much you receive by sales and advertisements.

As photography is now becoming an exact(*ing*) science, I trust that you will spare no pains to give me exact and *prompt* replies to the foregoing questions, in order that I may be able, by tabulation of amount of printers' ink, &c., to help photographers in their choice of literature.—I am, yours, &c.,

A BUSYBODY.

May 18, 1894.

P.S.—I would add that the next subject I intend to tackle is photographic lenses, and am writing several leading houses for cost of glass and brass.

COPYRIGHT.

To the EDITOR.

SIR,—Anent the article by "Pioneer" in this week's issue of the JOURNAL on Section 7 of the new Copyright Act, the outlook is certainly a gloomy one for the profession, in fact, it's a case of, "I've got them on my list." As there will doubtless be a test case before long, the general custom of the profession will be brought forward, resulting, I should say, in a nominal fine being inflicted, which will ultimately lead to the removal, or, rather, modification, of this obnoxious section.

Whilst admitting that a photographer ought to be in a position to produce any work in its entirety to which he appends his name, I contend that, as far as photography is concerned, the present framing of the section is unworkable. I might suggest that the words "& Co." in addition to the name of photographer on mount, would obviate any legal proceedings, though I think that the sooner a test case is made, the better, as at present it is a veritable "Sword of Damocles."—I am, yours, &c.,

WALTER MORICE.

Marlborough Villa, Stanstead-road, Catford, S.E., May 18, 1894.

LONDON VISITORS TO THE CONVENTION.

To the EDITOR.

SIR,—Last year, by dint of personal exertion at the last moment, I was able to get a small party of Conventioners journeying to Plymouth a reduction in the railway fare of over 9*s.* each. Had I been able to secure the full number of ten persons, the amount saved would have been 10*s.* 8*d.* each.

This was accomplished by lying in wait at the booking office until the last moment, or rushing about like a cat on hot coals. Surely this year the matter might be managed in a more dignified fashion, and I ask you to insert this letter, so that the matter may be brought in good time before the London members of the Convention intending to put in an appearance at Dublin.

Will those ladies and gentlemen who, at present at all events, intend going, kindly communicate with me, so that it will be possible to organize a party. The reduction to Dublin should be even more substantial than that to Plymouth, but in these hard times even 10*s.* each is worth a little trouble.—I am, yours, &c.,

WALTER D. WELFORD.

"*Photographic Review of Reviews*" *Office*, 59 *and* 60, *Chancery-lane, London, W.C.*

INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT ARNHEM.

To the EDITOR.

SIR,—English exhibitors may be interested to know that the Committee have decided to accept unframed photographs, although, of course, framed pictures would be preferred. The unframed photographs sent in will be fixed to a neat mount at a cost of two florins (1*s.* 8*d.*) per square metre, unless they are mounted on a proper mount, or they can be framed on the spot, at reasonable cost, at the expense of the exhibitors. Applications should be sent in before June, 1 and forms can be obtained from me.—I am, yours, &c.,

ALB. KAPTEYN.

82, *York-road, King's Cross, London, N., May* 22, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Gotz's 7½×5 camera, slides, and case for whole-plate ditto by same or other good maker.—Address, E. SKIPPER, 60, Navarino-road, N.E.

Will exchange twelve Newman & Guardia's patent sheaths (quarter-plate) for twelve old pattern sheaths.—Address, THOMPSON, 53, North View, Heaton-on-Tyne.

Will exchange solid carved oak posing chair for old-fashioned 12×10 portrait lens or whole-plate rapid rectilinear lens.—Address, T. HAYWARD, 4, Exmouth-road, Southsea.

10×8 landscape lens, twenty-three inch focus, rack-and-pinion mount, by Horne & Thornthwaite; exchange for quarter-plate set.—Address, S. E. KELF, 189, Southampton-street, Reading.

Will exchange a Dallmeyer's extra quick No. 3c miniature portrait lens and photographic books for Dallmeyer's whole-plate rapid rectilinear.—Address, TOM COAN, 109, Caledonian-road, N.

Exchange forty lantern slides, many coloured, box of lantern colours, and wheel print trimmer for quarter-plate lens, retouching desk, or cabinet embossing press.—Address, GEORGE MOORE, Buckfastleigh.

Wanted, half-plate camera, good hand camera, or backgrounds, in exchange for pair very superior twelve-lens field and marine glasses; cost 4*l.*—Address, G. BROWN, Photographer, Ibstock, near Ashby-de-la-Zouch.

Rouch's 7½×5 camera, three book-form slides, with carriers, with whole-plate rapid euryscope, exchanged for 8½×6½ or 10×8 folding camera.—Address, T. BURROWS, 21, Ordnance-road, St. John's Wood, London, N.W.

Hand camera, carries twelve quarter-plates, two view-finders, time and instantaneous shutter, and indicator, and is covered in leather, will exchange for three double dark slides to fit Lancaster's "Le Merveilleux" quarter-plate.—Address, T. ROSTRON, 39, Featherstall-road South, Werneth, Oldham.

Will exchange THE BRITISH JOURNAL OF PHOTOGRAPHY, 1864 to 1893, thirty vols., all bound except the last two vols., and in excellent condition, for a modern whole-plate tourist camera, with three or four double backs, good rectilinear lens, and tripod.—Address, W. G. COOTE, Holly Bank, Ashton-on-Mersey, Cheshire.

Wanted 9×7 rapid rectilinear lens or No. 1 "Frena" hand camera, in exchange for Talbot & Eamer quarter-plate camera, three slides, walnut tripod, finder, and stained box.—Address, J. K. SMITH, Little London, Rawdon, near Leeds.

Prize and prize-bred pigeons (Jacobins), magpies, owls, &c., also prize-bred Columber Spanish bitch, broken to gun, and other dogs; exchange for studio camera and lens, backgrounds, &c.—Address, J. T. GORDON, Bethaven Lodge, Dunbar.

Will exchange 18×18 camera, wing extension, bellows body, screw adjustment, one single dark slide, for 12×10 or 10×8 tourist camera, with three double slides, or whole-plate camera and Ross rapid rectilinear lens.—Address, C. T. BELBIN, Islington Studio, Wenlock-road, Shrewsbury.

Handsomely carved lectern, upholstered in brown velvet, cost 6*l.* 10s., of Coussin's, Southport; also chair, upholstered in Utrecht velvet. Exchange the two for half-plate camera, three double backs, and Ross rapid symmetrical lens.—Address, C. T. BILBIN, Islington Studio, Wenlock-road, Shrewsbury.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. C. WARBURG.—See answer to "Senoj," whose query is similar to yours.

H. J. EMMENS.—Better communicate with the various firms of photo-mechanical workers.

VENTNOR has given neither name nor address; hence his query remains unanswered.

AN AMATEUR.—We have forwarded your letter to the persons interested. You will doubtless hear from them.

A. L. E. says: "Will you kindly tell me the address of a firm who make dry-plate boxes?"—Arundel & Marshall, Penn-street Works, Hoxton, N.

A. E. H. asks: "Can plates be sent through Trebizond to Persia without the authorities opening same?"—Perhaps some reader can supply the desired information.

THOS. M.—We cannot mention any of the colonies where there is a good opening for a portrait photographer. We believe the majority of them are overstocked already.

MAURICE J. GUNN.—We advise you to employ glass rather than any fluid in a cell for telescopic purposes. In regard to portrait work you certainly have achieved great success.

W. HOLMES.—The stop case seems intended for holding diaphragms to be used for landscapes, not for portraits, the back lens being laid aside, and the front one screwed in its place.

HOLMES BROS.—It will be impossible to pronounce upon the validity of the patent until the specification has been published. Possibly the mechanism employed may be different from anything previously made.

SENOJ.—Instead of using the portrait lens for the purpose, employ one of the rapid cemented class. But, previous to making a change, try the effect of a *much* smaller stop in the portrait lens, one equalling from *f*-50 to *f*-60.

YORKSHIRE says: "Will you please say how long the registration of a photograph (or anything else) lasts?"—We refer "Yorkshire" to the complete text of the Copyright Act, which will be found in our issue of April 27.

H. S. (Southampton).—The gold from old toning baths should be precipitated with sulphate of iron. Make a solution, and add a small quantity to the old solution. It is advisable to acidify the iron solution with sulphuric acid.

W. BASSETT.—The value is that of the plant and studio taken at valuation. The good-will, with such small returns, cannot be reckoned as worth anything. The profits upon it cannot be equal to the salary of an operator of fair ability.

S. S. P. C.—The gelatine must be allowed to swell to its utmost extent previous to taking a cast, and the superfluous water must be blotted off before applying the plaster of Paris. You must have allowed the gelatine to dry too much before making the cast.

H. HARRIS.—Your collodion has behaved just as ours usually does. There is nothing wrong with it, but you can impart a colour of any depth to it by dissolving in it a crystal of iodine. This may either be added to it direct, or be previously dissolved in a little alcohol.

PYRO desires to know what will remove pyrogallic acid stains from a navy-blue serge. We would suggest a strong solution of a vegetable acid—citric or tartaric—with alum; but, possibly, this may affect the blue colour of the serge. Can any reader suggest something better?

R. T. O.—The photogravure in question was, we believe, produced by the firm of Goupil, and it is copyright. To copy it in any form would be piracy, even as a lantern slide, without permission. Why not write to the firm on the subject? We cannot say whether they will allow it or not.

J. WILSON.—The supplementary lens should be of glass. One of five or six inches diameter can now be obtained at a small cost.

ALUM.—If you find the developer made according to your formula answers so well, there is no reason why you should not continue to use it in any establishment in which you are engaged. The only end to be attained is the production of good negatives, and these you say you secure. Then why change?

OPALINE.—The trouble is air-bubbles imprisoned between the print and the glass. If this is the case, they can be avoided by greater care in the mounting. As you do not say the method followed, we cannot indicate where the fault rests. Possibly the solution of gelatine is too strong; that would increase the difficulty in the operation.

NON PLUS.—The only way to utilise the room is by having one or more reflectors to soften the light from the windows. In such a room a skilful worker can produce very good bust or three-quarter length portraits, but it will not, without considerable alteration, make a good studio for general portrait work, such as professionals have at times to undertake.

C. WILSON.—The plan most generally adopted by professionals in making reversed negatives is to take them with the mirror. The objection to taking them with the glass side of the plate next the lens is that any imperfections in the glass, such as air bubbles, &c., would be reproduced in the image. However, the plan is sometimes followed for the rougher kinds of process work.

ZINCO.—Zinc plates can be purchased ready for use at any of the dealers who supply lithographic and general printing materials. It will be found more economical to purchase the zinc than to planish it for oneself—that is, if the experimentalist's time is of value. It would take up too much space to describe the method of preparing plates, suitable for process work, from the zinc supplied by the metal warehouses.

T. W. asks the strength of a saturated solution, and whether a ten per cent. solution is what is meant by a saturated solution?—A saturated solution is one containing as much of the salt as can be dissolved in it, and that, of course, depends upon the solubility of the particular salt. A ten-per-cent. solution is of a definite steength; that is not the case with saturated solutions, as they vary with the temperature.

SAM MASSY.—1. Better get a manual on electrotyping. It is a subject which does not come within the province of a photographic journal, even if space could be found for it, which is not the case in this column. 2. The relief is quite high enough for all purposes, but it is not at all too high. 3. As the development was so long, it would seem that the gelatine tissue had become somewhat insoluble, possibly from being kept too long before use.

C. WALSH says: "I have often seen it recommended to give prints one or two washings in warm water in order to increase their permanency. The other day I washed a couple of dozen or so of P.O.P. prints in warm water, with the result that the whole of the pictures washed away. What was wrong? Is it only prints on albumen paper that should be washed with warm water?"—Yes. If gelatine prints be treated with hot water, the result will be as experienced.

S. R. C.—There certainly can be no harm in your appealing, but we very much question whether the appeal will be allowed. The new studio seems to be a separate and distinct building, erected for business purposes, and we see no reason why it should not be rated to the parish like other premises. However, as we have said before, no harm will be done by appealing. We can offer no opinion as to whether the proposed rating is exorbitant or not, so much depends upon circumstances.

PURPLE asks for a formula for a toning bath that will give rich, dark tones on albumen paper. He says: "I have tried several, but can only get a dirty red-brown colour and woolly prints. I have tried the acetate, carbonate, phosphate, and lime baths, but none of them are any good. What do professionals use?"—On good paper any of the baths named will yield deep, rich tones, provided the negatives are sufficiently vigorous. Unless that be the case, no bath will give a deep purple colour. The tone of a print depends more upon the character of the negative than upon the composition of the toning solution.

NEW SUBSCRIBER asks: "1. Is seventy degrees a wide enough angle for general use, or would ninety degrees be much better? 2. How can a lens give different angles by altering the diaphragm fixed at the optical centre of the lens, the plate remaining the same? 3. How is it that a lens having an equivalent focus eight and a half inches gives an angle of seventy degrees on an eight-inch plate? I have seen a lens catalogued as doing this."—In reply: 1. An angle of seventy degrees is more useful than one of ninety. 2. Altering the position of the diaphragm does not alter the angle. 3. There must be a mistake; such a lens will *not* include an angle of seventy degrees on that size of plate.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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THE NEW ASTRONOMY.

In the new astronomy the lens of the telescopic camera and the sensitive dry plate are to supersede the lens and retina of the human eye.

Those who listened to Sir Howard Grubb at the Royal Institution on Friday last, and may have had a lurking doubt of the superiority of the former method of observation over the latter, must have had all doubts dispelled when witnessing, almost in juxtaposition, carefully executed drawings made ocularly by a noted astronomer on the one hand, and, on the other, the same subjects depicted by the photo-telescope. The frequent bursts of applause which interrupted Sir Howard in that assembly of "grave and reverend seigneurs" and astronomers must have convinced him of their entire sympathy with him in his remarks concerning the astronomy of the future.

Described in a nutshell, the contrast between the old and the new astronomy, not taking into account the enormous influence of the spectroscope, amounts to this, the eye, being limited in its light-grasping power, can, even with the largest and most perfect telescopes, see only such objects as, humanly speaking, are visible. Duration of the time of observation reveals nothing originally unseen; but, when the photo-telescope is brought to bear upon these objects and kept pointed at them for one or more hours by means of delicately adjusted clockwork, then, by this persistence of vision in the telescope, stars altogether invisible even to the cultured eye of the astronomer are depicted on the photographic plate, and the longer the exposure given the greater is the number of those invisible objects that are portrayed on the plate. Hence, whereas with an exposure of only a few minutes the brighter of these seemingly minute celestial bodies are depicted, the increasing of the exposure to several hours will bring many more into photographic, and ultimately into visual, view. What the limit of this penetration into space is to be who can tell?

Sir Howard's plea was for such perfection in the construction of the telescope, and especially its mounting, as to render it absolutely an instrument of precision, to an extent sufficient to retain a star on the cross hairs of the telescope for many hours without deviating in the slightest degree from the position primarily assigned to it, for it is only in this way that minute stars can impress themselves without being distorted or duplicated.

For driving the telescope, a clock of the kind employed in the standard instruments of the International Photographic Survey was shown in motion. It was exquisitely finished, and, having to drive a telescope of large dimensions, it was necessarily large, and was electrically controlled by a standard pendulum suspended at a little distance. The reason of this independent control being necessary was explained to be that, although this clock would go well and smoothly, and keep good time from second to second, it could not be depended on to about one second in six hundred; but, as it is necessary, or at least desirable, to be able to depend on the clock for longer periods than this, while no error of more than one-twentieth of a second can be permitted, it is evidently necessary to supplement this by control from an independent pendulum which can be relied upon to the required amount of accuracy.

In illustration of this, an effective experiment was shown. Two bells, differing in their sound, were placed on the table, one electrically connected with the standard pendulum, and the other with the clock. Both struck simultaneously for a considerable time, until Sir Howard intentionally introduced a slight error in the latter, by which the simultaneity was disturbed, and gave way to a ding-dong sound. But the telescope clock, as though it had been a sentient being, seems immediately to have discovered that something was wrong, and, by means of mechanism at present unknown to us, increased its rate, automatically reducing the half-second of introduced error so rapidly and well that, in less than twenty beats, simultaneity was restored, and the *duo in uno* clang went on as before, with monotonous regularity. It is evident that a clock so perfect in its mechanism as to do this must be regarded as a most powerful factor and all-important aid to the astronomer who desires to give long exposures, in which the measure of success depends upon an amount of displacement of the subject less than a hair's breadth. Let it also be borne in mind that the telescopes of which we are now speaking are large ones, weighing, not unfrequently, several hundredweights.

With regard to the condition of the atmosphere when stellar photographs are being made, it is not a little gratifying to know that, as has been stated by Dr. Gill, in the *Observatory* of recent date, after a certain period of exposure it is quite immaterial whether the atmospheric definition is good or bad; the photographic images of stars will be equally sharp in either case. That good measurable pictures can be taken on nights when refined eye observations of any value are impossible is a very remarkable fact, and one that, *à priori*, would probably be deemed unlikely. The explanation given by Dr. Gill is what we have frequently given in these pages as lateral halation, or a conversion of luminousness into dimension.

The influence of aperture in a telescope, as distinct from magnifying power, is one which interests every possessor of a telescope, whether it is to be used for ocular or photographic observations. Sir Howard, basing his remarks upon a statement made four years ago by Dr. Common, who, he said, gave a very neat explanation of the fact that a certain amount of magnification of image is required in order to see a certain

amount of detail in that image, said that a similar explanation might be given of the different character of the image given by large-aperture telescopes and small. The image of a star, as given by a telescope's objective, is not exactly a point; it is, owing to certain physical reasons, in the form of a small disc of light, which, if the image is of a sufficient brilliancy, is surrounded by diffraction rings. The diameter of this spurious disc depends, amongst other conditions, on the diameter of the object-glass, the larger the diameter of the object-glass, the smaller the diameter of the disc; in other words, the discs, as seen in large object-glasses, are smaller than those seen in small object-glasses; or, putting it in another way, if a certain size of object-glass be found to give a spurious disc of a certain size, reducing the aperture of the object-glass will increase the size of the spurious disc.

Much more of an exceedingly interesting nature relative to the mounting of telescopes for photographic work will be found in the report of Sir Howard's lecture in another column and, we may add, in *Knowledge* for May.

UNIFORMITY IN DEVELOPMENT.

The Chemicals.

We have now to deal with the last moiety of our subject, quite as important to consider as the first. We believe that our constant efforts to deprecate the "pinch-of-pyro" style of recipe have played no unimportant part in displacing so unworkmanlike a system by apportioning the constituents of the developer, and at this stage we would emphasise our previously expressed views, and say, that to secure uniformity all chemicals will be most satisfactorily kept for use in the state of solution. The strength in which they are made is quite immaterial, though it is well to avoid excess of strength on the one hand, and too great dilution on the other. Taking pyro as a standard favourite, it need not be said that it is so soluble as to lend itself to any possible requirement as to strength, while hydroquinone and most of the more recently introduced developing agents can only be dissolved in slight proportion, even when at saturation point. Saturation, however, though a great favourite—in name—with many is not to be recommended, if for no other reason than the uncertainty attending it under normal temperature variations. And, as to the method of always keeping a store of crystals at the bottom of the vessel holding the solution, it must be said that the utmost uncertainty attends the method. In the first place, if a fresh quantity of solution be made, a considerable time has to elapse before saturation can be considered to be arrived at, and much loss of time in the necessary repeated shaking of the bottle is experienced. Further, the effect of temperature is equally as potent a factor of uncertainty as in the former case. As an example, sulphite of soda solution may be taken. If water be saturated with this salt in summer time, say even at no higher a temperature than 65° Fahr., there would be found, if the temperature were reduced, say, to 40°, that a large crop of crystals would become deposited at the bottom or sides of the bottle, and they would require very considerable and frequent agitation at a higher temperature before resolution would take place. Hence it is by far the better plan to make solutions of known strength, and that well below saturation point.

We will not here obtrude our own views upon the question whether the alkali and the bromide solutions should be kept separate or mixed, or the bromide and the pyro, &c., mixed, for it does not touch the question of uniformity, and we do not desire to over-burden our topic with too many restrictions.

In making pyro solutions, a little acid is always desirable in addition to the use of sulphite, but the same acid, acetic, citric, or other, should always be employed and always of the same strength; no "few drops of acetic acid," or crystals of citric, and so forth. The reason of this restriction is that, though no influence on the colour of the solutions is made by very varying proportions of acid, a very important effect is produced by the proportion of alkali neutralised and rendered virtually inert by the acid. If a larger proportion is used at one time than another, the proportion of alkali in the developer also varies, and this would be fatal to certainty or uniformity of result.

We enter with some diffidence upon the question of the colour of the negative as influenced by pyro; but, if it be remembered that the purpose of these articles is to deal only with the one question of uniformity, the most ardent advocate of yellow tones as an aid to printing quality cannot be offended. Therefore let us say at the outset that we advise, with this object in view, the use of a maximum proportion of sulphite, so much that, when using the utmost possible quantity of alkali, no trace whatever of yellowness shall be discernible. This is an essential point, because, while uniformity cannot possibly be obtained with negatives varying in colour, some slightly, some deeply yellowed, according as more or less alkali may have been used, there can be no room for doubt when the same tone is presented by every plate alike.

Our remarks will be concluded when we have dealt with a consideration little discussed until quite recently—the temperature of the developing solution. Those who are ignorant of the effect this factor has upon developing operations should make similar exposures upon two plates, and develop one with a cold and the other with a warm solution. The effect will appear remarkable. Hence, whatever the temperature that is considered best for the purpose, it should be adhered to. Perhaps sixty-five is as good as any. Taking water either from a tap supplied by waterworks or from a running stream, it will rarely exceed, and usually will be below, this. Every dark room should be supplied with a thermometer; eighteenpence or two shillings will purchase a sufficiently accurate one. Then, when developing operations are about to be undertaken, the water for mixing with the stock solutions may be kept in a separate vessel, the temperature taken, and more or less as needs be hot water added till the thermometer, after being moved to and fro, indicates sixty-five degrees. In ordinary practice it will not be possible to have the stock solutions also at a uniform temperature, but this may be disregarded, as the effect on the bulk of the finally mixed solution will not be more than a degree or two. We are acquainted with some operators who adopt this method of heating, and who are loud in its praises. In conclusion, let us say that uniform lighting, uniform strength of solutions, a maximum of sulphite, and uniform temperature are the main factors in obtaining uniformity in development.

Picture Exhibitions.—Lovers of art can enjoy themselves to their heart's content just now. Probably at no previous period have so many pictures been on show in London as at the present time. Notwithstanding the large number of Exhibitions now open, the majority of them, from the Royal Academy downwards, are daily crowded with visitors. We are told that a considerable number of copyrights have been disposed of to foreign publishers, though, of course, English publishers have secured many of the most valuable ones.

An Innovation.—At the last meeting of the Croydon Camera Club, what may be termed a novel feature in photographic societies (though, we believe, it is not quite new) was introduced, namely, what is described as a "Rummage Sale" amongst the members, and with very satisfactory results. The example will, no doubt, be followed by other societies. Many persons at times find themselves in possession of apparatus and appliances for which they have no further use that would be exceedingly useful to some of their fellow-members at a reduced price, or by barter. An annual "Bazaar Night" might prove an attractive and useful feature in many societies, but the dealings should be strictly confined to the members, or the Society might have its status lowered to that of a trading concern.

Colour Blindness.—In his recent lectures on Colour Vision at the Royal Institution, Captain Abney dwelt at length on that form of colour blindness said to arise from the too free use of tobacco. As a rule photographers are more or less smokers, and we know some who have very imperfect colour vision. How far that may be due to smoking we cannot say. We do know, however, that some who may even be termed inveterate smokers have a very keen perception of colours. Artists, too, are rather noted for their habit of smoking while at work. Probably the effect of smoking on the vision is largely dependent upon the temperament of the individual —some may be influenced, while others are quite unaffected. So it is with photographic chemicals, such as the bichromate of potash, cyanide of potassium, and some of the new developing agents, and some can work with them continuously without injury, while others, even with a limited use of them, will suffer inconvenience. By the way, if we mistake not, we have more than once seen the learned Captain indulging in the "fragrant weed," so that there is probably no reason why moderate smokers should be alarmed.

Gelatine Mountant.—Reference was made, at the Photographic Club, two weeks back, to the acidity of some of the cements sold for mounting purposes, particularly those with gelatine. Mr. Frank Haes mentioned that he had made a mountant with gelatine, water, alcohol, and an antiseptic a year ago, and it was still good and free from acidity, but it was made with a fine sample of English gelatine. Now, a gelatine mountant is a very excellent one in many ways; it is easy to use, does not cause cockling of the mount if carefully made and applied, and affords more protection to the print from an impure mount than most other cements do. The cement, however, must be made with good gelatine—not necessarily an expensive one—free from acidity, and not such as is frequently used for the commercial cements. The majority of foreign gelatines—even the best—are acid, while those of English make, as a rule, are neutral. A high-class gelatine is not suitable for the purpose, as it sets too quickly when applied, and will not bear the admixture of much spirit without precipitation. A pure gelatine of low quality is best —such as those sold as soup gelatines. The best kind we know is Nelson's "No. 2 soluble." It is cheap, and will take a large proportion of spirit in its solution. We have kept a mountant made with this gelatine for several years, with no other antiseptic in it but the spirit. Usually, however, a little thymol, oil of cloves, or other antiseptic is added, as a preservative.

Demonstration on Photogravure at the Photographic Club.—The demonstration on *Photogravure*, recently given by Mr. H. Wilmer at the Photographic Society of Great Britain, will be repeated at the Photographic Club on Wednesday, June 6. Tickets of admission may be obtained from any of the members, or by sending stamped envelope to the Hon. Secretary, Mr. James A. Sinclair, 26, Charing Cross-road, W.C. The following is the syllabus of the demonstration:—1. Class of negative and transparency most suitable, reversed transparency required, masking, &c. 2. Printing of negative, resist, tissue most suitable, time of exposure, and precaution necessary in developing same on copper; trial resist necessary to determine exposure. 3. Copper plates; quality; cleaning the plate. 4. Description of grain employed, and the function of the grain; graining box; precaution necessary to avoid damp; methods required to control character of the grain, and to obtain even deposit. 5. Heating the grain on the copper plate; colour by reflected light an important guide as to when sufficiently heated. 6. Drying off the developed resist by artificial means or spontaneously; the latter necessary where a resin grain is used; varnishing and forming protected margins. 7. Preparation of etching solutions; best strengths to use; neutralising the etching solution. 8. Etching; the solution to be used determined by inspection of trial resist; time of etching. 9. Cleaning off the film; finishing of plate ready for printing. 10. General remarks.

Merchandise Marks Act.—A question was put to the President of the Board of Trade, in the House of Commons on Friday last, with reference to the import of foreign-made goods, and the answer given was certainly not in accordance with the general idea of the reading of the Act. It appears that several tons of bottles, made in Germany and stamped with an English name upon them, and no indication that they were made abroad, were being unloaded in London, and the question was, Is this an infringement of the Act? Mr. Burt, in reply, said that the Board of Trade were informed, by the Commissioners of Customs, that the bottles in question did not bear marks which constituted an infringement of the Merchandise Marks Act. In reply to a further question—as there was an intimation on the bottles that one farthing deposit would be charged—Mr. Burt said it did not follow that, because an English name was on a bottle, therefore that bottle was of English manufacture. This evoked considerable laughter. It was not illegal; it would only be illegal to represent that the article had been made in England. If this answer is the correct reading of the Act, which many doubt, there seems to be no reason why foreign-made photographic apparatus should not be imported bearing English makers' names, or photogravure prints without the imprint, "Printed in Germany" or "in France." Probably some other questions on this subject will be put in the House, and the answers will be looked forward to with interest by importers of foreign goods and others.

HOW "P. O. P." IS WORKED AT ILFORD.

Any new process or improvement upon an old one that appeals to the general body of photographers for adoption, seems as if fated to have to fight its way through a protracted preliminary stage of difficulty and incertitude in practice. As a rule, we may safely conclude that this is due least of all to the novelty of the process, its variations upon former methods of working or its inherent peculiarities, for all observation and experience tend to show that the most fruitful cause of failure is to be traced either to a neglect to master working instructions or to a disregard of them. A case in point must readily present itself to our readers. The early history of the gelatine dry-plate process is partly a record of photographers' troubles and non-success with the then new negative method, due, we are aware, in a large measure, to the causes we have already assigned, and more recently we have observed that history has been disposed to repeat itself in the cases of some of the latest printing processes, notably gelatino-chloride.

If, during the period of three years that it has worthily occupied the place of probably the most popular printing method of the day, gelatino-chloride has not succeeded in displacing albumen to a greater extent than has been the case, the fault, we are sure, is not with the process, but is due to the carelessness and ignorance which so many photographers bring to bear in their manipulations. By such, indeed, gelatino-chloride does not have justice done to it. As bearing upon this deduction, we may say that quite recently the Britannia Works Company showed us a number of prints on gelatino-chloride paper, which had obviously been treated in such a manner as to exhibit gelatino-chloride printing in its worst possible aspects. The whites of the prints were discoloured to the all-too-familiar yellow, while the weak and impoverished appearance of the actual images was such as to raise a doubt whether any gold had been deposited upon them. Others, again, that had been kept for a

period of a few months had reached the final stages of fugitiveness. Whatever the precise causes of this may have been—whether inadequate washing between the various operations, or a condition of toning bath hostile to the deposition of gold—certain it is that, as examples of what could be accomplished on gelatino-chloride paper, they were no recommendation of the process. To be placed against such "awful examples," however, numerous prints were shown us, which were the perfection of purity and brilliancy of image, and richness of tone, some of them having been kept in photographers' show-cases for periods of upwards of a year without apparently undergoing the slightest degradation or change. Indeed, as we write, there is before us a print on Ilford P.O.P., made nearly two years ago by Mr. Midwinter, of Bristol, and that has since been lying on the editorial table, which is as perfect as the day when it was made.

Given proper treatment in the printing, washing, toning, and fixing of gelatino-chloride prints, absolutely no reason exists why yellowed whites, imperfect tones, and subsequent fugitiveness should supervene; and it was in order to observe the ease and simplicity with which such drawbacks can be avoided by adherence to the explicit instructions given for working Ilford P.O.P. that we recently accepted an invitation of the Britannia Works Company to witness the production of gelatino-chloride prints by the method in daily use at Ilford. It is this method that is recommended by the Company for working the paper, and which, if carried out, cannot but lead to successful results, alike favourable to the process and to photographers themselves.

We should here say that each daily make of P.O.P., whether glossy or matt, is subjected to two printing tests, and the results of these tests to a large number, and extending over many months, were shown us, and their uniformity and excellence of purity and tone were very noteworthy. The prints, when taken from the frames, are first of all thoroughly well washed, until all traces of milkiness have disappeared from the wash water, which is constantly changed. Next comes immersion in the alum bath (a five per cent. solution) for a period of about five minutes. The prints are herein placed back to back, and kept constantly in motion in the solution. This hardens the gelatine, and enables subsequent working to be conducted with a greater degree of confidence. It may be well if we say now that our description generally applies to both the matt and the glossy papers. After the alum solution has done its work, another ten minutes' washing is administered to the prints, so as to prevent any trace of the alum finding its way into the toning bath.

We now note a small but important point in connexion with the toning of the prints which may be of use to our readers in assisting them to obtain regularity and uniformity of tones on the paper. It is that the experienced printer of the Ilford Company conducts the toning of the prints entirely by artificial light. The printing room is darkened, and a gas jet used for judging the progress of the prints, thus obviating the uncertainty and variation which must necessarily attach to daylight. The toning bath employed is the sulphocyanide one, used in the following proportions:—

Gold chloride	2 grains.
Ammonium sulphocyanide	30 „
Water	16 ounces.

As regards the quantity of gold used for P.O.P., in practice it is found that a proportion of one and a half grains per sheet is necessary, and the batch of prints we saw toned took up the gold exactly in that proportion. The progress of the toning is judged by transmitted light from the gas flame, the deeper shadows of the print being scrutinised, and when these have passed the warm stage then are the prints sufficiently toned to yield a good final purple colour. Any addition of gold to the bath is accompanied by sulphocyanide solution, and a toning bath is not used a second time, but when done with is placed aside for residue purposes. The toning is effected in ten minutes, both with the matt and glossy papers. Washing in several changes of water follows the removal of the prints from the toning bath, fixation being then accomplished in a solution of hypo (3:20) for a like period of time. The final washing is allowed to be of two hours' duration, the water being frequently changed, and the prints are then ready for drying, mounting, &c.

Here, then, in brief, is the method we saw in actual use at Ilford for the production of large daily batches of prints on matt and glossy P.O.P., the fine qualities of which, seen in very considerable numbers made over a lengthy span of time, sufficiently attest the value of the method in obtaining uniformly good results—pure in the whites, vigorous and rich in the tones, deep but transparent in the shadows, and delicately but brilliantly gradationed in the half-tones and lights—such prints, in short, which, if produced by the profession at large will, while complying with every artistic requirement, appeal, above all, to the popular taste, and are, therefore, the best calculated to do both present and future justice to the photographer and the process.

Finally, we would say that the moral to be drawn from the foregoing is, that failure may be avoided and uniform success assured by (1) the copious and unstinted use of washing waters in the various operations following the printing of gelatino-chloride prints; (2) the constant and unvarying employment of a sufficiency of gold, that is an average of $1\frac{1}{2}$ grains for each sheet or 16 cabinets, in the toning bath; (3) the use of fresh toning solution for each batch of prints; (4) toning by an invariable light; (5) perfect fixation of the unaltered salts; and (6) complete and perfect final washing. In other words, follow the instructions of those best qualified to know how the paper should be worked—*i.e.*, the makers, and the process will do all the rest.

THE DEVELOPMENT OF THE ASTRONOMICAL TELESCOPE.

At the weekly evening meeting of the Royal Institution of Great Britain, held on Friday, May 25, William Huggins, Esq., D.C.L., LL.D., F.R.S. (Vice-President), in the chair, Sir Howard Grubb, F.R.S., F.R.A.S., discoursed on this subject to a crowded audience. In the course of his lecture he said: I do not propose in this lecture to discuss any of the interesting astronomical and physical problems that have been opened up by the adoption of the "New Astronomy," as it is aptly called. I leave these subjects to be dealt with by those who have made such their special study, and are better qualified to speak of them.

I propose to-night to discuss the differing conditions which astronomical instruments are required to fulfil under the new system as compared with the old, and to point out the possibilities that appear to exist for improvement and future development, touching only on the astronomical part of the work so much as may be necessary to explain the instrumental equipment required.

It would be well, perhaps, that I should first call to your recollection some of the chief lines of work which have been opened by the introduction of the new photographic method.

The International Photographic Survey of the Heavens has been undertaken by sixteen of the principal observatories of the world, which have agreed to co-operate in producing two series of photographic pictures of the entire heavens; the first series including all stars down to the eleventh magnitude, a catalogue of which is to be formed from the photographic plates; while the other series will include all stars to the fourteenth magnitude, and will be photographically reproduced as a chart.

The enormous advantages of photography for this work, as compared with the old system, has been brought so often and so prominently before you by Dr. Gill and other lecturers, that it is unnecessary for me to dwell upon them here. As a supplement to this international work we have the independent surveys of Dr. Gill and Professor Pickering, taken photographically with short-focus lenses on a small scale.

We have also the recording by the aid of photography of specially interesting objects, star clusters and groups, comets, &c., and more particularly very faint objects, such as nebulæ, which require long exposure. The results in this field of work demonstrate, perhaps, more than any other, the powerful agent that photography becomes in the hands of the astronomer. It is not necessary to go into any detail in considering this work, the results of which are tolerably familiar to you. It is only necessary to mention the names of Draper, Common, Gill, the Brothers Henry, Roberts, Gothard, Barnard Russell, and Dr. Max Wolf, to indicate how much we owe to long exposure photography on these objects.

Of new minor planets, thirty-three were discovered by photography in 1893, and several lost planets were rediscovered.

We have also the study of the parallax of fixed stars and of nebulæ by this means, as carried out by Rutherford and Jacoby in America, and Professor Pritchard at Oxford, Sir Robert Ball and Professor Rambant at Dunsink, and Dr. Wilsing at Potsdam.

Turning to spectroscopy, we find again the enormous importance of the photographic method. The development of Fraunhofer's original idea of a slitless spectroscope has given us the objective prism of to-day, and with this instrument we are able to simultaneously photograph the spectra of several hundreds of stars on a single plate, these spectra being available for study at leisure, so that they can be classified and selected for future work and more crucial examination and investigation. The results from a single plate are more accurate than could possibly be given by months of very close observation by the older method. The Draper Catalogue, which we owe to Professor E. C. Pickering, of Cambridge, Mass., gives the spectra of over 10,000 northern stars obtained in this manner. In addition to this he has in preparation a similar catalogue of the southern stars. The beautiful photographs obtained by Professor Lockyer at South Kensington, in which the detail is so fine that the spectra can be enlarged to give a length of five feet, show the great value of this method for complete study of the spectra after the first rough cataloguing. With the slit spectroscope equally important work has been done in the "New Astronomy." Not only can we get the spectra of celestial objects with comparison spectra of terrestrial substances on the same plate, and thus investigate the chemical and physical constitution of these bodies, but by the adaptation of the beautiful discovery of Dr. Huggins we can detect and measure the motion in the line of sight, the photographic method giving far more accurate results than can be obtained by visual means. In the hands of Dr. Vogel, of Potsdam, this spectrographic method has been used for nearly fifty stars, and he is only waiting for a larger instrument to further extend this work. We have also in this connexion the discovery of spectroscopic double stars, stars so close that we cannot hope to see them double by any possible optical means, and yet of which we know sufficient by the aid of photography to calculate their masses, distances, periods and rates of motion with considerable accuracy. In this work Professor Pickering, at Cambridge, Mass., and Dr. Vogel, at Potsdam, led the way, but Father Sidgreaves, at Stonyhurst, has extended the work by his beautiful analysis of the variations of the spectrum β Lyræ.

Lastly may be mentioned the work of Professor Hale at Chicago, and on the photography of solar prominences and faculæ with the spectro-heliograph. In this apparatus, instead of using the full light of the sun, only light of one-wave length is allowed to act on the plate. There are several methods of accomplishing this, but the latest form is an ordinary spectroscope, with a metal plate to receive the spectrum, a narrow slit being arranged in this plate to select the particular wave length in which it is desired to work. The photographic plate is behind the second slit and in the image formed of the spectrum, and is fixed in position. The whole spectroscope is given a motion such that the front slit passes over the image of the sun formed by a photographic object glass, while the selecting slit moves at the same rate in front of the photographic plate. A complete picture of the prominences, chromosphere and faculæ of the sun is thus obtained, and, by an ingenious adaptation of clockwork, Professor Hale has been able to make his apparatus automatic, and to set it to take thirty-six plates of the sun at any desired interval of time between each without any superintendence whatever from the observer in charge. Mention may be made also of the extension to the study of solar spots, lunar and planetary detail by photography, and many other departments of astronomical research too numerous to mention, but not having any special interest for us at present in their bearing upon the instrumental arrangements.

Every one of these branches of work has already been not only suggested, but put into actual practice, with more or less success; but, as usual in the inception of such work, there are many lessons to be learned from the first few years' experience. The most evident fact, and one easily learned from any one of the various branches mentioned, is that the utmost perfection is necessary in the apparatus which enables the telescope to follow the object to be photographed. Before enumerating the various points necessary to be attended to to ensure this accuracy, perhaps it would be well to explain why this increased amount of accuracy is necessary when using the photographic method of observation. In the older methods it sufficed if the star remained on the wires of the micrometer during the actual observation, which rarely lasted many seconds; and, even if the star did move off the wire, the observer could see that it did so, and would move up his wire again to the star, repeat the observation, and would not record it unless he was satisfied that all was right at the moment of bi-section.

In the photographic method, however, the record of the observation is not that of any one moment; it is the aggregate of all the impressions made every second and every part of a second during the exposure. The photographic plate, unlike the eye, takes note of and records every position of the star image, and not the one selected position, as the eye does; hence you can easily see the great necessity of having the utmost possible perfection in the clock-driving arrangements.

This condition of perfection is popularly supposed to be satisfied by having a perfect clock, but there is hardly a portion of the instrument that can be mentioned the perfection of which does not contribute in some way or other to the accuracy of the motion.

1. The instrument must have a stability far beyond what is necessary for ordinary work, otherwise the very handling of the slow motions will sensibly affect the positions of the images, and injure the results.

2. It is evident that the axis on which the instrument revolves must be of extreme accuracy, otherwise the instrument will not move truly.

3. The anti-friction arrangements must be of the most efficient nature, in order to give the clock a fair chance of doing its work.

4. The slow motions must be extremely perfect, as otherwise it will be impossible to bring the guiding star on the cross wires of the "guider" with that accuracy necessary for the best results.

5. The arrangements, even for the adjustment of the instrument, so far, at least, as the placing of the polar axis parallel to the pole of the earth, must be such as to enable the observer to make this adjustment with an accuracy not at all necessary for visual observations.

Professor Rambant, Royal Astronomer of Ireland, has recently shown that whereas for ordinary visual work it suffices if the polar axis of a telescope be adjusted in altitude and azimuth with an accuracy of one minute of arc, errors of a few seconds of arc only are allowable with a photographic telescope, and that this great degree of accuracy is best obtained from measurements of the photographic plate itself.

An instrument, therefore, that is required to give the best results used photographically, should be made with a view to such work in all its details from the very beginning, for an instrument that may be excellent for ordinary observations will most probably break down under the stringent conditions necessary for the more modern work.

In the usual form of mounting it is necessary to reverse the instrument when observations have been made on a star as it passes from the east to the west of the meridian. This is a great disadvantage in photographic work, and in designing the new twenty-six-inch photographic telescope, which Sir Henry Thompson has undertaken to present to Greenwich, I have arranged to allow complete circumpolar motion so that this reversing on the meridian will not be necessary, and the telescope will follow any star through the whole of its path in the heavens so long as it is above our horizon.

(*To be continued.*)

PERSPECTIVE AND THE SWING BACK.

[North Middlesex Photographic Society.]

The subject I am to speak about to-night is one upon which it would be difficult to say anything new, and I certainly cannot pretend to do so. In addition to the information given in the text-books upon perspective, optics, and the practice of photography, scarcely a week passes without an article on some point of perspective as rendered by photography appearing in one or the other of our photographic journals, and yet, I believe, there are many photographers who hold erroneous views with regard to perspective and the use of the swing back.

The average amateur, I suppose, takes up photography in the first instance with no very definite views as to the nature of the work he is about to commence. Later on, when he finds himself involved in difficulties, he begins to read the technical journals. Presently he meets with a letter written by some minor artist, attacking photographic perspective in good set terms. Our beginner has possibly forgotten all he was ever taught of perspective, and when he finds one of our leaders demonstrating the correctness of the photographic image with scientific accuracy, and the artist retreating from the combat with the dogmatic, but unsatisfactory, assertion that photography does not reproduce the forms of things as he sees them, he (the beginner) jumps to the conclusion that his pictures will be correct in form, no matter how he uses his tools, and that a knowledge of perspective is unnecessary to him. I hope to-night to show the fallacy of this idea, and to induce those who have not yet made a study of perspective (if any such are here) to devote some little time to it in the future. In justice to the artist, it is necessary to look at the subject from his point of view. No doubt, all art students go through a course of perspective, but, as they advance in their profession, it is necessarily the case, from the nature of their work, that they cease to plot out the perspective of their subjects, and trust to the correct training of their eyes to make this good. Indeed, it would be tedious and unsatisfactory even if it were possible to plot out the foreshortening of the more irregu-

larly shaped objects which the artist has to portray. Correctness of drawing is always important, but the soul of the painting is seen in the rendering of subtle beauties which the ordinary observer fails to grasp, in the treatment of atmospheric conditions, in the massing of lights and shadows, in the grouping of the component parts, and the harmony of the colours. If these have been skilfully dealt with, we are apt to overlook imperfections of drawing and slight lapses from the laws of perspective. It follows that, while the painter retains in his mind the broad principles of perspective, and applies them in his work, he is likely to forget many of the minor rules, and the methods of demonstrating them, and, when challenged to support some opinion he has given, is not prepared to defend his position with that ready scientific knowledge which the optician has at his command. And yet the artist's statement, that the photographic image does not show forms as he sees them, may be in some instances undeniably true. It may be assumed that the image formed by a rectilinear lens upon a plate with its surface at a right angle to the axial ray is as correct as any drawing upon a flat surface can be; but, if the axial ray of the lens be not truly horizontal, the eye will be offended with what appears to be an aberration from truthful drawing in objects which are perpendicular to the ground plane, such as buildings, &c.

If the eye is directed to a point on the horizon, all objects which present flat surfaces at right angles to the line of sight will diminish in size the farther off they are, but will remain unaltered in form. Surfaces which, not being at right angles to the line of sight, recede from the observers, will diminish in size as they recede, and, if bounded by parallel lines, these lines will, in the case of a horizontal surface, appear to converge to a point opposite the eye, or, if the surface slope up or down, the lines will converge to points above or below the line of sight. A knowledge of the laws of perspective enables the draughtsman to place the foci of these retiring lines with unerring certainty. Let a negative be made of certain stationary objects, let the observer stand with his eye in the position previously occupied by the lens, and hold the negative at a distance equal to the focus of the lens in front of his eye. The image on the plate will now exactly coincide with the objects beyond. From this it will be seen that it is desirable that a photograph should be viewed from a distance equal to the focus of the lens with which it was taken, otherwise the perspective will appear to be false. So far the photographic image is true to nature and agreeable to the eye, but, as the majority of small photographs are made with lenses of foci ranging from four to ten inches, and as the normal distance of viewing small objects is about sixteen inches, it will be seen at once that a photograph made with a short-focus lens cannot be viewed from the same distance, and when seen at the ordinary distance, which may be three or four times the length of the focus of the lens, the perspective will appear strained, and an artist would be justified in saying that the lens did not show the image as he saw it. If this is clear, let us take another case. Let the eye or the lens be directed upward, to include the top of some tall building. The point of sight will then be above the horizon and the face of the building will no longer be at a right angle to the line of sight, but will recede obliquely from it. As the face of the building is now a surface receding from the station point, the lines which bound it will no longer appear parallel, but will appear to converge to a point above the point of sight, and, if a negative is made under these conditions, the building will appear as a truncated pyramid. The drawing will be correct, but will not be agreeable to the eye, for this reason, from earliest infancy the eye has been unconsciously trained to recognise rectangular objects as such, even when viewed obliquely by raising the eye, and we see not what the eye actually records, but what the brain tells us is correct. If any one doubts that the eye does actually see the building narrower at the top than at the bottom, let him gradually approach the building, keeping his eye fixed on the parapet, and a point will be reached when the view presented will be so unusual that the brain will no longer refuse to recognise what the eye sees, and the building will be seen of a pyramidal form. In viewing a photograph taken under these conditions, we are startled by the converging lines, and that which is actually true appears false. With a view to correct this discrepancy, the swing back was devised. By drawing the bottom of the back away from the lens, the rays forming the top of the building are allowed to diverge until the sides of the building are parallel. The image will now appear correct, but the angles of view will be wider and identical with a portion of an image cut from the margin of an image formed by a wide-angle lens on a much larger plate, supposing the camera to have been carefully levelled. As a matter of fact, the whole scheme of perspective has been altered, the lines have been raised or lowered, extended or reduced, as will be seen in the series of prints I show. The first six are photographs of a flight of steps, taken under different conditions. No. 1 was taken from the top of the flight with the lens pointing down. It is a fine specimen of drunken architecture. The point of sight is in the centre of the print, and the lines of the steps, &c., converge to an accidental point some distance above the line of sight. It was made with a four-and-a-half-inch lens upon a quarter-plate, and includes not more than an agreeable angle of 49°. In No. 2 the back has been swung to bring the vertical lines parallel. In No. 3 the lens was lowered to the bottom of the camera ($7\frac{1}{2} \times 5$), while the plate was raised till the bottom edge was half an inch above the centre of the lens. The lens was carefully levelled, and the back set perpendicular to the horizon. Although the angle included on a quarter-plate, with a four-and-a-half-inch lens, is only 49°, as in No. 1, yet, as the point of sight is four and a half inches above the base line of the print, and as the eye should view it from that point, it is in effect a piece cut from the margin of a print nine inches high and including 90°—a very wide angle indeed. If we now examine No. 2, we will find, by plotting out the perspective lines, that the point of sight is also four and a half inches from the bottom of the print, which is, once again, a piece cut from the margin of a larger print, nine inches high, and including, as in No. 3, an angle of 90°. In fact, Nos. 2 and 3 are identical, and cannot be distinguished from each other. They are really wide-angle views, the perspective is strained and much altered from No. 1. Prints 4, 5, and 6 are of the same stairs, looking up from the bottom, are varied in the same way, and explain themselves. As lowering the lens in one instance, and swinging the back in the other, produce identical results, it is obvious that for certain effects we may either use the sliding front to bring the lens to one or the other side of the camera, or swing the back upon its vertical centre to obtain the same result. I mention this, as it has been stated that there is no correct method of using the lateral swing.

These peculiarities are most noticeable in architecture, and, being readily seen, can be easily controlled. In landscape they are less noticeable, and may result in falsities. If we desire to photograph a hill, and point the camera upward, keeping the back at right angles to the lens to facilitate focussing the foreground, the height of the eminence will appear greatly reduced, and a road or path winding upward will seem to be on nearly level ground. To secure the due effect of height, it is desirable to use a long-focus lens, which will cut off the objects in the foreground and so bring the back to a vertical position, thus lowering the point of sight and slightly increasing the angle of view. In making a photograph of objects in a hollow or valley at our feet, it is again necessary to keep the back vertical, but in this case a short-focus lens may be useful to include some of the objects in the immediate foreground and so accentuate, by contrast, the diminished size of those in the valley. When working on level ground, the plan of swinging the top of the back away from the lens to bring near and far objects into focus is a most objectionable practice, the result being neither true nor agreeable. The swing back and the rising and falling front judiciously used will do much to preserve truth in our work, but in cameras of ordinary make the latitude allowed in these contrivances is seldom sufficient for difficult subjects. A camera having an adjustment similar to that of Watson's Acme, by which the baseboard can be tilted to a great angle while the front and back, having independent movements, can be set either perpendicular to the horizon or to the baseboard, will be found of great service. In place of this a lens mounted as the one I pass round may be used. It is mounted on trunnions, which allow it to be turned upon its optical centre to a very considerable angle. As the frame is square, it can be set in camera front with the centres either vertical or horizontal, and the small bellows allows of free movement without admitting light into the camera. Without such an arrangement I could not have made the prints 2 and 5 identical with 3 and 6. They would have differed to about the same extent as the two halves of a stereoscopic print, and for the same reason. Such an arrangement, used in conjunction with the rising and horizontal movement of the front, will overcome many difficulties. A photograph of an interior, taken with a short-focus lens giving a wide angle on the plate used, will, when viewed at the normal sight distance, give an unpleasant appearance of strained perspective; but, if the photograph is enlarged till the focus is sixteen inches or so, the strained appearance vanishes, and we may almost feel as if we were inside the room. Prints 7 and 8 will illustrate this point. It is for this reason that the image thrown on the screen of the lantern is so much more pleasing than a small direct print from the same negative.

I may state here that, when the plate is set square to the lens, the axial ray will indicate the point of sight; when the plate is set obliquely to the lens, the point of sight will be found at the spot where a line drawn.

through the optical centre of the lens at a right angle to the plane of the swing back touches the plate. In all cases the swing back should be set perpendicular to the horizon.

Even in landscape the use of a short-focus lens (not necessarily of wide angle) will have a bad effect, and the constant use of such lenses will tend to debase our pictorial judgment. Prints intended for mural decoration should either be taken with lenses of not less than fifteen or sixteen inches focus, or enlarged until they can be viewed at those distances. A little while ago an etching was exhibited in the course of a lecture given to this Society, and a remark was made in the discussion following that the trees in the middle distance were larger in proportion to the bushes in the foreground than a photograph would show them. I do not know if it was meant that the etching was untrue to nature, or only that a photograph could not give the same effect. In either case I cannot agree with the statement. The distance of the camera from a foreground object will determine the comparative size of that object in the print to one of the same or other size some distance farther off. If we are close to a foreground object, it will appear many times larger than the distant one, but by retiring the camera we shall reach a spot when the two objects in the print will show little difference in size. The series of prints I pass round will illustrate the point. No. 9 is a view taken with an eight-inch lens at thirteen yards from the sapling in the foreground. The sapling appears quite as tall as the much larger tree a little behind it. The distant bushes and trees are mere dots. No. 10 was taken with a lens of a little over sixteen inches focus at twenty-six yards' distance. The sapling is about the same size as in No. 9, but the neighbouring tree is much larger, while the distance objects now form conspicuous points in the landscape. No. 11 was taken with a three-and-a-half inch combination at fifty-two yards' distance. Although the sapling is still the same size in the print, it is dwarfed into insignificance by the trunk of the adjoining tree, which is now so large that a small portion only of it is seen in the print, and the tufts of grass, distant bushes, trees, &c., are now so large that, on a cursory inspection, the print would not appear to be of the same subject as No. 9. I am aware that many photographers hold the erroneous opinion that distant objects are always dwarfed in proportion to foreground objects when a short-focus lens is used, and that a long-focus lens will reverse the conditions. So long as this error exists, it cannot be too frequently stated that the length of focus determines the scale of the image, but has nothing whatever to do with the perspective, which is settled by the position of the camera in relation to the objects, and the dwarfing of the distance is due to the inclusion of objects too near to the camera, generally by the use of a wide-angle lens. To enforce this, I show No. 12, a view of the same subject taken with the eight-inch lens at twenty-six yards. Compare this with No. 10. Although much smaller, the comparative sizes of objects are the same as in the larger print, and, if enlarged to the same size, would be identical with it. No. 13 was taken with the eight-inch lens at fifty-two yards, and, though not much larger than a postage-stamp, is identical in all its proportions with No. 11. From this it will be seen that, if you want a picture of, say, a hill towering over the cottages nestling at its foot, you must retire till the objects are in proper proportion, and, if you have not a lens of long enough focus to make the selected subject fill your plate, you must be contented with a small image, which, if carefully focussed, will bear enlargement to the required size. I do not think the main body of photographers quite appreciate the value of the tele-photographic lens for such purposes.

In the lecture just referred to we were cautioned against making combination prints, and, to show that even the great masters were not free from errors in introducing figures into landscape, an engraving of a picture by Rubens was exhibited, in which some figures were introduced much too large for their surroundings. The painter has many advantages over the photographer; he is not tied to the points of sight where he stands, but can paint his picture from a point nearer to or farther from his subject. He can alter the positions of objects, or omit them, and introduce others as he pleases; but in doing this he is liable to errors of judgment in estimating the sizes to which these objects should be drawn. The photographer who understands the laws of perspective and the properties of his lenses can, by taking certain precautions, work with absolute certainty in this respect. No. 14 is a copy of No. 9. I have drawn the horizon line at the height which the lens was above the base of the print, and the point of sight is in the centre of that line. The horizon line is prolonged across the mount on the left-hand side to a distance of eight inches from the perspective, eight inches being the focus of the lens. From the perspective, I draw a line obliquely downward to the base line, touching the root of the sapling, and another obliquely to the right, passing through a white spot, which is a piece of paper I placed on the ground at a measured distance of twenty-four feet from the sapling. A line drawn parallel to the base line at any distance into the picture will be twenty-four feet long between the points where it is cut by the retiring lines from the extremities of the twenty-four feet standard. Taking this standard as our basis of measurement, we can now proceed to set out any other distances we may require. To show the method of using it for other measurements, I have extended the standard base line to the right, till it represents thirty-six feet, and from that point I draw a line to the distance point on the left. At the point where that line cuts, the left-hand retiring line is thirty-six feet into the picture. From the point of intersection, I draw a line to the right, parallel to the base line, until it reaches a line drawn from the perspective to the thirty-six feet mark on the standard base line. We have now a rectangular space enclosed within these lines (that is, rectangular on the ground, but not in the print), having a length of thirty-six feet on each face. From this, it will be seen that it would be easy to indicate tennis courts on a lawn when no such lines existed in the negative. If you have, in another negative, a figure standing at a known distance, and taken with the same lens, you can determine with precision the point in the landscape where such a figure may be introduced. I say advisedly taken with the same lens, for, if the figure was taken with a lens of different focus, it would be necessary to reduce the subjects to the terms of a common denominator. For instance, if the landscape were taken with an eight-inch lens, and the figure with a four-inch lens, it would be necessary to enlarge the figure two diameters before it could be used with propriety. At the right hand of the print I have erected a line at a right angle to the base-line standard, and of the same length (twenty-four feet), and I have subdivided it into convenient lengths. This will enable us to fix the height of objects in the print. A line is drawn from the bottom of the upright standard to the perspective, and another from the six-feet mark, also to the perspective. A vertical line between these two retiring lines at any position is six feet high. I show such a line at a point the same distance into the print as the sapling is, and you will observe that a six-feet figure at that position is one and a half inches high. Should you, for any reason, wish to work with great accuracy, you can check the correctness of your work by calculating the height which such a figure would be when photographed at that distance from the lens. The rule may be stated shortly as:—Divide the distance from the lens to the object by the focus of the lens, and divide the height of the figure by the dividend, less one. The result is the height which the figure should be at that distance. In the illustration given the supposed figure is thirty-nine feet from the lens, and I believe you will find that the height of the line is as nearly as possible correct. In combining such figures, it would be most improper to take a figure from the right hand of the negative and print it in on the left hand of another, or even in the centre of the print. It should be at a distance from the axial ray of the lens approximating to that which it occupied in the original negative, and the direction and quality of the lighting should be the same in both subjects. Some manipulative skill will be necessary to effect the combination successfully. Cast shadows will be particularly difficult to manage, but the real troubles will be encountered when combinations of interior work are attempted. In such subjects, the lighting of the objects composing the picture is modified by the reflections and shadows cast by each other, and it was to such subjects, probably, that the lecturer meant his caution to be applied. The difficulties are so many and so subtle as only to be successfully overcome (if overcome at all) by one who is capable of painting the entire scene and no one who could do so would hamper himself with the limitations incident to photography.

Returning to landscape photography, atmospheric perspective is a phrase which confuses some of our younger workers. It implies, of course, the separation of the different planes in the picture by the haze which is always present to a greater or less degree in the air, and cannot be measured by the rules of perspective, as it varies with the state of the weather. Clouds, however, are subject to the same rules as terrestial objects. No one here would think of photographing the clouds at the zenith, and introducing them into a landscape, but I think we are not always sufficiently careful in placing our clouds at the proper distance above the horizon. In the first place, the clouds should be taken with a lens of the same focus as that used for the landscape. We were told the other day that a print in which this rule had been broken, had received commendation. Such faults may occasionally escape attention, but Judges and critics are "kittle cattle to shoe behind," and it is wise not to trespass too much on their forbearance. The direction, strength, and quality of lighting should be the same in sky and landscape, and it would be improper to combine clouds taken from the top of Snowdon with a view taken from the Broads, but the altitude of the clouds is so great

that no difference can be seen in the perspective of clouds taken from the ground line and those taken from the attic window. In all cases the horizon should be included in the sky negative, or, if this be impossible, its position should be marked for future reference. The camera should be levelled, and the horizon may be brought near the bottom of the plate by use of the rising front. The clouds may be used, either for horizontal or vertical landscapes. When the horizon is visible in the landscape or sea piece, the greatest care must be exercised to bring the horizon lines exactly together. The clouds there are so small that an error of only one or two degrees will be noticeable, and it is particularly annoying to see a cloud dipping behind and cut in two by the horizon. When only a narrow strip of sky is visible above, tall foreground or middle-distance objects, a little more latitude is permissible in adjusting the clouds, though, even then, the two horizons should not be far apart. As we commonly take clouds with a smaller aperture than we use for landscape, it is desirable to soften the definition of the former in making the combination. It has been suggested that the clouds should be printed through the glass. In addition to reversing the clouds, which is not always desirable, I consider the amount of colouring so introduced too great for most subjects. A piece of cut celluloid, from which a waste negative has been cleaned, will give the necessary degree of softness. When the clouds have to be repeated in a sheet of water, it is, of course, necessary to turn the negative, and in this case the blurring will not be objectionable.

It has been suggested to me that I should explain why and when it is desirable to take a view with the camera close to the ground in order to foreshorten the foreground. The point has often been dealt with, but at the risk of wearying you I will give a typical instance. Imagine yourselves looking at one of the upper reaches of the Thames, an eyot with tall trees is on your left, the far bank slopes gently to the water. In the meadows beyond—towards the middle distance—and near the right of the view, are one or two cottages, the faint line of distant hills bounds the prospect. At our feet the grass is broken into irregular patches, and a tall clump of water flags or bulrushes is on the extreme right. Focus the view with the camera at the usual height. If you include the foreground you cut off the sky, and the subject is divided in two by the broad stretch of uninteresting river; cut off the foreground and you have a narrow strip of picture sandwiched between the white sky and the white river. In neither case is the view worth taking. Now retire a step or two, lower the camera within a foot or two of the ground, raise the sliding front to cut off the superfluous foreground, and mark the difference. The water is reduced to a a mere strip broken by the taller tufts of grass and dock leaves. The clump of rushes give strength to the right-hand side, and the distance is thrown still farther back by the bold foreground. Water meadows, fenland, and the foreshore of tidal estuaries may with advantage be dealt with in the same manner.

I have now exhausted the time at my disposal, and probably the patience of my audience. If what I have said has convinced any one that a knowledge of perspective and of the influence upon it of the swing back will not only enable us to avoid errors, but give us greater freedom in our work, I may claim to have not altogether wasted the time of the Society.

J. McIntosh.

THE DARK ROOM AND APPLIANCES.*

The lighting, as at present arranged, I do not consider all it should be, and I hope some day to communicate some better arrangement to the Society.

For ventilation, a three-inch pipe through the ceiling and between the joists of the floor above to the outside wall of the house, where a grating is fixed. As long as the wind does not blow on to this grating, the arrangement is satisfactory; but when such is the case, the wind tends to come down. To counteract this, I propose to fit a fan, driven by an electric motor.

Racks for dishes, &c., can be arranged under the shelf at sides of sink.

The dark-room door is fitted with one of Kaye's push and pull locks. To enter from the work room, the slightest push on the knob opens the door, whilst to get out from the dark room a pull with one finger is sufficient. This arrangement is very convenient when one's hands are occupied with dishes, &c., or even when they may be wet with solutions.

For storing stock solutions in large quantities, bottles known as Winchester's, having either wide or narrow necks, fitted with corks or stoppers, are convenient.

Hock bottles do well for some things, being of good colour, but they do not pour well. Old pyro bottles are useful for storing hypo or sulphite, but the corks should be well fitting, and rendered as air-tight as possible. All bottles should be clearly labelled what they contain, and the strength of solutions noted on the label. It may save time to also note the formula used, or quantity of solution to be used in certain cases.

For developing dishes I prefer white porcelain. They are easily kept clean, and I think the progress of development can be more easily seen. Films developed in black vulcanite dishes have sometimes to be fished for, as they get as black as the dishes they are in, and in the fishing process the film is liable to be damaged. Wooden dishes, with glass bottoms and a well at one end, into which the developer runs when the dish is turned up to the light to examine the density of the negative, may be useful and liked by those who are accustomed to them; but with them the picture can only be examined in one position, *i.e.*, with one end of the plate downwards. In my own experience I have more than once, when using such a dish, inadvertently turned it round to see a picture better, and have consequently poured off the developer into the sink. An accident of this sort, especially if no more ready-mixed developer is at hand, does not tend to improve one's temper, to say the least.

Clear glass dishes with balls for feet are to be avoided. On developing a film in such a dish there appeared three round spots arranged in a triangle, like a pawnbroker's sign. For some time I could not account for the marks, and only after careful investigation was it discovered that the marks corresponded with the position of these ball feet of the developing dish, which must have so concentrated the light on the film, when being examined through the dish, as to leave the marks found. A deep white dish answers well for the alum bath, and where only one plate or film is to be fixed at a time, a similar dish does for the hypo bath; but, where several plates are to be fixed at once, a trough with grooves to take two sizes of plates is useful. They, however, take a lot of solution to fill them, and are a little hard to keep clean.

For fixing quarter-plate roller-film negatives I now use a gallipot or jam pot, as large as possible in diameter and not too deep. After development, treatment in alum bath, and a good rinsing under the tap, I bend the films to a U form, film side inwards, and pop them in the gallipot of hypo, where they uncurl and lie against sides. Two quarter-plate films or more can be treated at once. Dishes in which four quarter-plates or lantern slides can be developed together are sometimes handy and useful if the exposures are about equal. Dishes for toning should be large enough to easily keep the prints moving, and for half-plate should not be less than $12 \times 10\frac{1}{2}$ inches.

Covers for developing dishes, &c., are very useful, and can be easily made of card or straw board. The sides should be, I think, deep enough to rest on the table—that is, as deep as the dish. I use such covers in developing, fixing, and alum dishes, and, when the covers are on, feel quite safe to open the dark-room door to go out if I desire. A chair of convenient height to comfortably handle dishes during development is a desirable adjunct to the dark room, and a thermometer on the wall to indicate the temperature of the room, and another for ascertaining that of baths and solutions are also advisable.

Glass measures, graduated to minims, ounces, &c., are essential. I find the ordinary glass ones best, and the graduations are made more easily visible in dull light by being gone over with a sharp-pointed black-lead pencil. Opal glasses I have tried with black markings, but found them less easily seen than those treated as above.

For large quantities of solutions graduated glass jugs are useful. Glass funnels, too, must not be omitted for filling bottles or filtering solutions. A stand with rings for supporting the funnel should be provided. Scales and weights are necessary. That type of scale usually called French, having flat pans with the system of levers concealed in the base, is very good and not very expensive. I find mine very sensitive, as half a grain will turn the scale, and I can weigh up to four pounds at least.

Washers for negatives and prints are almost a necessary part of the outfit of every photographer. For negatives (glass or cut films) I use a circular zinc trough 10 inches diameter by $8\frac{1}{2}$ inches deep, having a syphon pipe fitted outside to draw off contaminated water at bottom. For water supply I use a short rubber tube, one end having a Royles union, is slipped on one of the water taps, and the other end laid against inside of the trough and resting on its edge, so that the stream of water rushes round its sides. With this washer I use Hinton's racks of suitable sizes for the plates to be washed. These racks I like, and find them very convenient, and, moreover, they hang up close against the wall when not in use, and occupy little space.

For print-washing and washing roller-film negatives I use a washer called, I think, the "Wonder." It is a horizontal cylinder with flat ends, the opening on top is formed by part of the side of the cylinder being

* Concluded from page 330.

cut away, and is 11½ × 10 inches. Two jets, branching from one inlet pipe ⅛ inch diameter cause a rapid circulation of the water, and with it the prints to be washed, whilst a light shield plate over the jets prevents the prints coming in contact with them and being torn. There is a well at the bottom into which the contaminated water falls, and from which it is drawn off by a syphon pipe outside. This size of washer acts well for sizes up to quarter-plate prints, but is rather small for half-plate and I hope to find or construct a more satisfactory washer by-and-by.

For string negatives boxes with groves are used, either wooden or cardboard with metal groves, such as Arundel and Marshall's. Tylar's negative storing envelopes take up less room, and also permit of easy arrangement and registration, whilst various useful information can be noted on the envelope. For roller-film negatives thin envelopes are useful, or storage albums having pockets for each negative, each bearing a number, and having an index provided.

Printing frames need little description, but the best I have seen are those of Scovell of New York. They are beautifully made and have the frame carried across the ends same depth as at sides, thus preventing light passing through the edge of glass negative and diffusing itself on the edge of the prints. The rebate holding the glass should be levelled off towards the opening for the picture to avoid shadows on the edge of print, which are so often found there. The backs and springs and fixings of the frames above referred to are so neatly fitted that there is little chance of the print shifting when opening the back for examination. Beck's metal frames I have found useful for quarter-plates, and especially for thin films, as the paper and film, as well as the sheet of glass and blotting-paper backing are held securely whilst the whole picture can be examined.

Printing paper and untoned prints are conveniently kept in light-tight tin boxes, which can now be had either with or without a receptacle on the end of the inner tray for chloride of calcium. A flat piece of tin, having a bent spring in its back, keeps the sheets of paper in close contact when the box is closed, and the deep lid prevents any passage of light.

Pieces of polished or ground glass, preferably plate glass, are used for drying gelatine chloride prints. To get enamelled or matt surface, the ground glass should be finely ground, and both sorts must be free from scratches or blemishes. Enamelled metal plates and plates of vulcanite or celluloid are now also, I believe, to be had for this purpose.

To dry prints that have been squeezed on to glass, I prop them up against a board, supported on edge, on the floor in front of the gas stove at about two feet distance (paper side next the stove), and find that they usually dry in less than half an hour. Allowing a free current of air by opening the door and window aids the drying.

Glass-cutting shapes are often devised for trimming prints. These are necessarily of definite sizes, and sometimes are neither quite square nor have their sides quite parallel. I have found a cutting board I got at Messrs. Adams' very useful, and shall try to describe it. The board is square, 10 × 10. At top edge a handsome straight edge is partly let into the surface of the board and allowed to project above the surface about ⅛ inch. On the right-hand side a strip of glass is let in level with surface of the board. Over this glass, but only covering it about half its width, is a strip of brass having its right-hand edge at right angles to the lower edge of the hard-wood straight edge. This brass strip is held by a screw at each end, but not rigidly, as spiral springs on the screws tend to keep it from contact with the glass strip, so that a print can be passed between them. On the left-hand side of the board is a brass rod, also at right angles to the straight edge at top, and in this a light brass T square sides.

To use this board a print is placed face upwards, and any vertical or horizontal line is arranged in line with the little T square, whilst the edge of the print that is to be trimmed off projects past the right-hand side of the vertical brass strip. This having been adjusted, the brass strip is pressed firmly down on the print, and the projecting edge cut off with the knife. This cut edge is now turned round and placed carefully against the straight edge at top, and the second side is trimmed and so on. The prints may be cut to any size, and very little trouble or time is occupied in the operation.

A shoemaker's click knife is a very good one for trimming with, and preferable to roller cutters.

Brushes of various sizes and shapes for dusting negatives, &c., developing, &c., must be included in necessary appliances, as well as squeegees, both roller and flat, and a plentiful supply of soft cloths, for drying hands, dishes, &c., are also essential. These should on no account be such as to give off fluff of any sort, and should be reserved absolutely for use in the photographic department, and carefully washed separately from household linen.

Rubber bands are very useful, and those cut in flat rings are not nearly so good or strong as those cut from tube. Flat tube can easily be bought of any size, and bands of any desired width are easily cut with a pair of scissors. Bands can thus be made at a very nominal cost.

I fear I have already wearied you with the length of this paper, which has, of necessity, embodied much that is already well known to you all; still, I felt I must touch on the various points I have referred to, and I am sure there are many more that might have been mentioned These may find notice for some future occasion, but for the present I have trespassed too long on your forbearance. Should I have been able to bring anything new before you, or have succeeded in further interesting any of you in endeavouring to more efficiently equip a dark room, I shall feel amply rewarded for any trouble I may have taken in preparing this paper, and I shall feel very grateful for any suggestions of improvements or criticism the members may give on the arrangements of rooms I have had the pleasure of laying before them.

E. B. Carlo.

ON THE RELATION BETWEEN THE HEIGHT OF THE CAMERA AND THE POSITION OF THE HORIZON.

[Wilson's Photographic Magazine.]

An American photographic periodical pointed out some time ago the advantage that there often is, in the case of landscapes, in lowering the position of the camera so as to bring the point of view down to that commonly adopted by artists, who generally work sitting on a camp-stool.

There is no doubt that there often is an advantage in as low a point of view as this, or sometimes even a lower; but, in his further remarks, the writer went astray in stating that the result of adopting so low a point of view was to bring the horizon to one-third of the distance from the top or the bottom of the plate. I forget whether he stated that it raised or that it lowered the horizon, but that is of no consequence, as the mere alteration in the height of the camera barely alters the position of the horizon at all in most cases; in scarcely any case will it alter it so as to bring it within a third of either the top or the bottom of the plate.

Of course, much depends on what we mean by horizon. Many people consider that the word should only be applied to the distant line dividing sea and sky, whilst the astronomer's horizon is, in some cases, a plane tangent to the earth at any particular point, in others a plane parallel to such a plane, passing through the earth's centre. Etymologically, however, the word merely means a boundary, and it is quite allowable, in connexion with all pictorial work, to take it as the bottom boundary of the sky as we see this latter. This makes the horizon at times include quite near objects, and in this case the height of the camera does, to a great extent, determine the position of the horizon on the plate.

Let us take the case of a sea horizon first. In this case the height of the camera has no appreciable effect on the position of the horizon, unless the height be enormous. Mount Everest approaches 30,000 feet in height.* In a photograph taken from such a height, with a lens of ten inches focus, the plate being vertical and the lens being central with its axis horizontal, the horizon line would be a little more than one-quarter of an inch below the centre of the plate. With a height of 1000 feet it would be about $\frac{1}{10}$ of an inch below the centre of the plate; in the case of a height of 6 feet it would be less than $\frac{1}{250}$ of an inch below the centre of the plate.

Excepting for surveying by photography, or other scientific purposes, it may, then, be taken that the height of the camera does not appreciably alter the position of a sea horizon.

The same applies to any "distant" horizon; the only difficulty is to know what is a "distant" horizon. Very roughly it may be said that, in the case of an object at any distance, an alteration in height of the camera has no appreciable effect on the position of the horizon, unless such alteration be as great as $\frac{1}{100}$ part of the distance. Unless it be greater, the alteration in the position of the horizon will not be greater than $\frac{1}{10}$ of an inch. Of course this figure is an arbitrary one, but I think that most will admit that a difference in the position of the horizon of $\frac{1}{10}$ of an inch will make no appreciable difference in a picture of, say, cabinet to whole-plate size. Granted this, we may conclude that for all objects—horizons at a distance of 150 feet or so—there is no appreciable difference in the position of the horizon brought about by altering the point of view from that of a sitting to that of a standing figure, the difference between

* I have seen the height of Mount Everest stated at so many feet and inches! The absurdity of this is evident to any one who knows that the one thing that the most elaborate modern surveying cannot determine accurately is the height of a high mountain. Barometrical observations are, of course, only approximate, and all trigonometrical methods are subject to an unknown error on account of varying refraction by the air of different heights. I have no hesitation in stating that the height of no mountain more than 10,000 feet high is known within 1 per cent.

the two points of view being about 1 foot 6 inches, which, multiplied by 100, is 150 feet or 50 yards.

In the cases where really near objects form part of the photograph, an alteration in the height of the camera may make a material difference in both the position and the form of the horizon—objects that, with a high position, are seen against other parts of the landscape being seen against the sky. This is often a matter of great importance. In the case of figures, for example, if the height of the camera be that of the eyes of such standing figures, a true horizon line will intersect the heads of the figures, with an effect generally objectionable. If, on the other hand, the camera be lowered, the heads will stand well above the horizon, and the effect is generally improved.

The result of lowering the camera is always to raise the foreground relatively to the distance, and the result is often a great improvement. In any case photographers should pay much more attention to the height of the camera than they commonly do. One will see a photographer taking all the pains in the world to select a good position, so far as a horizontal plane is concerned, then plant his camera in the selected position without making any attempt to find whether he has selected the best height. He ought to bear in mind that a few inches' difference in height may make as much difference in the composition of his picture as so many yards in a horizontal position. The writer by no means confines himself, as the lowest point of view, to the position of the eyes when sitting on a camp-stool, but frequently places the camera on the box that holds it, which, according to the way it is placed on the ground, gives a height of from about 10 to 16 inches, and occasionally places it directly on the ground, in which case it must be admitted that focussing is not an amusing operation.

While on this subject, it may be well to say a word or two on photographic backgrounds for portraiture. As I have said, in the case of a figure, the effect is generally better if the horizon is somewhat below the level of the head, but the position given to the horizon on many backgrounds made for professional photographers, of from one to two feet above the floor, is absurd. One may enjoy a landscape whilst reclining at full length on the ground, but this is not the position in which a figure subject is commonly studied.

W. K. Burton.

ON THE AVOIDANCE OF REFLECTIONS IN COPYING.

At some time or other it generally falls to the lot of most photographers to have to undertake the copying of numerous articles, such as framed pictures, paintings, photographs, or other subjects, the glazed surface of which offers a considerable amount of trouble in the way of reflection, for since the introduction of double albumenised and printing papers of the aristotype class, it is very seldom, indeed, that even such a commonplace article as a photograph comes to hand for the purpose of copying that does not give trouble in this respect. In the following remarks I propose to deal with such instances as are met with in ordinary daily practice.

In the case of unmounted photographs or pictures in scrap form, undoubtedly the first consideration is, What is the best method to employ with the view of keeping the surface perfectly flat during the operation of photographing them, and also the necessity of so undertaking the work that no risk of injury to the picture ensue?

As a rule, it will be found that prints in scrap form generally reach the photographer's hands in the form of a roll. Sometimes, when such are the production of professionals, the glazed surface will be outwards, but more frequently, when such emanate from amateurs, the prints will be rolled glazed side inwards, the reason for rolling the prints in a damp state face outwards being that a higher gloss is maintained than when rolled inwards. In any case, however, the gloss will be sufficient to give trouble, no matter what method be employed for holding the prints *in situ* during the operation of copying.

A very prevalent custom when prints are tolerably flat is to merely attach them on to a common board by means of drawing pins or tacks. Rolled prints, however, will seldom be found to lie absolutely flat when treated in this manner, no matter how many studs be employed.

Others, again, with more elaborate apparatus in the shape of a copying board, are furnished with binding laths, which are capable of being placed at varying distances apart, and which, by projecting along the edges of the print, keep the same at the outside at least free from bulging forward, although the centre of the picture, as a rule, is not so flat when treated in this manner.

Others, and, as a rule, with less experience, deem it essentially necessary that the print be mounted in some shape or form, and proceed forthwith to attach it to some stout cardboard, a method entailing much trouble and loss of time, not to speak of the risk of damaging a good picture.

A much preferable, in fact perhaps the best of all methods to follow when dealing with unmounted pictures of every class is to sandwich them between two sheets of clean glass, using a few common clothes pegs to keep the two glasses closely in contact with the print between them. Pictures so placed run no risk of injury, not even from the punctures of drawing pins or tacks, and are also most easily placed *in situ* by this means for copying.

Small sizes may be conveniently placed in an ordinary printing frame carrying a sheet of glass. When the back of this is tightly sprung up, even pictures mounted on cards will be found perfectly flat.

When dealing with somewhat larger sizes than the largest printing frame will accommodate, I have frequently used an ordinary oak picture frame, and made it do duty most efficiently in a similar manner to the printing frame.

Some workers object to the employment of glass on the face of any picture being copied, on account of the great liability to suffer from the trouble the reflections from the glass surface causes when being photographed. Such, however, need never give trouble, for, by working on well-defined lines, they are easily disposed of.

One very important factor when undertaking this class of work, and dealing with subjects that are apt to cause reflections, is the employment of a suitable lens for the occasion. As a rule, I think it will be found that, for copying purposes, lenses of short focus are recommended, evidently on account of the wide field they cover at a short distance; practice, however, has clearly shown me that a short-focus lens is not nearly so suitable for copying purposes as a long one under many conditions of situation and lighting, at least so far as its employment is concerned with the view of avoiding reflections. This can be easily proved by any one trying the following test conditions.

In any ordinary room lighted with, say, one window, let a worker place, at a convenient distance from same, a picture having a glazed surface, or an engraving enclosed in a frame carrying a usual front glass; in either case it will not be difficult to so place the picture as to ensure a good crop of reflections being at once apparent from the surface of the glass. In fact, the difficulty will be to so place the picture as not to produce such, for, the moment the glazed surface is presented at a certain angle to the source of light for the purpose of being copied, these bothersome visitors put in an appearance.

When the camera having a lens of short focus, say about six inches, is brought into position and the image focussed on the ground-glass screen, a well-defined view of these reflections will be at once observed on the focussing screen of the camera, and, were any sensitive plate exposed under such conditions, of course a worthless result would ensue. Now, however, without moving the object being photographed or altering its angular position in relation to the source of light from the window, let the worker remove from the camera the six-inch lens and substitute for the same one of much longer focus, say eighteen inches, and proceed with its aid to produce an image of exactly the same size as the six-inch lens yielded. To accomplish this, of course the camera must be withdrawn the necessary distance, but by so doing, and on examination of the image through the eighteen-inch lens on the focussing screen, it will be seen the annoying reflections no longer exist, they having entirely disappeared, although the image desired and aimed at by the six-inch lens is exactly the same in the case of the eighteen-inch one. So much for the advantage of using long-focus lenses in cases where it is undesirable to move the objects; and this non-removal of the object in itself is really another very important factor in the question under consideration, for the employment of long-focus lenses will permit of many subjects being placed in a much better position as regards the lighting of the object than a short-focus lens will; with the latter it will be found that in nearly every instance a distinctly side light must be employed with its many drawbacks, such as liability to show the grain of the paper, and almost absolute certainty of an unequal lighting of the object. With long-focus lenses, however, the picture being photographed may be placed in a considerably better position as regards the source of light from the window; in some instances, where the shape and dimensions of the room will permit, there will be but little difficulty in obtaining an almost perfectly even illumination all over the surface of the picture, and the texture of the paper will be entirely absent in the resulting negative, the predominance of front light, coupled with the employment of the front glass, tending to entirely overcome this objectionable feature.

So much for the employment of long-focus lenses in preference to short ones, with the view of obviating reflections of the above class.

There are, however, reflections of another kind that frequently give no little amount of trouble, and which often bother a worker to find out the cause of. I remember on one occasion being asked to account for the presence of a peculiar flare spot in a negative shown to me by a very careful and competent worker, who knew his way about pretty well, and who was entirely baffled in his attempt to account for the mark in question. Every precaution, so far as he could think of, was taken to avoid reflections in the negative in question, and so certain and satisfied was he that there were no reflections or flaws when exposing the plate that he called a friend, and with pride pointed out the image on the ground glass as being entirely free from all these annoying visitors. So, after tea, we went and inquired into the matter. Everything was minutely described, exactly as it took place. I soon saw that careful conditions of lighting had been arranged, and other matters of importance attended to; but Jack had a vulgar habit of working in his shirt sleeves at times, and on my suggesting that it was Monday, and his linen had not yet deteriorated in purity, the week not being far advanced, he laughed heartily, and said, "By Jove! so it is." He had focussed under the cloth in such a manner that his white shirt did not appear visible; but, of course, when standing by and removing the cap of the lens, the white shirt was reflected back on to the sensitive plate through the lens, he being in a position opposite the picture.

T. N. Armstrong.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The annual meeting for 1894 of the Photographic Convention of the United Kingdom will be held in Dublin in July next, and, judging from the interest excited there, and the efforts that are being made on its its behalf, it promises to be one of the most successful ever held.

It may be remembered that the Photographic Society of Ireland—which, by the way, is the second oldest in the world—invited the Convention for 1893, but prior claims had to be met, and the invitation could not be accepted until this year. The President for the year will be Sir Howard Grubb, whose name alone gives a guarantee of success, and we are informed that, by the exertions of the Photographic Society of Ireland, an exceedingly strong and influential Committee of Reception has been formed, containing amongst many others such names as the Earl of Rosse, Viscount Powerscourt, the Lord Mayor, the Astronomer Royal, and the heads of nearly all the scientific and learned bodies. The proceedings will open on Monday, July 9, with a full-dress reception and *conversazione*, when it is expected that the splendid premises of the Royal Dublin Society and the Museum of Science and Art will be thronged with an assemblage of brilliancy and beauty such as Dublin delights to call together to welcome her visitors.

On Tuesday there will be an excursion to the Hill of Howth, and to Poul-a-phouca, and in the evening papers, &c. On Wednesday there will be the usual business meetings, the Convention groups photographed, and the Convention Dinner in the evening. On Thursday there will be a long and interesting excursion to the Valley of the Boyne, the Tumuli of Dowth, and New Grange, the monastic remains of Monasterboice and Mellifont, with their round towers, Celtic crosses, shrines, and chapels, samples of the best of the famed early ecclesiastical art of Ireland. On Friday there will be excursions to the County Wicklow, Enniskerry, the lovely Dargle Valley, Powerscourt Demesne and Waterfalls, and on the other side to Trim Bective Abbey, and all their interesting surroundings. In the evening there will be a full-dress reception by the Right Hon. the Lord Mayor at the Mansion House. On Saturday visitors will be taken round the rocky scenery of Bray Head, past the lovely Bay of Killiney, and on to the Vale of Glendalough, with its lakes and Round Tower and seven churches. On this occasion visitors may remain over Sunday, and further explore the County Wicklow, Vale of Ovoca, &c., on the following week.

The usual Exhibition of photographs and apparatus will be held in the Photographic Society's rooms, 35, Dawson-street (opposite the Mansion House), and here, also, will all the business meetings be held. The principal hotels offer a reduction to all members of the Convention. The railway companies have met the Committee in the most generous manner, and, being anxious that members of the Convention should see as much of the country as possible, have arranged to allow them to travel from Dublin to any stations on their line at single fares for the return journey, from the 9th to the 31st July, and it is hoped that this will induce many of the members to arrange to take their holidays in Ireland this year. In addition, there are cheap trips offered to Killarney, and the Great Northern Railway offer special rates to members who wish to visit Lough Erne or Rostrevor. The rates to the first-named will be 11*s.* first class, 8*s.* 3*d.* second class, and 5*s.* 6*d.* third class, return; and to Warrenpoint, 8*s.*, 6*s.*, and 4*s.* It need hardly be said that Dublin itself contains much that will be interesting to members, both as photographers and as tourists, and we may venture to affirm that the welcome that they will receive will show them something of that old Irish hospitality which is fortunately not yet extinct, and we trust the opportunity will be taken to make the gathering larger than any yet recorded in the annals of the Convention. It only remains to be said that all the privileges of membership may be obtained by forwarding an application, and fee of 5*s.*, to the Hon. Secretary, F. P. Cembrano, jun., 10, Cambridge-gardens, Richmond, Surrey; or to the Hon. Local Secretary, John A. C. Ruthven, 35, Dawson-street, Dublin.

Our Editorial Table.

"L'Email" Citrate of Silver Paper.

From Messrs. Wratten & Wainwright, of 38, Great Queen-street, Long Acre, W.C. (who, with Mr. Fallowfield, have been appointed sole agents in England for this paper) we have received samples of a new citrate of silver emulsion paper, "l'Email," for trial. The paper is made by a well-known Paris house, Messrs. Carsault & Co., who for many years past have deservedly enjoyed a very high reputation for the uniformly excellent qualities of the printing papers prepared by them. The principal features of the new paper are its extreme rapidity in printing, the facility with which the purity of the whites is preserved, and its readiness to take agreeable and artistic tones in any of the separate or combined baths in ordinary use. As it is also claimed to give rich black tones, our own trials were made with the phosphate toning bath, the advantages of which are that it is ready for use immediately after preparation. We append the formula:—

Gold chloride	1 grain.
Phosphate of soda	20 grains.
Water	8 ounces.

In this bath, after the usual preliminary washing, we found the prints take a very beautiful purple black tone, such as is ever in favour with the public, and which, whatever the fluctuations of artistic taste may be, is always pleasant to contemplate. "L'Email" will be found to be a thoroughly good and, above all, easy, simple printing paper to manipulate.

Messrs. Wratten inform us that it is to be retailed at popular prices. The following instructions are issued with the paper:—The paper is for use with any toning bath, combined or separate, and giving any shade required; but, for combined toning and fixing, either of the following formulæ will give excellent results. It is not necessary to wash the prints before toning:—

A.

Hypo soda	5 ounces.
Citric acid	15 grains.
Alum	1 ounce.
Acetate of lead	8 grains.
Water	18 ounces.

B.

Chloride of gold	15 grains.
Water	4 ounces.

C.

Hypo soda	4½ ounces.
Sulphocyanide of ammonium	3 drachms.
Alum	¾ ounce.
Acetate of lead	15 grains.
Water	18 ounces.

Solutions A and C should be filtered.

For use, take as follows:—

A or C	3½ ounces.
B	2 drachms.

A spoilt print or some trimmings of paper should be put into each fresh bath before toning is commenced. After use, keep the solution in a well-corked bottle in the dark. Before employing again, decant the clear liquid carefully and add an equal quantity of fresh bath.

If an excessively brilliant surface is required, dry on a piece of ebonite or ferrotype plate. A sheet of glass, well rubbed over with powdered talc, or the following solution will answer the same purpose.

Spermaceti	30 grains.
Benzole	5 ounces.

For mounting, take some stout paper, slightly larger than the print, coat with starch or thin glue, and press on to back of print.

When dry, trim round with a sharp knife, and it will become detached from the glass. When the print upon the glass or other support is half dry, coat same with a solution of gelatine (filtered), and allow to finish drying, then remove and mount upon a card, with dampened surface.

For hot rolling, treat in same manner as albumenised paper.

News and Notes.

MR. JOHN SPENCER has removed from 125, West Regent-street to 121, West George-street, Glasgow.

THE Photochrom Zurich Co. have removed from 7, St. Paul's Churchyard to larger premises at 61 and 63, Ludgate-hill, E.C.

VISITORS to Rothsay will be glad to know that they can now obtain plates and photographic chemicals of all kinds from Mr. Adamson, photographer, there.

HACKNEY PHOTOGRAPHIC SOCIETY.—The Annual Exhibition of this Society will be held on the 20th, 21st, and 22nd of November next. Particulars of classes, &c., will be announced early in July.

"TIT-BIT GUIDE TO PHOTOGRAPHY."—Under this name, Mr. William Tylar, of Birmingham, has issued a penny *brochure*, containing, not alone advertisements of his own numerous specialities, but many hints and bits of information calculated to be serviceable to the beginner in photography, for whose use it is mainly intended.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—Meeting of the Benevolent was held at the registered office of the Association on Friday last, the 25th ult., Mr. A. Mackie in the chair.—There were three applications for assistance. First was from an assistant who had come to London to obtain work, and had been unsuccessful. He was absolutely penniless, and, having obtained a situation in the country, wanted a grant to pay his railway fare down, and redeem several articles from pawn. Granted. Second application was from a London photographer, who had been out of work for some time, and had been obliged to pawn everything, and was now penniless. A small grant was made to meet present necessities, and the case was referred to the Secretary. Third application was from a photographer who had been turned out of his business premises without warning through no fault of his own, and so had lost his connexion; and this, coupled with the expenses of removal to new premises and serious illness, had crippled him for want of funds. A small grant was made to meet present necessities.

"THE term 'screen,'" says *Process Work*, "which is now generally applied to the ruled plate for half-tone work, is somewhat confusing when the ground glass is also thus described; and one is inclined to wish that some more distinct term could be adopted. In the old days the screen was generally known as the 'tint,' which was expressive and well understood. Likewise the half-tone process was known as the 'nature' process, another equally apt term. We are afraid it is too late to revive these designations. In deciding on the purchase of a screen, the number of lines to the inch is an important consideration, and the mistake which most beginners make is in selecting too fine a ruling. Screens of 85 and 100 lines to the inch are almost always ignored, yet it is surprising what vigorous results these will give if used rightly. A coarse screen gives more contrast than a fine one, and the only disadvantage of the former is when fine detail has to be rendered. For large portrait heads a coarse screen is best, and naturally the resulting blocks print well in rough newspaper work. For a good all-round screen we recommend 125 lines, but, if one already has a 133-line screen, then we advise 120 as the medium. For high-class magazine or book work, 150 lines is fine enough for anything. The only other rulings which need be considered are 175 and 200 lines to the inch. For the reproduction of micro-photographs the former is invaluable, and as regards the latter, its use is very much in the nature of an experiment. We question whether the blocks from such a screen could be printed in this country, but we have had beautiful proofs from America."

TUNBRIDGE WELLS AMATEUR PHOTOGRAPHIC SOCIETY'S EXHIBITION.—A local paper says: "The Tunbridge Wells Amateur Photographic Association held its seventh exhibition of photographs, apparatus, process, and photo-chromotype work, &c., at the Town Hall, on Wednesday, May 23. The executive are to be heartily congratulated, not only on the success which attended their efforts, but also upon being the means of bringing together such a really excellent display of local talent, which was greatly admired by the large number who visited the Exhibition, which was confined entirely to members' work, and in all of the classes there was a very keen competition. In the Architecture Class, the President (Mr. F. G. Smart), who takes the silver medal, has two very beautiful pieces of work—*The South Porch*, and an interior of Canterbury Cathedral—which are of his usual high artistic excellence. Mr. E. R. Ashton exhibits some very fine Venetian work, in which *The Entrance to the Doge's Palace* is especially noticeable, and would have secured a medal, but was debarred by having already taken a couple. Two interiors of a drawing-room were shown by the popular Hon. Secretary (Mr. Joseph Chamberlain), both of which were careful studies, and certainly deserved recognition; whilst Mr. J. W. Morgan had a very finished exhibit of old houses at Chiddingstone. There were a large number of admirable exhibits in the Landscape Class, and Mr. Smart, who takes the silver medal for a snow scene, in addition to two exceedingly good pieces of landscape work, *The Common, Tunbridge Wells*, and *A Thunderstorm approaching near Duddingstone Lock*, also shows some remarkably fine river and sea pieces. Mr. Gunner (of Tunbridge), a young but enthusiastic member of the Association, exhibits some excellent specimens of rver sc enery and also two bromide enlargements. Two very fine sea piece by Mr. Lewis are also noticeable, while Mr. E. R. Ashton has several carefus studies of Lake Como and a Venetian sunset. Mr. Booty shows four very pretty pictures, while an admirable series of twelve photographs is exhibited by Mr. Chamberlain, of which we should specially mention *The Cloud-capped Towers*, representing Dover Castle with a storm cloud approaching, and *Queen Elizabeth's Pocket Pistol*, the somewhat satirical name given to a huge cannon at Dover Castle. Mr. Chamberlain also shows several capital flower studies and Mr. Cassingham has a large display of landscape photographs, including several of the landslip at Sandgate. Mr. J. W. Morgan, who is awarded the bronze medal in this class for a cloud scene at Windermere, also exhibits several photographs of the camp at Crowborough; while the Rev. A. T. Scott exhibits a frame of four landscape subjects in *genre* and portraiture. Mr Ashton, who gains the silver medal for a Venetian courtyard, also displays several very fine Venetian studies; while Mr. Chamberlain exhibits groups of Italian peasants, which every one appeared to believe were real natives, but we could not help recognising well-known local faces. Mr. Pierson has two excellent studies, whilst Mr. Smart has a remarkably good piece of work, entitled *On the Look-out at Braemar Castle*. In the Lantern-slide Classes, the Venetian work of Mr. Ashton, the Folkestone studies of Mr. Pierson, and the very fine frost and other effects by Mr. Cornell should especially be mentioned. The awards were adjudicated as follows by Mr. H. P. Robinson, as Sir David Salomons was unable to be present:—Architecture: Silver medal, F. G. Smart, Esq., *South Porch, Canterbury Cathedral*. Landscape: Silver medal, F. G. Smart, Esq., *Snow Scene;* bronze medals, Mr. Gunner (Tunbridge), *Springtime;* Mr. J. W. Morgan, *Lake Windermere*. *Genre:* Silver medal, Mr. E. R. Ashton, *Venetian Courtyard*. Lantern Slides: Mr. A. W. Pierson, Sir David Salomons' medal; Mr. E. R. Ashton, silver medal; Mr. A. Cornell, bronze medal."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
4	Peterborough	
4	Putney	
4	South London	*Art Photography and O. G. Rejlander.* Charles H. Oakden.
4	Stereoscopic Club	
5	Birmingham Photo. Society	
5	Brixton and Clapham	*Notes on Pictorial Work with Hand and Stand Cameras.* W. Thomas.
5	Exeter	
5	Hackney	*Experiences.* Thomas Fall.
5	Herefordshire	
5	Lewes	
5	North London	
5	Oxford Photo. Society	
5	Paisley	
5	Rochester	
5	Rotherham	
5	Sheffield Photo. Society	*Art in Relation to Photography.* Mr. Crowder.
5	West London	
5	York	
6	Croydon Camera Club	Ninth Excursion leaves South Croydon at 8.14 for Cambridge.
6	Edinburgh Photo. Society	
6	Leytonstone	
6	Photographic Club	*Photogravure.* H. Willmer.
6	Southport	
6	Southsea	
7	Birmingham Photo. Society	
7	Glossop Dale	
7	Hull	
7	Leeds Photo. Society	*Carbon Printing.* Herbert Denison.
7	London and Provincial	
7	Oldham	
7	Tunbridge Wells	
7	Woodford	*Plate Backing.* H. T. Malby.
8	Cardiff	
8	Central Photographic Club	
8	Croydon Microscopical	
8	Halifax Camera Club	
8	Holborn	
8	Maidstone	
9	Croydon Microscopical	Excursion: Penshurst and Chiddingstone. Leader, J. Weir Brown.
9	Hull	
9	Liverpool Amateur	Excursion: Rostherne and the Bollin Valley Leader, J. Davenport.
9	Oldham	Excursion: Speke for Speke Hall. Leader, John Holden.
9	South London	Excursion: Rickmansworth.
9	West London	Excursion: Chiswick.

PHOTOGRAPHIC CLUB.

MAY 23,—Mr. R. Child Bayley in the chair.

Mr. THOMAS BEDDING passed round specimens of Messrs. Dixon & Gray's work on orthochromatic plates, remarking that their results shown at the Exhibition of the Photographic Society of Great Britain in 1886 undoubtedly gave an impetus to orthochromatic work. Mr. Bedding also showed negatives on orthochromatic plates developed, without fog, in a yellow light, the latter being turned away from the plates.

Mr. J. B. B. Wellington showed specimen prints on the new "Barnet" platino-effect bromide paper, which were developed with metol.

PHOTOGRAPHY WITH THE AID OF COLOURED SCREENS.

Mr. ARTHUR BURCHETT gave an address on this subject, illustrated by

numerous specimens, &c. He said the combination of screens he used consisted of green and yellow glasses, fitted inside the barrel of the lens, the green being behind the front combination, and the yellow in front of the back. He showed a spectrum with negatives of same, with and without the screens. Another way of using the screens was to cement the two glasses together, and place them behind the front combination. The specimen prints shown were of landscapes, taken against the sun, the speaker pointing out the entire absence of halation. The screens increased exposure from six to eight times. Some of the negatives were on isochromatic plates, but it was not necessary to use the latter. Plates such as Paget's fifty-times were suitable. He then showed what he termed the "dyed balsam screen." The method used was as follows:—Two pieces of optically ground glass were cemented together with balsam dyed with aniline dye, certain proportions of red, green, and yellow being used. He remarked that, with the balsam screen, there was not the difference of a "stop." A specimen print shown was from a negative on Edwards's isochromatic instantaneous plate, with *f*-32, and a shutter exposure (Thornton-Pickard shutter set at fastest). For portraiture, the screen was advantageous, as he showed by comparative results, the whites being entirely free from "fogging." For copying black and white drawings the results were perfect.

In the discussion which followed, Mr. H. E. DAVIS said that he had been experimenting with Mr. Burchett's screens. The first he made were not successful for hand-camera work, which was the point he was aiming at. Mr. Burchett had been kind enough to have a screen prepared for him which he could use for hand-camera work. The results he showed were taken in the one thirty-second of a second. He also showed results under all conditions of weather, clouds and their reflection in water. He emphasised Mr. Burchett's remark, that with the screen the results were free from halation. In one specimen the twigs on trees showed well in front of the sun.

Mr. J. A. SINCLAIR said that he had used Mr. Burchett's screens with success. He would like to ask if it was necessary to have the green screen in front?

Mr. BURCHETT answered no.

Mr. SINCLAIR asked if Mr. Burchett had found all makes of ordinary plates usable with these screens.

Mr. BURCHETT said no.

Mr. Sinclair showed a series of three prints from negatives taken by the Ilford Company, one without a screen, another with an Ilford screen, and the third with a Burchett screen. The latter required double the exposure of the Ilford screen.

Mr. T. R. Dallmeyer showed some untitled prints taken with and without screens, which he would like members to examine, and say which was taken with an ordinary yellow screen and which with a Burchett screen.

Mr. R. P. DRAGE asked if any one had tried the method suggested by Mr. W. K. Burton, which was to have a screen right in front of the plate, which was, he claimed, the only perfect method.

Mr. J. B. B. WELLINGTON said he had used an ordinary yellow screen, and, with the exception of the rendering of the clouds, he thought he could obtain equally good results without.

Mr. FRANK TURNER said that he had just commenced a series of experiments with Mr. Burchett's screens for copying bank-notes, foreign bank-notes being printed in colours. He promised to bring results on a future occasion.

Replying to Mr. Wellington's remarks, Mr. BURCHETT said that the green and yellow glasses were not a "universal medicine." For some things it was better not to use the green and yellow glasses.

The CHAIRMAN pointed out that, with an ordinary plate, the distance was rendered as though taken on a misty day.

Mr. MACKIE, referring to two of the untitled prints, remarked that, on one, three trees shown on the horizon must have been in the negative perfectly clear glass, which was not true to Nature.

A vote of thanks to Mr. Burchett concluded the proceedings.

Hackney Photographic Society.—May 22, Mr. E. Puttock in the chair.—Mr. ROOFE announced particulars of the forthcoming excursion to Enfield on Saturday, June 2. Members to meet at Enfield Town on arrival at 2.59 p.m. of train which leaves Liverpool-street at 2.21. Route to be by way of Chase Side, Clay Hill, and Whitewebbs Park. Mr. Dean gave first notice of excursion to Loughton. It is to take place on June 6, instead of May 30, as previously announced. Train to leave Liverpool-street at 2 p.m., Fenchurch-street at 2.13 p.m. Reports of excursions to Burnham Beeches on Whit Monday, and Eynsford on the 19th inst. were read by Messrs. T. H. Smith and W. L. Barker respectively. Members' work: Mr. Beckett showed some cloud negatives, Mr. Wilks some lantern slides on collodion plates, Mr. Dean some gelatino-chloride prints, Mr. Grant some enlargements on Eastman's platino-bromide paper, one having been toned with hypo and alum. To get a warm tone, the print had been in toning solution for eight hours. Mr. HENSLER said that if the heat of the toning bath had been kept up, toning would be complete in twenty minutes. Mr. Hudson showed some excellent hand-camera negatives which had been developed by the following formula:—A, Eikonogen, ½ ounce; hydroquinone, ½ ounce; soda sulphite, 2 ounces; dissolve in order given in 40 ounces of boiling water. B, Caustic soda, 1 ounce; water, 10 ounces. For use take of A 2 ounces; B, ½ drachm. Mr. White, of Croydon, showed his new hand camera, and Messrs. Newman & Guardia sent a representative with one of theirs. Mr. W. FENTON-JONES then read a paper on *The Humorous Side of Photography*, and demonstrated that there is plenty of humour even in the amateur photographer's troubles and blunders, especially when viewed by somebody other than the victim himself. Several members followed with amusing experiences, and a vote of thanks terminated the meeting.

North Middlesex Photographic Society.—The fifth instruction evening of the year was held at Jubilee Hall, May 21, Mr. A. J. Golding in the chair. Mr. S. E. WALL gave a paper on *Cloud Negatives and their Adaptation to Lantern Slides and Enlargements*. He also showed, by means of diagrams on the screen, his adaptation of the black mirror for obtaining cloud negatives. After referring to the great advance in taste since wet-plate days in the matter of skies, he laid great stress on the choosing of suitable skies for landscapes, with special reference to the perspective of clouds. Mr. Wall was of the opinion that skies should be suited to the foreground, and that he quite agreed with printing in clouds. But for the purpose of gaining clouds and landscape on the same plate (when in harmony), he advocated the use of Tylar's window shutter, and also by partial development, and thoroughly washing the plate when the clouds are fully out, bringing out the foreground by means of the brush or partial immersion in the developer. In explaining the use of the black mirror, he said he found a true black reflecting surface free of double reflection by the use of a piece of thin patent plate, one surface being ground, and then coated with black varnish. This he found quite perfect in its results, and gave him cloud details round the sun which he could not see with the naked eye. Mr. Wall's method of adapting skies to lantern slides and enlargements is by adjusting in front of the camera a sheet of clear glass masked to the size of the negative. The negative is fixed in position in front of the glass, and after exposure the landscape portion is blocked out roughly on this piece of glass with a brush and some opaque colour; the sky negative is then adjusted and the exposure finished. Mr. Wall passed through the lantern some forty slides illustrating various points in his paper, with special references to the blocking out of the foregrounds. A lengthened discussion then took place by Messrs. Cox, Taylor, Mattocks, McIntosh, Child Bayley, and Avery, but was chiefly centered round the use of the black mirror of clouds.

Leicester and Leicestershire Photographic Society.—May 24, the President (Mr. J. Porritt) in the chair.—There was an excellent attendance of members, the most gratifying feature in which was the presence of a great number of the younger members of the Society, for whose benefit the genial President particularly devotes his attentions. The usual business was transacted, four members balloted for and one proposed. The places selected by the Committee for the ensuing out-door meetings were accepted, and the PRESIDENT gave a most acceptable paper, entitled *Flower Studies*, and also a few remarks on the use of the hand camera. The President also offered silver and bronze medals for the best six pictures taken on the excursions.

Photographic Society of Ireland.—The last Annual Meeting of the above Society was held in the Large Lecture Hall, 35, Dawson-street. The HON. SECRETARY (Mr. J. A. C. Ruthven) read the report of the Council, which was adopted, and which proved to be the most favourable report submitted in the annals of the Society, over fifty new members having joined during the year. The election of Council and officers was proceeded with, and the following was declared as the result:—*President:* Professor J. A. Scott, M.D.—*Vice-Presidents:* Messrs. Alfred Werner and L. R. Strangways, M.A.—*Council:* Messrs. A. M. Geddis, R. M. Inglis, J. H. Woodworth, T. J. Richardson, and James Carson, C.E.—*Hon. Treasurer:* Mr. William Bewley, B.A.—*Hon. Secretary:* Mr. John A. J. Ruthven, A.M.I.C.E. The following gentlemen retain their seats for another year:—Dr. E. MacD. Cosgrave, Messrs. F. H. Orr, J. H. Hargrave, B.A., and W. E. Smyth. It will be remembered that, although this meeting ends the work of the Society for the summer, its members will be kept fully occupied in the extensive preparations being made for the reception of the Photographic Convention, which, at their invitation, visits Dublin in July next.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9826.—"Improvements in Camera Stands to be used for Illuminating and Photographing Transparent and Opaque Objects from a Vertical Aspect." T. C. HEPWORTH and T. R. DALLMEYER.—*Dated May*, 1894.

No. 9890.—"Improvements in Photographic Apparatus." S. D. MCKELLEN.—*Dated May*, 1894.

No. 10,127.—"A Bichromate Oxyhydrogen Compound." T. HAWKINS, S. H. HAWKINS, and G. NEWNHAM.—*Dated May*, 1894.

No. 10,200.—"Improvement in Screens or Shields for use with Photographic Lenses." M. STODART.—*Dated May*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN OPTICAL LANTERNS.

No. 10,238. LAMBERT MATTHEWS, Strafford House, Hadley Green, Barnet.—*April* 21, 1894.

MY invention relates to improvements in the construction of optical lanterns, used for the projection upon a screen of photographic and other pictures, and the invention has for its object to enable the apparatus to be so lightly constructed and to be packed in such a small compass as to be easily portable, and

yet, when erected for use, to possess the strength and stability of the heavy and cumbrous apparatus now employed.

The framework of the apparatus on which the objective, the condenser, the slide-carrier stage, and the burner are carried consists of two base blocks or feet held at the proper distance apart by longitudional tubular rods fitted to slide through the base blocks so as to be readily detachable therefrom, and upon which the rear base block carrying the condenser and slide-carrier stage is adjustable in the fore and aft direction to suit the focal length of the objective. Upon each base block is erected a pair of tubular pillars acting as distance pieces for tie rods passing up loosely through the base blocks and pillars, and provided with heads at the lower, and tightening nuts at the upper, ends, the pillars being braced at top by cross and longitudinal bars secured by the same nuts, the longitudinal bars being slotted to permit of the fore and aft adjustment above referred to. The front on which the objective lens carrier is mounted has grooved edges fitting between the front pair of pillars and the condenser, is clamped in a hoop, which, as well as the slide-carrier stage, is supported by sockets fitting tightly on the rear pair of pillars and capable of sliding thereon to permit the independent vertical adjustment of the condenser and slide-carrier stage. All the parts of this framework are readily separable for transport, and are readily put together for erection, it being only necessary to throw a cloth over the frame to prevent dispersion of the light when the lantern is in use.

The burner is supported on a carrier provided with sockets fitting on the rear ends of the main tubular longitudinal rods which project behind the rear base block, and upon which the burner carrier is adjustable in the fore and aft direction, the burner being fitted to slide laterally upon a part of the carrier, which is itself supported by adjusting screws, provision being thus made for the fore and aft lateral and vertical adjustment of the burner. The burner is enclosed in a lantern body, whose four sides are hinged together, so that they may be collapsed diamond-wise, and are rigidly held in the expanded square form when erected for use, by the top of the body engaging with two opposite sides, either by means of guide grooves, if the top be fitted to slide, or by the top being hinged to one side, and engaging with the opposite side, or with one of the adjacent sides, the front side of the body being provided with a flanged aperture fitting on the condenser mount, whereby the lantern body is supported.

The slide-carrier frame is fixed upon its stage by means of a dovetailed plate on the one fitting between corresponding gibs on the other, whereby a firm and secure connexion is effected without the use of springs, whereby fixity of the luminous disc on the screen is ensured, and coincidence of the discs when two lanterns are used is readily obtained.

Improvements in Photographic Cameras.

No. 11,841. Griffith David Hughes, Oak Bank, Cheadle Hulme, Cheshire. *April* 21, 1894.

My invention relates to photographic cameras; more particularly to apparatus whereby a number of sensitised plates or films may be changed in a simple and effectual way without the admission of light for the purpose of consecutively receiving photographic images.

It consists of the following parts: The outer camera case; a second case, which slides easily and evenly within the first case mentioned, and which contains the hereinafter mentioned sheaths so fixed in it as shall be described; a number of sheaths of a certain pattern, and fixed in a certain way; a spring, or other motive power, which shall cause the inner case to slide easily within the outer case; a cogged wheel, with a rod fixed through its centre, which shall be so fixed in the top of the outer case as to revolve and act as a detent, only releasing the plates one by one as desired.

The outer case will be a box with a door, hinged, or otherwise fixed, at the back, and the necessary aperture at the front.

The inner case will be a box fitting closely into the other; but this case will be without a top; also one of the sides will be partially cut away, and the front side will have a suitable aperture through which the light bearing the image can pass.

This box will hold the sheaths, which will contain the sensitised plates or films.

The sheaths will be of a particular pattern, and fixed in the way now described.

The sheaths, to be made of tin or other material, either by stamping or other process, will hold the plate or film in the usual way by grooves or otherwise, but the bottom of the sheath will be continued to some distance beyond the portion of the sheath occupied by the plate or film. This margin has the following purpose: so that out of it may be made, or to it may be attached, two ears, which may be bent back or fixed at right angles to the sheath. The points at which these two angles will occur in each sheath will be different, to that degree which will enable the sheaths to lie close together, whilst the pairs of ears lie consecutively within each other.

Suppose the sheaths, with their respective ears, to be lying perfectly even together, then, through the whole of the ears, holes are pierced, through which a rod is thrust, which shall hold all the sheaths thus together, and on which each sheath can separately revolve, and it will be found that the sheaths will fall consecutively, on being released, from the perpendicular to the horizontal position. The rod thus holding the sheaths together is fixed in the inner case at that point which will enable sheaths, when standing perpendicularly, to just clear the top of the outer box when sliding within it. The sheaths so placed are kept in position by the detent in front and the spring behind.

The detent will consist of a cogged wheel, fixed to a rod passing through its centre, the rod revolving on bearings at the sides of the camera. The cogs will have to be such as to easily and regularly engage with the top ends of the sheaths as they are consecutively presented to them through the pressure of the spring behind or through any other means of motion that may be used.

It may be an advantage to have two similar cogged wheels, one at each end of the rod, in preference to one only at the centre.

Such cogged wheels with the attached rod will be placed in the top of the camera through slits of a sufficient size for the wheels to work in. They will be so placed that as much of the wheels will protrude underneath as to satisfactorily engage with the sheaths as they present themselves. The rod actuating the wheels will be slightly wider (*i.e.*, the length of the rod slightly greater than width of the camera) than the camera, so that to the one end may be attached some means of revolving the wheel, as by a finger, or preferably by a key.

Acting upon the cogged wheels will be catches to prevent more than one cog passsing at a time, the idea being that a plate is released for each cog.

The spring may be of any kind, attached to the back of the camera, so long as it keeps the carrier that holds the plate well up to the cogged wheel until the last plate is released.

The following is an alternative method of propelling the inner case. On either side of the cogged wheel, and on the same rod that bears it, fix two other plain wheels of the same diameter. To each of these attach some flexible material, such as tape, and, having wound each tape once round each wheel, attach their several ends to the ends of the inner case.

It will be seen that, when the cogged wheel is made to move, the inner case will move also, and at the same speed, and that therefore the sheaths will be successively held in register against the cogged wheel.

Should any difficulty arise in the matter of propelling the inner case, owing to the weight it bears, it might be provided with small wheels running on rails or in grooves; or the inner case might rest on two lengths of rods (slightly less in length than the width of the camera) running parallel to each other in suitable apertures in a piece of wood whose thickness is less than the diameter of the rods.

In order to load the camera, you draw the inner case clean out of the camera case. You then insert sideways a plate in each sheath. It is for this purpose that a portion of one side of the inner case has to be cut, in order that the plates may be inserted into the sheaths as they are placed in their perpendicular positions.

The inner case thus loaded is then inserted in the camera until the first sheath lies in a perfectly perpendicular position against a tooth or teeth of the cogged wheel or wheels. Having done so, the door with the spring is closed.

To change a plate you turn the wheel the distance of a tooth. This action releases the first plate, which, of its own weight, falls into a horizontal position, whilst the next plate takes its place.

The number of plates that have been exposed will be indicated by numbers on the cogged wheel, or on the circular disc attached to the rod and revolving with it.

An Improvement in Photographic Apparatus.

No. 10,131. William Joseph Dibdin, Mayfield, Grange-road, Sutton, Surrey.—*January* 6, 1894.

When photographs are taken from objects brightly reflecting, there is often an undue difference of the light and shade, giving harsh, unbalanced effects, this being probably owing in many cases to the partial polarisation of many of the rays.

My invention relates to means of avoiding this evil, which I effect by polarising, so as to cut off from the picture more or less of the rays that are partially polarised by reflection. For this purpose I combine with the lens or lenses of the camera a polarising medium, such as a Nicol prism, through which all the rays have to pass on their way to form the image. In order to reduce the magnitude of such prism, I prefer to place it in or near the place where the rays are most converged. I mount it in such a way that it can be readily turned, and when I form an image on the screen I turn it as much as I find necessary to cut off or reduce the objectionable lights from the picture.

The claim is:—In combination with the lens or lenses of a photographic camera, a polarising medium such as a Nicol prism, substantially as and for the purpose set forth.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

REVERSED NEGATIVES FOR SINGLE TRANSFER.

To the Editor.

Sir,—In your last issue is an article on a subject which is of great interest to many photographers, viz., making reversed negatives for single transfer printing. Your contributor makes the suggestion that plates should be exposed from the back—that is, through the glass—and points out how this may be done. He has, however, omitted to mention the greatest drawback which is encountered in following the course he suggests, namely, halation. This, in my experience, has practically condemned what otherwise would be a very easy way of making a reversed negative. In taking portraits through the glass of the plate there must, of necessity, be a certain amount of diffusion of light, owing to the reflection from the inner surface of the glass, and in landscape work it is only by the merest chance that one can procure a good negative. This is easily explained, as the glass, with the light coloured sensitive surface at the back, forms what is almost a mirror, and fills the camera with diffused light, especially where sky is included in the picture. These are not mere ideas or theories, but are the result of an endeavour to throw over every other printing process in favour of pigment, and I am sorry that my experience leads me to say that I have found it impracticable. Stripping plates won't do, and a reversing

mirror is beyond the pocket of most of us struggling photographers; the double transfer is certainly more troublesome to work than any other commercial process. It will be a useful invention which will enable us to get reversed negatives without stripping, reversing the plates, using a prism or mirror. How is it to be done?—I am, yours, &c., G. N. F.

32, *East-street, Chichester, May* 22, 1894.

SILVER IN COMMERCIAL GELATINO-BROMIDE PLATES.

To the EDITOR.

SIR,—As there is an attempt in your last issue to discredit the valuable work done by Messrs. Haddon and Grundy in relation to this matter, I should be obliged by space for a few words on certain aspects of the question. When dry plates were reduced to popular prices, we frequently heard that the films were starved. As a practical outcome of this complaint, we had thickly coated plates at a higher price put upon the market. More recently another step was made, which may have been due to the activity of members of the London and Provincial upon the subject of halation, and plates were produced to overcome this difficulty. Recent advances of plate-makers having been in the direction of the use of more emulsion, it must be conceded that Messrs. Haddon and Grundy's investigations are of great value and interest, as bearing on these questions. Although the amount of silver in a given quantity of emulsion may not be an index to quality, yet, in relation to latitude of exposure and halation, it will be admitted that a larger amount of emulsion on a given area will bring important advantages. Messrs. Hurter & Driffield point out, in their paper on the *Determination of the Sensitiveness of Photographic Plates*, that, with the same emulsion, thickly coated plates give very much greater latitude of exposure, and that thinly coated plates cannot truly render great contrasts, and need very accurately timed exposures. I recollect a noted photographer being asked, concerning some negatives of interiors, if he backed his plates? He answered that he backed them on the front.

The average value of the silver upon a dozen plates is about 1*d*. Cannot some enterprising manufacturer give us richer films with more latitude of exposure and freedom from halation at popular prices?

Any person interested in Messrs. Haddon and Grundy's paper may obtain an unmutilated copy by joining the London and Provincial Photographic Association. The subscription is 5*s*. per annum.—I am, yours, &c., PHILIP EVERITT.

May 28, 1894.

A REJLANDER FUND.

To the EDITOR.

SIR,—In February last an appeal was made on behalf of Mrs. Rejlander, and, as it was kindly supported by you, we ask space to report what has been done in the matter.

It will be remembered that, on the death of O. G. Rejlander, the greatest leader in the direction of artistic expression by photography, his widow was left in debt. A committee then formed raised a fund which cleared the debts, and left Mrs. Rejlander in a fairly comfortable position.

During the nineteen years from then to now, she has made, or endeavoured to make, a living by selling prints from her husband's negatives, and by printing for amateurs and others. Gradually, as the interest in Rejlander's work decreased, the living became less and less, until, within the last two or three years, decreasing income and two long serious illnesses caused Mrs. Rejlander to break up her little home, part with her negatives, and even to temporarily part with her lenses, &c. In February last she was penniless and in debt, and was forced, very reluctantly, to appeal to photographers for help in restarting in business. We endeavoured to secure—

1. The use of the Rejlander negatives;
2. Orders for prints therefrom;
3. Sale for several framed enlargements made and worked up by the late O. G. Rejlander for his own home.

In the first object we have been so far successful that, by reproducing from negatives lent, by copying prints lent for the purpose, &c., Mrs. Rejlander has now some seventy fairly good negatives of whole-plate, or 10 × 8, size of some of the most popular Rejlander subjects, from which she can offer prints, either singly or in albums.

In the second object we have not been so successful. With the substantial aid of the Photographers' Benevolent Association, we have raised from various sources (including orders for prints) some 37*l*. Of this, some 33*l*. has been expended by Mrs. Rejlander in recovering her apparatus, taking a little house, making of the above-mentioned negatives and prints, and sustaining herself for nearly four months.

We hope that we shall be able to make some sale for the prints, and to find other work for Mrs. Rejlander, but in the meanwhile, and in order that she may have a fair start, we feel that it is desirable to make a public appeal for a very substantial sum. We have therefore opened a subscription list, with the sums promised by some of our own number, and shall be obliged if you will give publicity to the matter, and allow us to acknowledge, in your columns, any subscriptions that may be sent either through you (if you are willing) or through our Secretary.—I am, yours, &c., for the Committee, H. SNOWDEN WARD,

Farringdon Avenue, London, E.C. *Hon. Secretary.*

THE RIGHT OF REPRODUCTION.

To the EDITOR.

SIR,—In his very able article in your last issue, Mr. Hector Maclean touches on a business matter which concerns us all, amateurs and professionals alike. The chief points are: Shall we sell our work, or give it away? May amateurs take money for their work? Is the honour of having our work reproduced in an illustrated paper sufficient recompense for allowing it to be reproduced? These points have been often discussed, but never so well and clearly put as by Mr. Maclean. He covers the whole ground, and I can only recommend every photographer to read his article before he parts with his pictures.

It used to be a maxim with editors that nothing was worth printing that was not worth paying for, but I suppose that in these pushing days this is an old-fashioned notion. Only this morning I received a circular from that-high class and respectable paper, the *Graphic*, in which the editor descends to begging for apparently gratis help to fill his pages. The flattering appeal is to "amateurs," and the editor will only accept the best. Now, I can assure amateurs that the competition for illustrations is at present so great that, if their work is worth anything, and they demand payment, they will get it, and that, if they give it away, they will be doing a grievous injury to those who are more conscientious than themselves. It is quite an obsolete notion that there is any degradation in receiving an equivalent for good work, and, as far as opposition to the profession goes, I have always held that for an amateur to get a good price is an absolute benefit to the professional, and helps to keep up the prices, besides having the usefulness of teaching the public that *quality* must be paid for as well as quantity. It is the amateur who sells his work for the cost of the materials, or gives it away, that does the mischief, and should be "isolated" accordingly.

There is one thing that all should note, if a photographer sells his right of reproduction, it should be to appear in *one* publication only. If this stipulation is not made, electros of the blocks are sometimes sold to other and often inferior papers. If the blocks are thus treated, the photographer should obtain an additional fee with each publication. The rule should be, "Further use, further fee."

Personally, I am grateful to Mr. Maclean for his excellent article, and am with him in every word,—I am, yours, &c., H. P. ROBINSON.

Winwood, Tunbridge Wells, May 25, 1894.

SIMPLIFICATION OF THE CARBON PROCESS.

To the EDITOR.

SIR,—Your leader in last week's issue, headed "Simplification of the Carbon Process," explained very clearly in what the simplicity consists and the points of practice to which it advantageously applies.

To Mr. Walter White (an ingenious worker in photogravure, &c.) the whole merit of the original idea and its application belongs. He communicated the particulars to the Manager of the Autotype Company (some little courtesies of business had passed between them), as being, he thought, worthy of notice, and entirely at the Company's service. The proposition was certainly very liberal, but did not accord with Autotype notions of business. Mr. White was duly thanked for his courteous consideration, but at the same time advised that his ideas were good enough for a patent, and he had better consider the subject in that light, and when he had assumed the position he was entitled to of inventor and patentee he could then, for a sum to be agreed upon, formally transfer the patent to the Company.

Mr. White acquiesced in the reasonableness of this proposal, filed his specification, and in due time acquired patent rights. The claims under his specification were two only, and these were models of perspicuous brevity:—

"1. The use of opaque or non-actinic paper or other flexible material as a support for pigmented gelatine, so that the same can be sensitised, and, after squeegeeing on to an opaque support, can be dried in ordinary daylight, substantially as herein described.

"2. The method of preparing pigment paper for the carbon process of photographic printing, substantially as herein described and for the purpose stated."

The patent has become the property of the Company, and "Daylight Tissue" will be heard of in your advertisement columns.—We are, yours, &c., THE AUTOTYPE COMPANY.

74, *New Oxford-street, London, W.C., May* 29, 1894.

THE ARNHEIM EXHIBITION.

To the EDITOR.

SIR,—Kindly mention in your next issue, for the benefit of your readers, that applications for the Arnheim Exhibition may be sent in up to June 15.—I am, yours, &c., ALB. KAPTEYN.

82, *York-road, London, N., May* 29, 1894.

P.S.—The minimum charge for lantern slides has been reduced from 6*s.* 3*d.* to 3*s.* 6*d.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Studio furniture and backgrounds wanted in exchange for new high-class safety bicycle, value 15*l.*—Address, HARRY EBURY, George-street, Kidderminster.

Magic lantern, three-inch condenser, screen ten feet by ten, and slides, will exchange for lens by good maker.—Address, J. BROCK, 54, Sumner-road, Peckham, S.E.

Will exchange whole-plate camera, three slides, single lens, for half-plate camera and rapid rectilinear lens.—Address, H. HOWELL, care of LIDDLE & SAVAGE, Leeds.

Will exchange 10×8 rectilinear by Voigtlander for 10×8 wide angle by good maker, and adjust difference. Specimen print sent.—Address, G. N. FUTCHER, Photographer, Chichester.

Will exchange 20*s.* case of metal-bodied, rubber-faced type, 300 letters (Old English), with 4-line holder for 100 letters, and 10*s.* sword-stick, for Lancaster's 15×12 or 12×10 "Multum-in-Parvo," complete.—Address, ERNEST SHEEN, 22, Walton Park, Liverpool.

Meagher 10×8 Spanish mahogany, conical bellows camera; whole-plate rapid rectilinear lens; whole-plate camera, square bellows, in exchange for any of the following:—Quarter-plate camera and lens, *carte-de-visite* portrait lens, or wide-angle whole-plate lens.—Address, E. TAYLOR, 195, Cemetery-road, Sheffield.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Arthur Henri Poole, Waterford.—*Portrait of General Lord Roberts.*

William Griffiths Honey, Cork.—*Portraits of George Williams, Organizing Secretary of the Cork Open-air Mission.*

Robert Charles Whitehouse, Manchester.—*Two photographs of triumphal arch composed of firemen and fire-escapes.*

F. PIPER.—We did not retain the address of the gentleman named.

HENRY RYAN.—Try a solution of American potash, or one of caustic soda, either will, we expect, answer the purpose. Sulphuric acid would be quickest, but, of course, that would attack the metal.

F. STONES asks if coating gelatino-chloride prints with plain enamel collodion will prevent their fading.—Unless the prints are perfectly fixed and washed, nothing will prevent their changing if they are exposed to adverse influences.

H. HARRIS.—Immerse the prints in methylated spirit before putting them into the water for washing out the silver, then proceed as usual. This method of preventing blisters was introduced by Mr. W. D. Richmond, and is very effectual.

NOVICE.—1. In making up the developer, the sulphite of soda should be dissolved before the pyrogallic acid is added. 2. Take one ounce of ammonia, and add water to make ten ounces. That is what is meant by a ten per cent. solution of ammonia.

C. BENNETT.—To recover the silver from old negative fixing hypo, pour into it, with stirring, a quantity of solution of liver of sulphur, the strength of which is not material. Cease the addition when you perceive that a smell of sulphurous acid is emitted.

ART.—1. By searching the file at Stationers' Hall. 2. We cannot say, except by inquiry amongst artists or picture dealers; some of them may happen to know the initials. 3. No; you cannot hold copyright in another man's work, except by his assigning it to you.

G. W. C.—1. All the public buildings are worth photographing, for their interest, if not for their beauty. A permit will be required for the Royal parks, to be obtained from the Ranger, by a written application. 2. The back lens will answer the purpose well, but it will have to be stopped down to obtain fine definition.

C. W. WELMAN.—If the camera were held perfectly still, a lens of six inches focus, with a stop of *f*-11, should give a perfectly sharp picture of the quarter-plate size. If it does not, we should suspect that the camera was not held steady. The name of the maker on the lens may be taken as a guarantee of its quality.

INQUIRER.—The Company named do not publish the formula by which they prepare their paper and opals. Hence we cannot give it. Several formulæ have appeared in back volumes, but they require to be used with baths best suited to the paper. If you write to the Company, they will tell you the character of the opal plates they supply.

R. H. B.—The argentometer is not a reliable test with silver solutions that have been much used for sensitising paper, as they show a larger proportion of nitrate than the solution contains—often much more. Had you precipitated the silver as chloride, and dried it, you would have known the quantity of metallic silver to expect. As the market value was allowed for the metal, we should say the return was a fair one.

S. J.—As the people have admitted receiving the negative, sue them in the County Court at once for the amount sent with the order and the value of the negative. This you should assess at what it is estimated to be worth for future copies and enlargements, taking into consideration that the sitter was very popular, and no more portraits are possible. Possibly damages for delay and retaining the negative might be recovered if sued for.

S. O. L. says: "Is there any simple means by which the exposure of bromide paper can be correctly timed in contact printing? The exposure is so short that any little variation in the light has a wonderful effect on the result. I expose to a north light from a window inside the room?"—The best way in contact printing, with bromide paper, is to make the exposure to a gas flame at a fixed distance from it, or to one of a paraffin lamp. By this means a fairly constant light is secured, particularly if a "regulator" be used with the former.

C. W.—We are afraid you will be held to the bargain unless you can prove that there has been a misrepresentation in the returns of the business. In that case a court of law will give redress by setting the transaction aside. According to your statement you have been victimised, but the only advice we can give is to consult a respectable solicitor before the first payment becomes due, and do as he may advise. In purchasing a business very stringent inquiries should always be made as to its *bona fides* before completing the purchase.

OTHELLO writes: "Will you kindly suggest a remedy for the prevention of enamelled prints bulging in the middle when mounted? I use dextrine round the edges only, and when complete they are nice, but next day the middle has bulged up. If it did so evenly, it would not matter much, but it sometimes happens that the highest convexity is at one side or the other. I use P.O.P., backed with note paper rather thicker than this sheet."—Possibly the bulging is caused by moisture. If the prints are abnormally dry when they are secured to the mount, and afterwards absorb moisture, they will expand. Try the effect of backing with stouter paper, and do not make the prints over dry before attaching them to the mount.

CLUB says: "A man I have had for some months as a canvasser on commission has, I find, been embezzling. He has been paid money, and has kept it, instead of handing it over to me weekly as per agreement. He has left, and it now canvassing for another house a few miles from this town. I have written to him, threatening to give him into custody unless he pays up at once, and he dares me to do that at my peril. Surely I can take the fellow before the magistrates, as I can prove, in several cases, he had the money and not accounted for it?"—If the man was paid a weekly salary and commission, he was a servant, and the remedy will be a criminal court for embezzlement. If he was paid a commission only on the amount of business he did, he was an agent, and can only be proceeded against in the County Court for the amount as a debt.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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SINGLE LENSES FOR PORTRAITURE.

is difficult to invest with novelty such a topic as the uses to ich a single achromatic lens can be devoted, in addition to at may be considered as its primary, and presumably its re legitimate, use, and from which its designation as a land-pe lens is derived. But, owing to the continuous accession new and inexperienced members into the ranks of photo-phy, elementary information has to be mingled with that more advanced and experienced classes, and the present will an endeavour to combine both.

Queries are being frequently addressed to us as to whether is possible to take portraits by means of a landscape lens. ssing over the fact that the querist could very easily answer s question for himself if he would only make one or two ıls, we answer that not only is it possible, but some very e portrait photographers give preference to a lens of this ure, more especially if the portraits are to be of large size. know of some who are famed for the excellence of their ge portraits who have long discontinued the use of portrait ses in the production of their works, and have supplied their ces with single ones. The necessity for employing large l costly portrait combinations now no longer exists, as it in the pre-gelatino-bromide days; for, with small apertures, ck exposures can be made. For the average class of work which a photographer puts his lens—that is to say, for ıeral landscape or portraiture—a single lens will be found to ɔserve his purpose.

When working a large combination lens in a portrait studio, is almost imperative that it be more or less closely stopped wn in order to bring into sharp definition more planes than e. When the stop required for effecting this is noted, and s been applied to a single lens of similar focus, the com-rative advantages will probably be found in favour of the gle lens. Tested from the strictly optical point of view, its tical sharpness may probably exhibit a falling off; but this compensated for by the elasticity, so to speak, of the range fairly good definition all over the plate.

In order to see "where we are" in this matter, we have just ken two $8\frac{1}{2} \times 6\frac{1}{2}$ portraits of the same subject, one with a rtrait lens of a good make, the other with a landscape or ıgle lens also of good make. This latter was perhaps the st, but certainly it was among the first made in 1865 by H. Dallmeyer, who sent it out with a much smaller fixed, or gest, stop than it now possesses, for we had not long had it our possession until we found that, while with the original ɔp it gave intense definition, yet a more pleasing kind of finition, for portraiture in particular, was obtained by having the fixed diaphragm very much opened out, by which the time of exposure—wet collodion in those days—was materially diminished, and a softer quality of portrait obtained. We have since had it remounted by Mr. Thos. R. Dallmeyer with an iris diaphragm having a maximum aperture of *f*-8. A comparison betwen the work of this single lens and a portrait combination of similar focus and worked with a similar aperture, has served to convince us of its great value for portraiture, a purpose for which it was not originally intended.

It need scarely be said that, by opening out the working aperture in this way, while much—very much—is gained, nothing whatever is lost, for with an iris diaphragm its original aperture (*f*-16 if we recollect aright) or one as much smaller as is found desirable, can be obtained to suit any special requirement in landscape work.

For portraits on 15×12 plates, or upwards, single lenses are believed to possess certain great advantages over portrait combinations. Several years ago (1871), on the occasion of prizes having been offered by the late R. Crawshay for the best life-size heads, several photographers competed, having had special large portrait combinations constructed for the purpose. The results formed a feature of the Photographic Society's Exhibition that year, and, as they were all placed in a special room, it became known as the Chamber of Horrors. And truly the portraits partook of the horrible; for, in order to get them of the required dimensions, the lens had to be pushed up comparatively close to the sitter—equidistant between ground glass and head. Under the circumstances, there was no depth of definition; if the eye was sharp, the nose and ear were nowhere; and, if the lens were stopped down to equalise these, the exposure required would have had to be prolonged beyond human endurance.

Although that Exhibition served to kill the direct-large-head idea for a time, it has since that time been resuscitated, although not on quite such a scale, single lenses having been employed, and, there being no such razor-like sharpness in them as in the portrait combinations, a more pleasing softness pervades them. However, it is not hazarding too much to say that, owing to the perfection to which the making of enlargements has been brought, life-size direct pictures will seldom, if ever, be attempted in future.

While on the subject of single lenses, we might supplement what Mr. G. Watmough Webster wrote a fortnight ago, in his interesting article on their application to architecture, by observing that the smaller the diameter of such a lens the less will be the distortion arising from curvature of marginal lines that ought to be straight. In practice this may be brought about by placing the stop close up against the lens; but, as in

this position the field will be rounder than when it is at a distance, a much smaller stop must be employed than when it is removed to the proper distance in front. The proximity of the stop does not quite prevent the distortion, but it diminishes it very much.

REVERSED NEGATIVES AND THEIR PRODUCTION.

A CORRESPONDENT, in a letter last week, calls attention once more to the subject of reversed negatives, and comments, more or less adversely, on some of the different ways at present in vogue for producing them, and also laments that there is no simpler method available. With the spread of carbon printing and mechanical processes, reversed negatives are a daily increasing necessity, and, although much has already been written on the subject, we shall here review the methods referred to by our correspondent—as some of the objections to them are scarcely tenable—as well as some others not referred to by him.

In the first place, the old and well-known system of taking the negative through the glass is condemned. This method, it is true, is open to several objections, yet, as a matter of fact, it is extensively worked commercially, particularly by "zinco" workers. We know of some establishments in which the negatives are made, by the wet-collodion process, exclusively in this way. Stripping plates also condemned, but why? The plates supplied commercially for stripping answer very well indeed. An objection might be raised that they are more costly, and generally slower, than ordinary ones. The latter could, of course, be remedied if quicker plates of this kind were required. But any ordinary plate can be easily stripped by the hydrofluoric method, which has so frequently been described and generally adopted. Fluoric acid is certainly not a pleasant thing to deal with in its concentrated form, and exception has before now been taken to its use; but for the purpose under consideration the objection is scarcely valid, as the acid is used in an extremely diluted state, a few drops to the ounce of water being found quite strong enough in practice.

A reversing mirror is, our correspondent says, "beyond the pocket of most of us struggling photographers." Evidently there is a misconception with many as to the cost of reversing mirrors, as we have frequently heard them spoken of as very expensive adjuncts. That is a fallacy. The cost of a plane mirror, silvered on the surface, is, we believe, from one to two shillings per square inch, according to size; and one mirror will serve for any number of lenses, provided, of course, it is large enough for the largest of them. The price mentioned is for the silvered glass alone, but the fixings, which are generally of wood, any one who is handy with tools can quickly make for himself. Hence it will be seen that a reversing mirror is by no means the expensive affair that many imagine it to be.

It will generally be conceded that the simplest way to produce reversed negatives is to take them direct in the camera, and that is the method pursued by those who require only reversed negatives for commercial purposes. This, however, is not always the case with many photographers, especially those whose business is mainly confined to portraiture. They would rather prefer a negative that would serve a dual purpose that is, one that can be used as a reversed one or otherwise. Such negatives can be obtained by using celluloid films instead of glass plates. It must be admitted, however, that with them there is some slight loss of sharpness in printing through the supporting film, but it is very slight indeed if thin cellulc films be used. The same remark will apply to films stripp from glass plates, but inversely. In the latter case, t greatest sharpness is secured when the negative is used as reverse one; in the former, when it is used as a non-revers one.

Perhaps the best way, on the whole, for the general run portrait photographers to obtain reversed negatives is reproduce them from those taken in the ordinary course business. Then they will possess two distinct negatives whic can be used as occasion may require. The system of makir the new negative with the aid of a transparency, though a excellent one, is one that does not commend itself to phot graphers in general on account of the trouble involved.

There is yet another system of reproducing negatives wit the image reversed, and it is somewhat surprising that it ha up to the present, received so little attention at the hands commercial workers. We allude to the method of making negative direct from a negative by contact printing, an taking advantage of the reversed action of light. There ar several ways of doing this, all of which have been full described in these columns. There is the method of Colone Waterhouse, with the thiocarbamides. Then there is tha introduced some years ago by Mr. Bolas, of treating a gelatin dry plate with a solution of bichromate of potash befor exposure. This plan has the advantage that any old or fogge plates that are of no use whatever for other purposes can be utilised. Further, we have the method that Mr. Frewin has worked for some years, which is simplicity itself. It i merely to expose an ordinary dry plate behind the negative sufficiently long—a few seconds in a bright light—to produce the reversed action, and then develop and fix in the usual way, ferrous oxalate by preference being the developer. There are yet other methods of producing negatives, but those referred to are the ones which will probably answer modern requirements best.

From the above it will be seen that there are several methods involving but little trouble for producing reversed negatives, suitable for carbon printing by single transfer, or other processes requiring them, and all of which are capable of yielding excellent results. Therefore we need not sigh for a simple means of obtaining reversed negatives in our daily practice.

INTENSIFICATION DURING DEVELOPMENT.

WITH a plate of known characteristics and a normal exposure there is seldom any difficulty in securing printing density when anything like a proper developer is employed, although with some of the newer reducing agents the task is perhaps not so easy as with pyro.

To obviate the necessity for after-intensification, many workers with the new developers, such as eikonogen, amidol, and metol, have used them in conjunction with hydroquinone, which is noted for the density and contrast it gives; but even such combinations, useful as they may be at ordinary times, sometimes fail under stress of circumstances. This is more particularly so in the case of the so-called "one-solution" developers, which from their very nature permit of little or no modification in use, and, even if supplemented by special restraining and accelerating solutions, offer very little latitude.

But the weak point in connexion with these combined developers is that, while the object is attained so far as

ncerns the increased density of image, very much of the vantage attached to the use of the more energetic though inner agents—such as metol—is lost, and, in fact, the xture is too often little, if any, better than by hydroquinone ne if properly used. The most noteworthy feature in the haviour of both amidol and metol, and, to a less degree, of konogen, is their wonderful power of bringing out detail in bly lighted subjects or with very brief exposures, a feature at specially recommends these developers for studio and stantaneous work, and, in fact, practically shortens the posure. But the admixture of hydroquinone in a measure duces the more energetic agent to its own level, so far as pidity of exposure is concerned, without, however, imparting s own slowness of developing action, the gain being, as ready stated, an increase on the density of the image.

When we consider that the respective qualities that appear be in conflict in the combined solutions are of equal im-rtance in actual practice, it would seem to be desirable, if ssible, to secure both, if not in the same mixture, at least by judicious use of the two agents separately, the one as the veloper proper, and the other more in the form of an tensifier.

Until comparatively recently—that is to say, when pyro and mmonia was the almost universal developer—development nd intensification followed one another naturally, and formed arts of the same operation, the latter function being performed y the gradual modification of the original solution. Now, owever, that the process of development has resolved itself nto the employment of a single solution that can only be aried in use by a greater or less degree of dilution, or, at est, of two solutions that are mixed in definite proportions at ne outset, and afford very little opportunity of after-modifica-on, development and intensification must, as before, be erformed in the one operation, but it can only be by so ccurately timing the exposure that normal conditions are as losely as possible adhered to. The modern methods of de-elopment are, in fact, totally different from that in vogue ve years or less ago.

One of the earliest departures from the old system—we peak now of alkaline development, of course—consisted in the se of two entirely different solutions, as, for instance, ikonogen and pyro, or eikonogen and hydroquinone, the one s the developer, the other for the purpose of giving density. The plan did not, however, prevail for any length of time, if, ndeed, it ever was really seriously adopted, as the simpler nethod of mixing the two reducing agents in one solution upplanted it; but, as already pointed out, the actual ad-antage derived from the latter is merely nominal.

But, if we come to consider the earlier plan—the employ-nent of separate solutions—it will be found to present points hat will recommend it in preference to the other, without ntailing any great amount of extra trouble. It is almost as asy to have two solutions ready to hand for use as required as o have only one; it is indeed far simpler and easier than the ractice of the old collodion days, and only wants systema-ising. The principal questions are what solutions are to be sed, and which is the best method of employing them.

As regards the former, of course each one will have his pet ancy. Many of the users of the newer developers—and they number amongst them some of the oldest dry-plate workers we have—make a practice of saving the used developing solutions n case of over-exposure or when density is difficult to attain. With metol, at any rate, this is sometimes a useful plan, though with amidol and others of the newer agents we have not found it feasible; still, even with metol, it can scarcely be recommended as reliable, as the solution frequently loses its power of giving density as well as its rapidity of action. Where, however, an old solution retains its vigour of action, it may as well be used after a fresh solution of the same kind as anything else; but, from our own experience, we should counsel the use of entirely different solutions, not necessarily of different agents, but solutions mixed on entirely different principles.

For instance, to go back to the earliest of the "stainless" developers, hydroquinone, this, in conjunction with a caustic alkali, soda or potash, forms a quick and energetic developer, too much so, indeed, unless well restrained; but the same reducing substance in combination with a carbonate is a slow but density-giving agent, and may be used with advantage to give vigour to an image brought out by the more energetic solution. But, looking at the peculiar qualities of metol and amidol, we imagine that most of those who essay this mode of working will employ one or other of these agents as the developer, using pyro or hydroquinone as the intensifier. We have ourselves tried many combinations, and can scarcely offer to recommend any one in preference to others, provided the separate solutions are calculated to perform their respective duties in a satisfactory manner.

But there is one point on which a word of advice may be given, and that is as to the order in which the solutions are applied. It may appear somewhat odd to speak of intensification before development, for that is what it practically amounts to, but it is often advantageous to use the vigorous, or density-giving, solution first, and the more delicately acting afterwards, to bring up detail in the shadows of the negative. In cases of known or suspected over-exposure, or with subjects presenting little contrast, this plan will be found the preferable one, for the check that is put on by the "intensifier" is but temporary, and, though it may retard, does not arrest the subsequent action of the "developer," should a miscalculation be made as to exposure. On the other hand, with brief exposures or subjects full of contrasts, let the most energetic developer possible be first applied, and, should density be wanting when the detail has been obtained, then apply the strengthening solution.

With this system in practice, one-solution, that is made-up, developers may become practically useful.

Starch and Iodine.—It is stated to be advantageous in using this reaction—as, for instance, in testing for the presence of hypo—to use potato starch in preference to grain starch, such as wheat or rice, the latter giving a violet or even reddish-brown colouration, but the potato produces a pure blue colour.

A Rare Camera Study.—The old story of the aloe flowering but once in a hundred years is known to be merely a fable, but that its flowering periods are rare is undoubted. Hence our readers should be on the alert to obtain permission in due season to photograph the American aloe now appearing in bud, according to the Secretary of the Royal Botanic Society. The last time one flowered was in 1859, and the plant was said to be over eighty years old. In a very short time it threw up a flower spike thirty feet high, and lasted for some months in bloom. Several other rare and beautiful plants are in bloom, due, he thinks, to last year's hot, dry summer.

An Outsider's Views.—In *Nature* we see the following paragraph: "It is well known that many amateur photograpers

send their negatives to professionals to be printed. The Indian amateur, however, has usually to make his own prints, as there are few professional photographers in the far East to undertake the work. To make up for this dearth of available assistance, the *Journal of the Photographic Society of India* reports that the Society, of which it is the official organ, has established a printing department for its members. Though such a departure might be adversely criticised in the case of a British society, it may be pardonable in India."

New Cooling Apparatus.—There are many experiments in connexion with emulsion or gelatine work generally where the use of a convenient refrigerating apparatus, not requiring the employment of ice or large bulk of crystals producing temperature-lowering when dissolved, would be found very convenient. Mr. H. N. Warren describes such an apparatus of simple character in the *Chemical News*. It consists, in effect, of a glass flask containing an ounce or so of a mixture of ether and bisulphide of carbon, and fitted with a rubber tube passing through the neck and ending in a glass point placed just above the liquid. This flask is placed within the liquid to be cooled or frozen, and then air blown through the tube by a pair of bellows or other blower. The quick evaporation brought about produces such a reduction of temperature that in a short time the outer fluid becomes quite frozen.

Obtaining the Moon's Parallax by Photography.—In *Ciel et Terre* M. P. Stroobant makes a suggestion for carrying out this idea. He says: "The application of photography to the determination of the exact instant of disappearance or of reappearance of a star would permit, without doubt, the attainment of great precision, especially when these phenomena occur at the dark limb of the moon or during eclipses." And he further adds that, "as about every nineteen years the moon passes over the Pleiades in conditions more or less advantageous for observation, and this phenomenon will occur next year, might not the occasion be profitably used in securing a number of photographs at various observatories?" A new value for the lunar parallax might thus be obtained with the observing stations sufficiently separated.

Photography on the Stage.—In the play of *A Society Butterfly*, now running at the Opéra Comique Theatre, the authors indulge in a little playful satire at the expense of photography. A lady interviewer, accompanied by a photographer, suddenly and unceremoniously invades the drawing-room of a fashionable beauty with the object of interviewing the latter and describing her surroundings. The photographer blandly and uninvitedly sets up his camera in the apartment. The lady's husband unexpectedly enters, and indignantly orders the invading pair from his house. The woman journalist, however, has her revenge by "kodaking" the husband before she takes her departure. It is an amusing bit of exaggeration, but, as Ibsen says, even lady journalists "don't do these things;" and, if they did, they would soon get tired of trying snap-shots in drawing-rooms, unless their only object was to waste sensitive films.

The Photographic Salon.—Although the summer is hardly yet upon us, arrangements are already in progress in many quarters for holding the customary autumn photographic exhibitions, as will be seen by our list of forthcoming exhibitions given elsewhere. The "Photographic Salon" is to be again held at the Dudley Gallery, but, unlike the conductors of other exhibitions, its promoters do not vouchsafe any information as to how or by whom the exhibits sent in are selected and hung—who, in fact, perform what are the equivalent of judicial functions. Are the latter to be retained in the same hands year after year? and by whom is the Selecting Committee appointed? In the interests of those likely to submit pictures for exhibition, we would suggest that some information on the point should be made public. The interests of the Salon itself are also covered by the same suggestion, for, once it became felt or understood that the Committee was a permanent one of, say, two or three wl appropriated the best positions and a generous portion of the wa space to themselves, we should not anticipate that any considerab section of the exhibiting public would continue to support th Salon.

Latitude and Longitude by Photography.—In ou contemporary, *Nature*, over the signature of C. Runge, there appeare last week a most interesting letter, describing how the latitude an longitude of a place might easily be determined by any non professional observer by a single photographic operation, aided by watch. The writer observes that "the observation part of the busi ness, which consists in taking the photograph, is separated from th measuring and calculating part, and may be performed by differen persons at different times and places. For taking the photograph n scientific apparatus is wanted besides the camera and a watch (true to about a second in a few hours). No mathematics, an very little astronomical knowledge are wanted, only the measurin the plates and the calculation requiring some scientific training Those of our readers who feel interested in the matter may fin the whole article on pages 102–3 in the periodical referred to Briefly it consists in making the camera point straight upwards t the zenith, taking a photograph of star trails, and then turning the apparatus half a turn round and then taking another trail picture The way the camera is trained is ingenious. It is placed lens upwards in a tin box, which, after due weighting, is placed to float in another vessel of water. The angular relations of the corresponding trails, together with the assistance of an almanac with astronomical data, enables the required latitude to be found, with an error not exceeding one-fifth of a minute. Herr Runge further states in his letter that the same negative will, if the time is noted each time the cap is withdrawn and replaced, enable the deviation of a watch from the mean time of the place to be ascertained.

SUBSTITUTES FOR ALUM.

Since I ventured a fortnight ago to suggest the employment of gallic acid or tannin in place of alum for hardening the surface of gelatine prints I have been able to give both substances, but especially the latter, a pretty fair trial, though, so far, not with any very encouraging results.

Theoretically, tannin might be accepted as the most perfect indurator of gelatine that could be selected, and one that from its nature might be expected to exercise but little chemical action upon the silver image itself, although in the presence of soluble silver compounds it could scarcely be looked upon as a desirable adjunct to the film. While, however, the hardening action of tannin upon gelatine is an undoubted fact, it possesses other properties that must also be reckoned with, notably its effect in causing the contraction and reticulation of gelatine films, for which purpose it has been used in more than one photo-mechanical printing process for the production of an artificial grain.

Bearing this in view, I judged that it would be necessary to use this agent in comparatively weak solution, and on trial this proved to be the case, other circumstances combining to render the use of a very weak solution absolutely necessary. It seems that the action of the tannin solution, even upon the surface of the gelatine, is very slow, while the decomposition of the solution itself is comparatively rapid, from which it results that, before any useful end is gained from the application, the prints are stained in a manner not at all conducive to satisfactory appearance.

The strength of solution I eventually decided upon as being within the bounds of safety was three grains to the ounce of water, or two drachms to the quart. I may here remark that the average sample of tannin of to-day varies very materially from that in general use twenty or twenty-five years ago, when the tannin dry process was a favourite among amateurs. Then the tannin dissolved quickly in water to almost any extent, forming an opalescent solution, which no amount of filtration would clear, and which only became bright

after it had stood for some days until a peculiar fungoid growth deprived it of its suspended matter. Now, three or four separate samples I have tried behave in a perfectly similar manner, they dissolve very slowly, remaining suspended in an undissolved condition sometimes for some hours, but eventually dissolving and forming a perfectly bright and clear solution that does not in the least require filtration.

But the greatest difference lies in the behaviour of the solution when exposed to the air. In past days, when we used to employ a fifteen or twenty-grain solution of tannin as a preservative for collodion dry plates, the preservative when in use was necessarily exposed to the air in a dish, possibly for hours at a stretch, for in those days the preparation of half a dozen or a dozen plates formed the occupation for a whole evening. The preservative solution was kept and used over and over again, and although in course of time it became gradually darker in colour, until in bulk it looked almost black, it never exhibited the slightest tendency to become muddy from oxidation or other chemical change, retaining its perfect brightness until the last.

Now, however, the clear solution of fresh tannin, if poured into a dish and left for a few minutes, becomes covered with a glassy transparent scum, and deposits a fine yellow sediment, which, on returning the solution to the bottle, converts it into a messy-looking mixture that it is compulsory to filter before further use. This behaviour was so new to me when I first noticed it that I thought I had got hold of a bad and decomposed sample of tannin, but others obtained fresh from thoroughly reliable sources have turned out precisely similar. What constitutes the difference I am unable to say.

Returning to the application of the tannin solution to the gelatine prints. The three-grain solution already mentioned has a powerful astringent taste, and if the fingers be dipped into it gives them a decidedly rough feel when they are rubbed together. Not so, however, when applied to the prints. It must have been noticed by every worker of gelatine paper that when it is dipped into alum it instantly loses its sticky or adhesive feel and becomes rather repellent. When the same print is dipped into the solution of tannin it is some time before any change is apparent, and then it takes the form of an apparent softening of the gelatine, which acquires a slimy feel, and is more easily damaged by abrasion. If one portion of a wet print be immersed for five minutes in the tannin solution, this difference will be readily detected on passing the print between the fingers; and if it be then washed, dried, and rewetted, there will still be a slight difference detectible, but in this case the "tanned" portion will have more the kind of feel that is given by alum, though it is very slight.

The ultimate effect of alum on the print is to harden, or, if its action be sufficiently prolonged, to render the gelatine insoluble, but its chief advantage in practice is to prevent the surface of the prints from sticking to anything they may come in contact with; to, in fact, facilitate the manipulation. So far as this function is concerned, tannin altogether fails, no matter what strength may be employed; while, as to its effect in rendering the gelatine insoluble, it is even worse, at least at the strength I have used it.

After five minutes' soaking in the three-grain solution, the gelatine still remains soft enough to melt if held for half a minute between a warm finger and thumb, and, after varying periods from five minutes to an hour, the effect was not sufficient to prevent the solution of the emulsion surface in water very little over 100° Fahr. It may be said that this is not a fair test, but when I add that, after an hour's soaking in the tannin solution and subsequent washing and drying, the gelatine still remained perfectly soluble in water at the temperature named, I think it may be conceded that tannin, at least at that strength, is not of much use. After treatment with alum and drying, the print remains undissolved by water at a much higher temperature.

Prolonging the immersion, even if it were practically feasible, is of no use, as a print left in the tannin solution all night, although it had acquired a distinctly "leathery" feel, remained, after washing and drying, still perfectly soluble; but, had it been otherwise, it would have been useless, from the deposit and stains formed upon it. As for strengthening the solution, as I have already stated, the decomposition of the tannin is an insuperable objection.

Gallic acid is free from the latter fault, though its hardening action, *per se*, is scarcely sufficient unless the application be unduly prolonged. In conjunction with alum it acts very energetically, but then we might as well employ the alum alone, so that, on the whole, I think we must turn away from such substances as possible substitutes.

Some of the iron salts—the sulphate, for instance—have a hardening effect on gelatine, but they are dangerous agents to introduce into a print, owing to the liability to form iron stains, the prevention of which would be as difficult, or require as much care, as the use of alum entails. Alcohol forms another possibly useful agent in facilitating the manipulation of the paper, though it would exercise no permanent hardening action, and it appears to be entirely free from any possible injurious action, unless the new mineralised spirit differs in that respect from the old. In the early days of gelatino-chloride paper I frequently prepared the prints for mounting by immersing them in methylated spirit, blotting off and partially drying before applying the mountant. This may be worth trying with the new spirit.

In conclusion, the substitution of chrome alum for the ordinary would seem to offer some advantages, and to be worth trying.

W. B. Bolton.

PHOTOGRAVURE.

[Photographic Society of Great Britain.]

The admirable series of lectures, delivered before the Affiliated Photographic Societies by Mr. Denison in the spring of 1893, have dealt so exhaustively with the details of the process known as Photogravure, that in giving this demonstration I have not thought it worth while to do more in the accompanying paper than pass in review the various steps by which an intaglio etching on copper is obtained by photographic means. In order to make the steps as clear as possible to the members, I have had a syllabus printed which is in your hands, and I now propose to proceed with the demonstration simultaneous with the reading of these notes, so that they may explain, as the demonstration proceeds, the various stages.

Class of Negative.—The class of negative most suitable is such as gives a good result by any of the printing processes. A bright sparkling negative will always give a good plate, but I don't find that any satisfactory result can be got from a soft flat negative. The negative should be as perfect as possible. It is absolutely useless to work from a faulty negative. Contrasts may be increased on the negative by retouching. Such contrasts are desirable, because the tendency of the etching is to reduce them somewhat.

Transparency.—From the negative to be used a reverse transparency is required, and this is usually obtained by means of the carbon process.

The autotype transparency tissue can be used, sensitised on a three per cent. bath of bichromate of potash. The best results are obtained by squeegeeing the tissue on to plate glass. It then strips off with a highly glossy surface, and better contact with the negative is secured. Good transparencies can be got also on gelatine plates, but, owing to the necessity for a reversed transparency, recourse must be had to copying in the camera. It has been recommended on previous occasions that a strong transparency shonld be obtained. I do not incline by any means to this view, and prefer to have them rather thin than otherwise.

If possible, I like to have such a transparency as will give me, when printing the negative resist, a sufficiently exposed picture with six tints of the Woodbury photometer on tissue three days old. If the transparency is of such a character, six or seven tints of the Woodbury photometer will give bare copper in the deepest shadows with a sufficiently strong film in the highest lights to enable the etching to be completed in about ten or thirteen minutes. Mr. Ernest Edwards, the President of the New York Photogravure Company, who gave me many facilities when I was in the States last year, uses transparencies on gelatine plates almost exclusively. The negative as well as the carbon transparency will require masking in the ordinary manner. The masking strips are preferably laid on the glass side of the picture.

Copper Plates.—The copper plates used should be selected with great care, as more failures occur in this process from the use of badly made and impure plates than from any other cause. It is well to get them bevelled (after you have had some little experience of etching) because the cost of bevelling is not great, and it is always dangerous to bevel a plate after it has been etched.

The plates may be cleaned in several ways. The method generally adopted is to rub them with a pad of prepared cotton-wool and a

cream of double washed whiting. The whiting is broken up in a cup, and some very dilute ammonia, about two per cent., is added to form a thick paste. The plate should be rubbed in circles to agree with the polishing. If the ammonia is too strong, the copper plate shows marks of discolouration. Such marks do not affect the result, but they are best avoided.

Graining.—Mr. Denison explained in his lectures the use and functions of the grain, and for the benefit of those who were not present I reproduce a drawing, showing what the effect of the etching of an ungrained and a grained plate would be. You will see in Diagram 1 that, if a broad mass of shadow were etched on an ungrained plate, it would present somewhat of the appearance given.

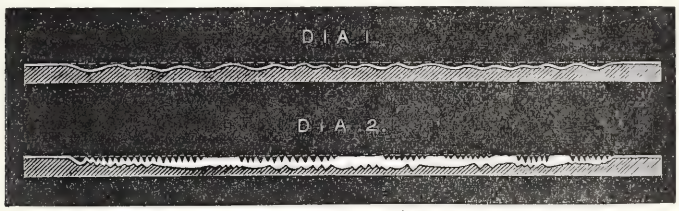


Diagram 1. Ungrained plate. *Original surface of plate.*
Diagram 2. Grained plate. *Original surface of plate.*

In printing the plate a stiff copper-plate ink is laid on all over the plate, and it is afterwards removed by wiping the plate. In the case of a plate similar to Diagram 1, where no grain exists, the effect of the wiping would be to draw out of the recessed or etched portion nearly the whole of the ink.

If, however, prior to etching, a dust of some sort capable of being attached by heat to the copper is deposited on the plate, and also capable of resisting wherever it lies, the action of the acid, it is evident that we shall get a result similar to Diagram 11. Every little particle of dust ensures a sort of island of bare untouched copper, and it is the existence of these innumerable little islands of bare copper, not only in the shadows, but over the whole plate, which invest it with the power of holding the ink. Wherever the grain has resisted successfully the etching, a key has been formed which enables the full depth of ink represented by the depth of the etched shadow or half-tone to be transferred to the paper. You will see at once that, where the depth of etching is greatest, the greatest danger exists of undercutting or scouring away these islands, and the conclusion is naturally forced upon us that no etching process can be considered otherwise than a sort of compromise where the grain is of the same character throughout. A process which would provide for the employment of a grain of graduated coarseness from the deepest shadow up to the very finest grain in the highest lights would conform absolutely with the theory. Such a process has been the aim and endeavour of every experimentalist, and such processes are in existence at the present time, but the details are not sufficiently public to enable them to be described satisfactorily.

Various substances have been used from time to time for producing grain. Any gums which can be attached by heat to the copper can be used. Powdered bitumen is the most commonly used. A graining box, such as you see here, is necessary. The sectional area depends on the size of plate to be grained. There should be at least three inches clear all round between the plate and the sides of the box. The greater the depth of the box the better. For the sake of convenience, I have only brought a small one here to-night. The one I use at home is two feet six inches high and eighteen inches square. They should be lined inside with a damp resisting paper with a glossy surface. The large box previously described is lined inside entirely with tin, and I have found this answer well. In damp weather it is well to warm the box well in front of a good fire before using it, turning it round and over in front of the fire. The graining is very irregular if the inside of the box is at all damp.

The box is turned round in its bearings not rapidly. It should be well struck on the top and sides at each revolution, the object being to detach any particles which may be adherent and prevent their falling on the plate while it is resting in the box. After some twenty turns the box is brought to rest, again well struck all round, and allowed to rest for some seventy-five seconds to allow the coarser particles to settle. The time during which the box rests before the plate is admitted varies very considerably. It depends entirely on the quantity and coarseness of the grain in the box and the character of grain desired. If you are etching a plate where there exist broad masses of light and shadow, a coarse grain would probably be best, and less time should elapse before putting the plate in. If, however, very fine delicate work, such as portraiture, is in hand, the time may be one and a half minutes. The plate is dusted carefully with a camel's-hair brush, and laid in the box, and during the time it is in the box the box must not be touched or the floor shaken more than can be avoided, as a single coarse particle of grain falling on the plate off the roof or sides of the box might necessitate regraining.

Most of us, I think, were much puzzled in the early stages of our work at finding the plates grain in a very irregular way, but this difficulty has now been entirely got over by placing the copper plate on a piece of glass or any other support somewhat larger than itself. The irregularity was, no doubt, due to eddies formed by the edge of the copper plate. The dust in its descent meeting the copper plate, a portion of the cloud was, so to speak, sheared off all round, and it was this shearing of the dust cloud all round, which, no doubt, by the formation of the eddies, caused irregular and pattern graining round the edge of the plate.

Most beginners err in not getting sufficient grain on the plate, the subsequent etching eating away the little grain that is there. About three to three and a half minutes will give a fairly good grain.

Heating the Grain.—The plate, when it has sufficiently grained is gripped in a small pin vice, such as you see here, a piece of stiff paper being inserted between the jaws of the vice and the polished copper, and heated over a Bunsen burner. It should be heated very regularly, a little more heat being applied at the end where the vice is, owing to the cooling effect of the vice. It will be seen, if the plate is watched carefully, that it will acquire a sort of brown violet colour, which will spread over the whole plate in advance of the burner as the plate is moved. The plate should then be held up and looked at by reflected light, the eye being kept low on the plate. If the grain still looks brown, it is not melted sufficiently; but, if it has a steely grey appearance all over, it is right, and can be laid down to cool. Do not fear giving the plate a real good warming. The danger of overheating with bitumen grain is not so great as with resin.

The plate should now be allowed to cool spontaneously, which will take a few minutes. Examined under a magnifying-glass, the copper plate should appear to be peppered all over with little black particles; examined by reflected light, it should look a steely grey blue colour.

Negative Resist.—In printing the negative resist which is to be developed on the grained copper plate, I have found the red autogravure tissue manufactured by the Autotype Company of most service. It is, as you will see, a thinly pigmented orange-coloured tissue, and it allows the progress of the etching to be easily seen. It is not sold in a sensitive condition, but can be obtained in half rolls. It is sensitised on a three per cent. bath and squeegeed on to plate glass as previously recommended. As it is of the highest importance that the picture should be developed symmetrically on the copper plate, some care must be taken to ensure this. In addition to a mask on the face of the transparency, I find it well to have a carefully cut mask about $\frac{1}{8}$ inch larger on the film side. The tissue is then cut so as to overlap about $\frac{1}{8}$ inch on the inner mask, and register lines are drawn on the mask, on the top and one side, and the tissue carefully adjusted to these. The top of the tissue is marked, and I have found it well to secure the tissue by pieces of gummed paper in its correct position, so as to obviate the possibility of its shifting while the frame is being tightened up.

For the purpose of ensuring that the best exposure has been given to the negative resist, a trial or pilot resist should always be printed and developed on to a piece of opal glass. This precaution will often save considerable disappointment.

The resist, having received its exposure under the transparency, is laid down on the grained copper plate in cold water in the usual way. The upper portion, which has been marked in pencil, is adjusted so as to give an equal margin on the top and the two sides, the lower margin being left about double the width, to permit of a title if necessary. Allow the tissue to soak thoroughly before attaching it to the copper plate. If this is neglected and the paper stretches afterwards, the probability is that it will either frill in development or strip off the plate when dry.

The development is carried out in the usual way. The temperature of the water should be maintained at from 98° Fahr. to 100° Fahr. until the support will nearly float off. Do not attempt to strip the support until the gelatine has thoroughly softened, or crape markings will be formed across the plate which are very difficult to dissolve off, and will in all probability be found in the finished etching.

The temperature of the water may be increased to 100° Fahr. towards the end of the development. The latter should not be hurried, as it is a matter of extreme importance that all the soluble gelatine should be entirely removed from the film.

Drying the Plate.—The plate may be dried spontaneously, in which case care must be taken to protect it as much as possible from dust.

Drying off the Plate.—It may also be dried off with methylated

spirit, but this course can only be followed where a grain not soluble in methylated spirit is used. Methylated spirit cannot be used where a resin grain has been employed. In drying off the plate with spirit, a mixture of half spirit and water is used first. The mixture is poured on top edge of plate and allowed to flow regularly down, driving the water and gelatine scum in front of it. The spirit may then be gradually strengthened until at last pure spirit is used. The plate is then fanned dry. While the plate is drying there is considerable danger of dust particles settling on the plate, and it is well to hold the plate inclined downwards at an angle, and fan upwards. In addition to this, I have found it well to dry the plate off with spirit directly it comes out of the hot water at 100°. The spirit does not then cool the plate to so low a temperature, and the danger of dust particles settling on the plate from that cause are more easily avoided.

Varnishing Margins.—When the plate is dry the margins are varnished. Any good bitumen varnish or stopping-out varnish is used. The lines should be ruled first with an engineer's ruling pen, and afterwards filled in with a brush up to the bevel edges and over the back.

Hold the plate, when dry, on a pneumatic holder, and work round the sharp edges and corners, so as to secure that the whole of the bare copper is covered.

Preparation of Etching Solutions.—The etching solution consists of perchloride of iron. A considerable quantity of the dry perchloride is wanted to make a reasonable quantity of the various solutions.

It is well to buy a seven-pound bottle or jar of the perchloride from any good manufacturing chemist. I prefer a bottle, because the colour and condition of the solution can be seen best. Hot water is poured into the bottle until the salt is entirely dissolved. It is very deliquescent. The resulting solution will probably measure on a Beaumé scale about 41°. In this condition the etching solution acts very vigorously and irregularly, and no dependence can be placed upon it. This action is well understood by chemists, and is probably due in this case, in large measure, to the fact that the solution, when first prepared, is acid.

The best method of neutralising it I have found to be as follows:—Obtain a large enamelled stew-pan containing about a gallon. They cost about 2*s.* 6*d.* Pour the solution into this, dilute it considerably, and then add the red oxide of iron of commerce, stir it up thoroughly, and keep it boiling and simmering over a fire for several hours; then put it aside for a week to settle. Decant or pour it into the big bottle, and leave it for another week or ten days to settle again. Then filter it through a wash-leather filter, and boil it again until it has returned to a strength of 43° Beaumé, when it will be ready as a stock solution. From this form, say, six solutions of the following strengths, 43°, 40°, 38°, 36°, 33°, and 30°. This will give you a good stock from which to select. Do not have less than, say, twelve ounces of each solution, as they improve after every plate is etched.

Etching.—The solutions before etching should be warmed up to 70° Fahr., and by the time the etching is completed they will have reduced to about 65°. Between these temperatures the etching should proceed well and regularly. The dish should be warmed up to the same temperature. An inspection of the trial resist will determine what the strongest solution to be used should be. If the resist has been strongly printed with a view of bringing out detail in the shadows, the lighter portions may be somewhat over-printed; and, as it is possible that the plate at its later stages may necessitate somewhat prolonged etching, it is well to omit altogether the strongest solution, as otherwise the deep shadows will be too heavily etched. There is always a difficulty, however, in getting a satisfactory result from an over-printed resist, and the film in the shadows should be thin enough to show interference colours. Although detail may not be visible in the shadows, still it will be found to be there after the etching is complete. The character of the trial resist will determine, after you have had experience, exactly what the strength of the solutions should be, and what the policy of the etching should be.

Having started the etching, so soon as the biting actually starts watch it carefully. It will attack the deepest shadow represented by bare copper, and it is advisable, until you have gained some experience, to keep the No. 43° or 40° solution on the plate for a definite time, only, say, one minute. It should then be poured off, and the next solution added. It will now be observed that new portions of the film will be attacked. The length of time during which each solution should be allowed to act cannot be defined. It is purely a matter of experience, and you must not mind spoiling a number of copper plates in order to get the experience. Even commercial houses, who are working the process daily, do not invariably expect to get a satisfactory result at the first etching, and very often several plates have to be etched before the best result is got. This fact has always been a great comfort to me.

The golden rule to bear in mind is, that each solution should be allowed to act as long as it will, and, when it has apparently ceased to attack new places, it is time to change it. Bear in mind that it is not necessary by any means to go through the whole range of your solutions. Probably three solutions would be ample, but the total time of etching is of the greatest importance. Unless a plate has received at least some ten or twelve minutes in the bath, it will not be etched deeply enough to print, and in getting out the high lights remember that, from the appearance of the last high light, a time of some two or three minutes is required before removal to give the printing power even to the weak detail.

The etching, therefore, will proceed until the lightest detail is out, and probably only such portion as will be represented by nearly white paper remain. When these have etched all over, it is recommended to at once remove the plate. I prefer leaving it in the bath for some one and a half minutes or so after it has become entirely clouded over.

Cleaning off the Film.—Immerse the plate at once into a solution of potassium carbonate. This converts the perchloride of iron into carbonate, and the film can be rubbed off with the finger. It is then washed under a tap, dried, and the bitumen varnish removed with a pad of cotton-wool and benzole. This is followed by an application of turpentine, then methylated spirits, and, lastly, the plate is rubbed gently with the whiting paste used for cleaning it, but the paste should be much thinner.

It may then be put into an extremely weak solution of sulphuric acid, one drop to an ounce of water, after which it will be ready for printing in a copper-plate press. H. Wilmer.

OUTDOOR PHOTOGRAPHY.

[London and Provincial Photographic Association.]

In giving this short paper on such a well-worn subject, I can tell you very little that is original, but shall rely for interest and profit on the discussion which usually follows the expression of any opinions, no matter however well established and generally accepted.

I intend to give, in a brief way, a few ideas, gained in nearly twenty years' practical experience of outdoor work.

In the first instance, I shall consider the apparatus most suitable for this class of work. I have found that the prevailing fault in the selection of a camera is to sacrifice many good points for lightness. I believe that for general outdoor work nothing can beat a square-bellows camera of long extension, a front that is fixed in focussing, and a movable rising front, which will enable the lens to be raised or lowered to the full extent of the bellows of the camera. I consider this rising or falling front to be a very important feature in a camera to be used for architecture. I show now a simple device, by which I accomplish this object without adding to the size of camera or disfiguring it in any way. Behind the ordinary rising front I fix a movable shutter, which can be fixed easily, so that it increases the rise or fall of the lens. I have one other point in connexion with the camera that has proved extremely useful in special cases. I dare say that there is hardly any one with much experience, in London or other crowded places, in outdoor work who has not met with the awkward fact, that the very point the view is to be taken from is impossible, for the reason that, although the picture may be focussed, and the camera may be placed there, it is impossible to insert the dark slide, because the camera is only arranged to receive it from the right. In a very simple manner I arrange to insert the slide from either side. I have found this dodge extremely useful in cases of light and air, where the exact position of the camera is important. We now come to the question of lenses. This is connected intimately with the question of the camera. I remember, a long time ago, reading the report of one of the meetings of this Society in which a strong discussion was raised by Mr. York saying that a swing back was of little use for architecture. At that time I was much astonished at this opinion from so clever a worker. I had worked with lenses that were considered, at that time, the most efficient wide-angle lenses that could be obtained, and yet thought that in special cases the swing back could be utilised with advantage when the utmost possible with these lenses had been obtained with the rising front. For instance, in photographing the choir in Westminster Abbey, after raising the front as far as the field of the lens would permit without cutting off the corners of the plate, I found that, by careful adjustment of the swing back, I could include more of the roof and be rid of too prominent a foreground, and yet obtain rectilinear lines by the the use of the swing back. With the advent

of the new lenses, particularly the anastigmatic, these conditions are much altered in consequence of the much larger field covered by these instruments. I now find that in almost every case the subject can be included by the free use of the rising front. I will give some idea of the extent of this improvement. Using a well-known wide-angle lens of the old type, issued by an eminent firm, the focus being eight and three-quarters of an inch, I found three inches the utmost rise permissible to cover a 12 × 10 plate; with one of the modern lenses, the focus being the same, I can raise the lens five inches and yet obtain perfect illumination in every corner. In using these lenses without experience it is not always an unmixed advantage; you include too much subject, and, if it should happen that the superfluous subject should be sky or any surface reflecting much light, it will prove troublesome by lighting up the bellows of the camera, instead of the plate, causing fog. I find a great advantage in cutting off this light by means of a simple shade fixed on the camera by rods, which can easily be adjusted, with the focussing cloth, to cut off any sky or brightly lighted object not included in the picture. These rods can be fixed in any position, and are of great use in many cases where the light allowed to enter the camera would fall on the bellows and cause fog.

We will now consider the question of plates. A great deal has been said and claimed for plates which are reputed to cure halation. I have never found a plate that will cure an effect that is invisible in many interiors to the eye. I mean the halation that is natural to the subject. I admit that a thick film will stop halation from the back of the film, but what it can do in the case of a halo seen in front of the camera I fail to see.

Halation is caused in two ways: first, by the illumination of dust or fog-laden atmosphere in the subject which is natural to it; secondly, by light passing through the film and reflected again on to it. The cure for the first kind is to wait for a clearer atmosphere, and it is only the second kind that the plate can influence. This halation can be mitigated to a great extent in two ways, either by the use of a thick film, or by a film so coarse in structure that it breaks up the light, and destroys its penetrating power. I have tried both kinds of plates, and find a medium thick film of the matt-surface kind most effectual, and, if backed, is as near perfection for non-halation as anything I have tried. Isochromatic plates are extremely useful, and I think their value is less appreciated in London than it should be. There is scarcely any distant view in our smoky town that is not rendered with less haze by the use of a yellow screen and an isochromatic plate, and I seldom photograph on a smoky or blue-hazy day without using both, finding detail almost obscured to the eye rendered much more distinct by this means.

I shall devote the conclusion to a few remarks on development. I don't intend to be dogmatic about this subject, but must say that I have not yet found anything to excel for general use pyro and ammonia. I use a ten per cent. solution for stock mixed thus:—

1.

Water	10 ounces.
Sulphite soda	4 „
Citric acid	1 drachm.
Nitric acid	20 minims.
Pyro	1 ounce.

2.

Bromide of potassium	1 ounce.
Water	10 ounces.

3.

Ammonia	1 ounce.
Water	10 ounces.

I find with this developer I can get any result by combining the solution in varying quantities of water, and by working exposure with developer any variety of density and gradation is possible. For a subject of average contrast one drachm of each solution in three ounces of water give a good printing negative on a good plate; for thin plates double the pyro, and be sure not to over-expose for subjects with strong contrast; increase the water to four ounces and use less pyro for undertoned exposures; substitute dry pyro for No. 1, and develop with water slightly warmed, diluting in the same way as for strong contrast. ERNEST MILNER.

VOLATILISATION OF METALLIC SALTS DURING EVAPORATION.

YOUR notes on the above remind me of the following effect noticed when boiling down a quantity of old nitrate baths. I need scarcely say it was in the wet-collodion days, when the nitrate bath was a power in the land, and no trouble was thought too great to provide baths of irreproachable quality. It was a rule, and a good one, I believe, when baths showed signs of getting out of order, to first add a few drops of dilute nitric acid, which frequently set matters right, but, if it proved unavailing, to put aside the bath for more radical treatment, namely, boiling it down, fusing the dry salt to be again made up with water to the proper strength. This was effected by evaporating the solution placed in a large porcelain dish on a sand bath, and the application of heat. When the water had nearly evaporated the nitrate was placed in a smaller dish, and the heat continued until the salt had fused. It was noticeable that occasionally, and just at the point of fusion, a peculiar odour was given off, and the next morning every exposed part of a large room in which the operation had been conducted was covered by minute specks; this was observable on any white paper, old envelopes, &c., that had been scattered about, as a sort of fine grain, more thickly deposited the nearer they happened to be to where the evaporation and fusion had taken place; it was thought that the salt had evaporated and diffused through the atmosphere of the room, and falling on organic matter had darkened by the action of the light.

The amount thus distributed over so wide an area did not perceptibly waste the material, so far as mere observation went. Owing to the circumstances, no accurate weighing was practicable. The effect was noticed and passed by. One peculiarity was that no one employed perceived any metallic taste, as might reasonably have been expected had any metallic salt been diffused in the atmosphere of the place, but only the odour, something of the character of an old bath in good working condition, which those acquainted with wet-plate work will readily recognise. The room was some forty feet by sixteen, and must have been impregnated with the former throughout its whole area, and surfaces exposed to its action in its remotest parts were plentifully spotted. This effect did not invariably take place, although the boiling down and fusing were conducted in the same manner time after time. EDWARD DUNMORE.

THE DEVELOPMENT OF THE ASTRONOMICAL TELESCOPE.*

HAVING referred to the necessity for having the aid of an independent pendulum for governing that of the telescope clock, as described by us last week, Sir Howard Grubb continued:—

There is another very important reason why an independent control is necessary. When an error occurs in the clock driving, owing perhaps to some morsel of adventitious matter in the bearings of the polar axis, or some little extra stiffness due to want of perfect balance, &c., the tendency of all these governors is to bring the *rate* of the clock which has been disturbed back again to the normal. This answers perfectly well for visual work, because, if such an accidental error does take place occasionally, it merely means that the star slightly shifts in the field and the wires can be again brought up to the star and a satisfactory measurement taken, provided that the image does not again shift during the few seconds required for taking the observation.

But in the case of the photographic telescope such an error would be fatal, because the star has already impressed the photo plate at one certain point. When the error occurs the image shifts, and, even if the rate of the clock continues perfectly right for the whole of remainder of the exposure, the result will be, of course, a double or distorted image.

In photographic work we require some arrangement by which any error which is accidentally introduced will be effectually and as quickly as possible wiped out, the star image brought back again to its original position on the plate and then the clock to resume its normal rate, and this is a condition which no uncontrolled clock can fulfil. The only solution which has yet been suggested to fulfil these conditions is to have some means by which the clock of the equatorial (which, as I said, goes well and smoothly for short intervals) is checked and controlled every second from an independent pendulum.

Suppose, now, we have our clock as perfect as is possible, it is further necessary to see that that perfectly uniform motion is transmitted to the instrument; in other words, that any gearing between the controlled clock and the polar axis be as far as possible without error. This gearing consists mainly of the endless screw, called the right ascension screw, and the toothed sector. The precautions taken for the ensuring of this perfection have been elsewhere described, and are of too technical a character to deal with here, but one observation only I would desire to make.

In a recent paper by Professor Pickering, commenting on instruments

* Concluded from page 341.



SIR HOWARD GRUBB, F.R.S.

President of the Photographic Convention of the United Kingdom, 1894-5.

From a negative by Werner and Son, Dublin.]

he saw during a recent visit over here, he is kind enough to make complimentary allusions to some of these arrangements, but he takes exception to the use by us in this country of long-radius sectors for driving the polar axis instead of entire circles. Perhaps it may be well, therefore, if I take this opportunity of saying why we prefer the sector.

Bear in mind that the greatest possible perfection of clock-driving is what we are aiming at, and you will easily see our reason for adopting the sector. When a sector or portion of a circle only is used, it is possible to get a radius much greater than in the case of an entire circle.

No mechanism ever made is absolutely free from error. Call the residual error of this screw anything you like, one-ten-thousandth or one-twenty-thousandth of an inch, whatsoever that error be, its effect on the accuracy of the driving of the telescope will be exactly in the inverse ratio of the radius at which it acts, therefore any given errror will only have one-third the effect on the driving of the telescope if working (as it may in a sector) at three times the radius. One-ten-thousandth of an inch at, say, ten-inch radius will produce an angular error of about two inches of arc; at thirty inches radius it will only produce two-thirds of a second error. This may seem a small advantage, but the nearer we approach to perfection the more difficult it is to obtain any given increment.

It does not take much coal to increase the speed of a locomotive from ten to eleven miles an hour, but it is very different if we want to increase it the same ten per cent. from, say, sixty to sixty-six.

Another fact that has been brought to light by the experiments of the last few years is that atmospheric disturbance, the *béte noir* of the astronomer, has not so much effect on most of these photographic results as in the case of visual observations.

In the number of the *Observatory* published in December, 1889, Dr. Gill makes the following remarks in a note accompanying a specimen photograph which he sent over: "The picture is sent in corroboration of a fact I have suspected for some time, viz., that for stellar photographs, after a certain period of exposure, it is quite immaterial whether the atmospheric definition is good or bad, the photographic images of stars will be equally sharp in either case. That good measurable pictures can be taken on nights when refined eye observations of any value are impossible is a very remarkable fact, and one that *à priori* would probably be deemed unlikely. The explanation appears to be that the discs on the developed film which represents stars are very much larger than the minute circle formed by the converging cone of rays from the object-glass at its intersection with the plane of the film. These discs are produced by so-called photographic irradiation; in other words, by chemical action set up in the film, having origin in the cental point of light, and extending gradually and symmetrically over a wider radius from that centre. This being so, whenever the radius of the disc becomes greater than the radius of extreme oscillation of the optical image from a mean point, the resultant photographic action produced by the rapidly moving point of light becomes identical with the effect produced by a similar steady point of light occupying the same mean position."

Again, in the case of some of the spectroscopic methods of observation, more particularly when a slit is used, this peculiarity of the photographic method is perhaps still more apparent.

On this subject Dr. Gill, in a lecture delivered in this theatre just three years ago, says, "On account of irregularities in atmospheric refraction, the image of a star in the telescope is rarely tranquil, sometimes it shines brightly in the centre of the slit, sometimes barely in the slit at all, and the eye becomes puzzled and confused. But the photographic eye is not in the least disturbed; when the star image is in the slit the plate goes on recording what it sees, and when the star is not in the slit the plate does nothing, and it is of no consequence whatever how rapidly these alternate appearances and disappearances recur. The only difference is that, when the star is steady and the star's image therefore always in the slit, the exposure takes less time than when the star is unsteady. That is one reason why the Potsdam results, in the determination of stellar motion in the line of sight, are so accurate. And there are many other reasons besides, into which I cannot now enter. What, however, it is important to note is this, that we have here a method which is to a great extent independent of the atmospheric disturbances which in all other departments of astronomical observation have imposed a limit to their precision."

Those who are familiar with the use of large telescopes, know only too well that the larger the aperture the fewer are the opportunities on which it can be used with advantage, and the question has often been discussed as to whether the useful light of aperture has not already been reached, except in cases when it may be possible to transport the instrument to Arequipa or some such favoured locality. No doubt, large instruments so placed ought to be, and are, capable of doing much more and better work than if placed in a less favoured spot, say in the neighbourhood of a town; but experience had shown that other influences often arise which militate against the possibility of taking full advantage out of the improved locality. The conditions of life in some such isolated stations are not the pleasantest, and, though human nature may put up with inconveniences and unpleasantness as a temporary arrangement for the sake of science, yet as a permanency this state of things is not found compatible with the production of the best work, and in some cases it has been found necessary to send relays of workers to these isolated stations—a plan, no doubt, which meets to some extent this difficulty, but is evidently open to other objections.

If, however, as it appears, that the new photographic system is to a great extent indepedent of atmospheric disturbance, it ought to be possible not only to use, and use with efficiency, large instruments in situations within measurable distance of the haunts of civilisation (a great gain in itself), but it will also be possible to use with advantage, even in such accessible positions, instruments of far greater power than have ever yet been built, and of whose practical value there have been well founded doubts so long as the old system of eye observations was the only one available.

When this fact forces itself upon the attention of the scientific world, as it must do before long, and that the necessity of adding to the power of our telescopes becomes apparent, there is little doubt but that the means will be found to satisfy the necessity; but, as the magnitude of these instruments becomes greater, the importance of studying beforehand the necessary conditions to fulfil and the mistakes to be avoided becomes all the greater, and therefore I have thought it may not be amiss to bring under your notice a few suggestions as to the possibility of obtaining increased optical power in our telescopes.

Before we discuss the conditions to be fulfilled in the case of the mounting of more powerful telescopes, perhaps it would be well to get a clear idea of what is meant by the power of a telescope as distinct from *magnifying* power. You are aware that most of the work done with our very large refractors is done with magnifying powers which are equally usable with instruments of half the aperture or less, but it must not be assumed that the power of the instrument (used in its broad sense, *i.e.*, its capability of distinctly viewing minute objects, or the details of such), is then only the same as that of the smaller instrument used with the same magnifying power. On the contrary, Jupiter, or Saturn, viewed with a power of 600, with twenty-eight inches aperture, is a very different object to what it is when viewed with the same magnifying power and an aperture of, say, eight or ten inches. This is not due to extra brilliancy from the larger amount of light collected by the bigger object-glass, for even in the case of observing the moon say, when it is necessary to use tinted screens to moderate the brilliancy, this superiority of the larger aperture is just as evident; but it may be explained in this way:—

In a lecture by Dr. Common, delivered in this theatre in May 1890, he gave a very neat explanation of the fact that a certain amount of magnification of image is required in order to see a certain amount of detail in that image. He showed that the sensation by which the brain is excited is carried from the retina by an enormous number of fine nerves, which are excited by small bodies called technically "rods and cones," and that each of these produce one distinct sensation as relating to the particular part of the image which falls on that particular part of the retina; the image, therefore, as presented to the brain is a kind of mosaic, and it is evident that the larger the image that falls on the retina the finer will the mosaic be in proportion to the details of the image, and therefore the better will the details be appreciated.

A similar explanation may be given of the different character of the image given by large-aperture telescopes and small. The image of a star, as given by a telescope objective is not exactly a point; it is, owing to certain physical reasons which it would be impossible to enter into in this lecture, in the form of a small disc of light which, if the object is of a sufficient brilliancy, is surrounded by diffraction rings. The diameter of this spurious disc depends amongst other conditions on the diameter of the object-glass; the larger the diameter of the object-glass the smaller the diameter of the disc; in other words, the discs, as seen in large object-glasses, are smaller than those seen in smaller object-glasses; or, putting it another way, if a certain size of object-glass be found to give a spurious disc of a certain size, *reducing* the aperture of the object-glass will *increase* the size of the spurious disc.

Every object may be considered to be made up of an infinity of points, of every one of which the object-glass gives an image in the form of a little disc. It is evident that the image that is made up of the larger spurious discs will not be as fine or as delicate, or show as much detail, as that made up with the smaller discs. The image of such an object as

Jupiter or Saturn as seen in the small telescope, compared with that as seen in the large telescope, will be as a drawing made in the first case with a coarse crayon or stump, to that made in the second case with a finely pointed lead pencil; or we may compare the first to a very coarse mezzotint engraving, while the second may be compared to the very finest work that can possibly be turned out.

This is the reason that the larger aperture telescope, even when used with powers corresponding only to those which can be effectively used with a smaller instrument, show objects with a clearness and distinctness that it is impossible to obtain in the smaller instrument, no matter how perfect the workmanship may be.

And now we come to the question of the probabilities of our being able to increase to any great extent the powers of our telescopes, and with this also naturally arises a question which, judging by the number of queries that reach me about it, seems highly interesting to the general astronomical world, "Will the great telescopes of the future be refractors or reflectors?"

Mr. Alvan Clark, whose large refractors in the United States testify to his great skill, declares emphatically for refractors, perhaps naturally so; but his reasons do not appear altogether convincing, and there are others well qualified to judge who give an opposite opinion. It is a question which only the future can decide. Of course, if we all make up our minds that the coming telescope is to be a refractor, it will be so, for all our energies will be devoted to its development; but the same might be said of the reflector, which, I believe, is capable of being greatly improved if attention were directed to it.

There is one reason that I believe has been overlooked, which explains to some extent why the reflector has not been developed of late years as has the refractor. This matter is not of a scientific, but purely of an economic, character, and I should perhaps ask pardon for introducing it into a scientific lecture; still, it is necessary for explanatory purposes.

Reflectors are, unfortunate for themselves, much less costly than refractors, and I belive that this has much to do with their comparatively neglected condition at present; this may seem curious, but it is easily explained. An object-glass of eighteen inches is worth, say, 1000*l.*; a mirror of eighteen inches is worth, say, 100*l.* No one who wanted to have good mounting would object to pay 1000*l.* to mount the 1000*l.* object-glass, but there are many who would object to pay the same 1000*l.* to mount the 100*l.* mirror; and yet why should it not be equally well mounted? and, if not so, how can it be expected to give as good results as the refractor? As a matter of fact, there are greater difficulties in mounting a reflector than a refractor, and these greater difficulties mean increased cost for an equally good mounting. I believe this simple economic question has much to answer for in bringing the reflector into disrepute with many. It has often been remarked that the reflectors that have been best worked have been constructed and worked by amateurs, the reason, to a great extent, being that this economic point does not then enter so largely into the question.

There are great difficulties in the mounting of reflectors, more especially when required for use as a photographic telescope, and these difficulties have never yet been satisfactorily solved; but I believe there is nothing unsolvable in them, and that it only wants attention to be drawn to them to ensure a solution.

Only within the last month Dr. Johnstone Stoney has devised a most ingenious arrangement for supporting the great mirrors of reflecting telescopes on an air support, graduating the pressure according to the angle of inclination of the telescope by an automatic contrivance. Possibly this apparatus in its present form may be capable of improvement; but it is at least a step, and a very important step, in the direction of solving one of the most troublesome and difficult problems to be met with in the attempt to obtain a really satisfactory mounting for reflecting telescopes.

That the reflecting telescope is capable of doing excellent work in the hands of those who take sufficient care and trouble with the adjustment and in the working is sufficiently evidenced in the results obtained by Draper, De la Rue, Common, and Roberts; but the fact is, that to obtain good results with the reflector in its present imperfect state of development more labour and patience is required than most observers care to bestow on the work; and there is much to be said in excuse for this, for if an astronomer's time be taken up with the necessary attention to the details of his instrument, he will not be able to pay that undivided attention otherwise possible, and at all times desirable, for his more legitimate work in the obtaining of results with that instrument. The fact that the reflector brings all rays of light to a common focus, irrespective of their wave-lengths, while the refractor is at best but a compromise, tells strongly in favour of the ultimate success of the reflector over its rival.

True, it may be said that the experiments in glass-making that have been carried on for some years at the Jena Glass-manufactory may yet eventuate in producing qualities of glass which will remove this reproach from the refractor, and enable us to perfectly balance the chromatic error, and at the same time be of a sufficiently permanent character to justify its use in the case of large objectives. No one would be foolish enough to attempt to make a large objective of any material which was not known from previous experience to be capable of preserving its perfection of surface for at least twenty or twenty-five years.

Unfortunately there is no test of permanency except the lapse of years; even if, therefore, some such glass were in existence at the present time, no maker who had any desire that his name should live after him in his work would care to use this untried material until actual experience proved its character for permanence. This, and the fact that it has not yet been found possible to produce perfect pieces of this Jena glass of one-tenth of the weight of those already produced of the more ordinary varieties of optical glass, cuts off any hope we might otherwise have of being able for the present to produce large objectives with perfect correction for the chromatic aberration; and, so long as this is the case, the reflector which treats rays of all refrangibilities alike has in this respect the advantage.

When we consider that the largest optical discs ever yet produced, and which were rightly considered a perfect triumph of art, are only forty inches in diameter, and that, on the other hand, Lord Rosse's reflector of seventy-two inches diameter is now half a century old, it is tolerably evident that for the present, at least, we must look to reflectors if we want to increase to any large extent the power of our telescopes.

With this view, and understanding that it is likely an attempt will be made to build an eight or ten-foot reflector for the great exhibition to be held in Paris in 1900, it may be interesting to consider the conditions desirable to be fulfilled for such an instrument, and the most promising construction to satisfy those conditions. If a monster telescope, such as is to be mounted only in such a manner as will satisfy the ordinary conditions of star-gazing, I fear the results will be disappointing; but let it be mounted in such a manner as to render it usable for the more delicate and refined work of the modern astronomy, and a grand and productive field of work is open to it.

But the problem of mounting an enormous instrument such as this, whose weight would probably amount to from fifty to 100 tons, so perfectly poised and so accurately driven by clockwork as never to vary from its true position by a quantity greater than the apparent motion of a star in one-twentieth of a second of time, is sufficiently difficult to justify almost a doubt of its possibility, and this difficulty has been appreciated by others; for Dr. Common, who, as the maker of the largest equatorially mounted reflector ever completed, must be considered as the first authority, proposed some short time since to resort to the alt-azimuth form of mounting, with which it would, of course, be impossible to satisfy the above condition.

Dr. Common himself has made a splendid advance in adopting the system of flotation of the polar axis; this principle of flotation appears to me to be capable of further development. It is perfectly possible to make a tube for a Newtonian reflecting telescope (which is necessarily closed at the lower end) of such a weight, and with its weight so distributed that it will not only float in water submerged to a certain point (preferably near the upper end), but will be in a state of equilibrium when placed at any or in every position down to a certain angle, which angle depends on the exact outside form of the tube. For instance, if *AB* be a tube closed at *B* and perfectly symmetrical round the axis *AB*, and the total weight of the tube be equal to the weight of water which is displaced when the tube is sunk to *C*, the weight of the different sections along the axis *A B* can be so distributed that the tube will equally well remain in any other position, except it be so far turned over that the cylindrical part of the tube is lifted out of the water at one end and dipped at the other [diagrams were shown.]

By making the spherical part of about the proportions of the figure, the tube can be depressed to within 25° of the horizon, and still remain in perfect equilibrium.

Now, suppose the tube to have a pair of trunnions attached at the water line, and these carried on a polar axis of, say, the English type, we have an equatorially mounted telescope of any size, without any weight whatever on the bearings of the Dec axis, or, the tube may be lightened by an amount nearly equal to the weight of the polar axis, and there will then be practically no weight whatever on the bearings of that axis. So here we have a case of, say, an eighty-ton telescope mounted and carried by an equatorial, but without throwing any weight whatever on that equatorial; and the force necessary to drive the instru-

ment is independent of the weight of the telescope, and dependent only on the friction necessary to be overcome in carrying the tube at an exceedingly slow rate through the water.

Let us inquire into any possible disadvantages that may be urged against this form of mounting.

1. That the temperature of the water will often be different from that of the air, and consequently that there will be a detrimental mixture, at the mouth of the tube, of air from inside the tube, which will partake of the temperature of the water, with the outside air. This I would propose to avoid by making the tube double, with a space of some three inches between inside and outside tubes, hermetically closed except at the lower end, where there would be apertures in the inside envelope. The space between the two tubes would be connected through the trunnions with an air pump, worked by a gas or other motor, which would continually exhaust the air from between the two tubes, and thus cause a current of the outside air to pass continually down the tube and back to the pump by the space between the two tubes. This would keep the temperature of the inside tube and the air in the tube constant with that of the outside air.

2. The limited range of the equatorial. I have stated that the instrument would be in perfect balance down to 25° from the horizon. If desired, though no longer perfectly balanced, it can be used lower by employing a chain, or wire rope, connected between the lower end of the tube and the upper end of the polar axis, and the amount which the instrument would be out of balance, between 25° and 20°, would be very trifling.

Again, it will not be convenient to use the instrument within some 15° of the pole. It could be planned to go somewhat closer, but, when it is considered that nine-tenths of the work required to be done can be commanded by this instrument, it is clearly better to design it to do that nine-tenths well than to strain it into doing another 5°, that would only be useful on very rare occasions.

3. It may be urged that the friction of the water will prevent the rapid setting of the instrument. In a telescope of this size all the motions would be effected by motors of some description, guided by the observer from a commutator board at the eye end, and there would be no difficulty in setting the telescope quite as quickly as could be expected, considering its great size.

4. It may be objected that currents will be set up in the water by the moving of the telescope, which currents will affect the steadiness. No doubt this will be the case to some extent, but these will soon subside, and the motion necessary for following the stars will be so slow that no perceptible effect of this kind will be felt from it.

As to convenience in getting at the eye end, there need be no difficulty whatever in this form. As the eyepiece is only about fifteen feet from the centre of motion, the movement of the observer is never more than three feet per hour. By means of a platform, such as that shown running on rails and quite independent of the instrument, the eye end is readily accessible at all times. To overcome the rotation of the tube as the instrument moves in right ascension, I would pierce the tube for eyepieces every 30° round its circumference, and mount the flat mirror and cell in a collar, so as to enable it to be readily rotated through intervals of 30°. By these means, the image of the celestial object to be observed could be sent through either or any of the perforations of the tube, and the observer always observe in the direction most convenient to himself.

There are various difficulties about this construction which may naturally suggest themselves, but there are none, I believe, which cannot be overcome.

This is hardly the place to discuss details; but, if there be any here who are sufficiently interested in this new form of equatorial to desire further information, I would refer them to an article in the present month's issue of *Knowledge* which deals with most of the difficulties.

Putting aside now the question of reflectors *versus* refractors, there are some directions, applicable equally to reflectors and refractors, in which it is evidently possible to improve our designs for large equatorial instruments. It is not the first time that I have urged similar developments, but the advantages of what I recommended were not so apparent then as they are now in the present advanced state of astronomical research.

It may be remembered that, when I lectured here in the year 1886, I strongly urged the desirability of employing some form of motive power for carrying out the various motions required in manipulating the large equatorials, domes, &c., and exhibited a model design I had made for the Lick Observatory, which illustrated the manner in which these various motors could be controlled by the observer, as well as the then newly devised lifting floor arrangement. The latter, that is the lifting floor, was, as you are aware, adopted by the trustees of the Lick Observatory, and I suppose we may assume that it was considered a success, as it has been copied in the case of the two large observatories built since in the United States, viz., the Washington and Chicago Observatories. The Lick trustees, however, rejected the proposals for the employment of motors for the equatorial movements and dome. That experience gained since the construction of this telescope has confirmed the correctness of my views as respects the desirability of adopting this system is evident, as, in their latest and most perfect instrument, that of the Yerkes equatorial at Chicago, practically all the suggested improvements in that model exhibited before you in 1886 have been adopted, and I hope will contribute in no small degree to the quantity as well as the quality of the output of work we may expect from that splendid instrument; but, to show that this by no means represents all that can be done in this direction, I have here a rough and unfinished model of an observatory in which the principle is carried still further.

It will be observed that in the Lick design the astronomer is relieved of all physical exertion, but still his attention is required during all the process of setting of the instrument. In our latest design we are able to relieve the astronomer of even the mental strain in this way. In some of our modern equatorials the setting of the circles can be placed (by a new arrangement) at the eye end of the telescope. Suppose this to be so arranged in the large telescope, and that an arrangement be added something similar in principle to the steam steering gear of our large steamers, with which every one is now familiar. In this machine the construction is such that when a small light wheel is turned any quantity to port or starboard the motors are automatically set to work and force the helm over in the right direction, and do not stop until the position of the helm itself exactly corresponds to that of the light guiding wheel. A very simple arrangement of electrical contacts suffices to effect this in the case of the telescope, and the working of the instrument is effected thus:—

The astronomer decided what AR and what DEC he desires the telescope to be set at, he walks over to the eye end of the telescope, which as will be seen further, can only be at a convenient height from the floor, and sets a pair of pointers at the end eye to the particular readings he wishes, and then presses a button to start the motors, and "awaits developments."

Without any more attention from the astronomer, the instrument now sets itself in exactly the position he requires, the motors continuing to revolve the telescope on its axes till that position is attained, and then they stop. Meanwhile, as certain contacts are arranged at the upper end of the tube connected with the motor which drives the dome, and at the lower end with motors which elevate and depress the floor, the dome revolves if necessary, and keeps the opening opposite the upper end of the telescope, while the floor rises and falls as may be necessary, always keeping at a convenient distance below the eye end; and so, as I said, without any attention or physical or mental strain on the part of the observer, he finds after a few minutes his telescope sets correctly in AR and Decn—the dome opening is opposite the object-glass and the floor at a height most convenient for observation.

The idea may seem almost Utopian, but there are no particular difficulties in carrying it out, nor would it add sensible to the cost of a large instrument.

He concluded as follows: "If I have succeeded even very imperfectly in rendering a necessarily technical, and therefore somewhat dry, subject sufficiently interesting to have enabled you to follow me, you will have no difficulty in seeing that the principal ideas I desired to convey may be summed up shortly in this way:—

That, while on the one hand, the adoption of new methods for prosecuting astronomical researches has created a set of conditions under which it is possible to use, and use with advantage, instruments of greater optical power than hitherto, yet, on the other hand, the mechanical arrangements for mounting these instruments must be of a much higher standard than has been necessary for the older methods; in fact, they must be mounted as instruments of precision in the highest sense of the term, and while the mounting of instruments even larger than we have at present suitable to the older conditions would not present any serious engineering difficulties, the problem of mounting them as instruments of precision is one of considerable magnitude, a fact which is well recognised by those who have studied the subject.

The time has gone by when with every few inches increase of aperture some sensational discovery is expected.

The astronomer of the future will not be satisfied with star-gazing instruments. The experiments of the last few years show that there is no royal road to great astronomical discoveries, but that patient, honest,

and self-recording work is necessary to enable us to add (as our ambition s) course after course to the great edifice of astronomical truth.

But the ever-advancing work of the astronomer demands an ever-increasing perfection of his instruments, and the records of the past show that few of these improvements are to be credited either entirely to the astronomer, be he ever so practical, or to the instrument-maker, however ingenious, but to both working harmoniously together, the astronomer finding out the weak points of existing instruments, and the instrument-maker continually devising new contrivances to meet the difficulties of the astronomer.

I myself would like to take this opportunity of saying that whatever measure of success I may have had in my work is due in no small degree to the helpful kindness I have invariably received from those astronomers with whom I have been in communication.

As it has been in the past, so, let us hope, it will be in the future, for in this harmonious working together of those who design and those who work the instruments lies our strongest hope of the future development of the astronomical telescope.

Our Editorial Table.

Catalogues Received.

J. R. Gotz, 150, Shaftesbury-avenue, W.C. This, the optical section of Mr. Gotz's catalogue, is devoted to descriptions and prices of Suter's Antiplanat lenses, also to the Zeiss Anastigmats, manufactured by him under special licence. Much useful information as to the properties of lenses is included in the catalogue.

Sands, Hunter, & Co., 20, Cranbourn-street, Leicester-square, W.C. Both the ordinary catalogue and that of second-hand apparatus of this firm are to hand, the latter containing particulars of many bargains in lenses, cameras, &c.

La Photographie et le Droit.

Par A. Bigeon. Paris: Charles Mendel, 118, Rue d'Assas.

This is a valuable book, and it is as exhaustive as it is valuable. In an introductory chapter the author summarises the position of French legislation with regard to photographs, and in succeeding sections discusses whether photography is to be regarded as an art or an industry, to whom belongs the negative, exhibition of photographs without the permission of sitters, the ethics of "detective" photography, the law as to photographing in the neighbourhood of fortifications, the production and sale of obscene photographs, &c., giving in these and other cases the French law applicable to them. A third section of the book is devoted to a summary of the law in different countries with regard to the protection of photographic productions, and in the appendix reference is made to the Berne Convention, &c.

Herr Wilhelm Knapp, of Halle a. S. has issued three further volumes in the *Encyklopädie der Photographie* which he has in course of publication. No. 6, *Die Photogalvanographie*, by Ottomar Volkmar, which gives a description of Pretsch's process of photo-engraving and other cognate processes; No. 7, *Die Misserfolge in der Photographie*, by H. Müller, a terse handbook of photographic practice; and No. 8, *Die Mikrophotographie*, by Dr. Neuhass, a short guide to photo-micrography for reproduction and projection purposes.

News and Notes.

Mr. Horace Pike, Photographer, of Lichfield, has just had the honour of a sitting from His Royal Highness the Prince of Wales.

The Affiliation of Photographic Societies' Meeting of Delegates, Wednesday, June 13, at half-past seven p.m., at 50, Great Russell-street.

Mr. W. H. Redshaw, Bourne, Lincolnshire, sends us his new Catalogue. It contains several new things in accessories and backgrounds, and also several illustrations.

Mr. J. Epstein, of 33, Broad-street, Bristol, has been awarded a silver medal for his show of mouldings and mounts at the National Trades and Industrial Exhibition, Bingley Hall, Birmingham.

South London Photographic and Optical Stores.—Messrs. Banks & Greaves, of Clapham-road, write: "We have opened these premises for the manufacture and sale of photographic apparatus, lanterns, and accessories."

Photographic Society of Great Britain.—Ordinary Meeting, June 12, at eight p.m. *The Action of Light on Bacteria and Fungi*, by Professor H. Marshall Ward, D.Sc., F.R.S. *The Development of Printing-out Papers*, by Mr. W. J. Wilson, F.C.S.

We have received from W. H. Midwinter, Bristol, some interesting prints on P.O.P. which have been in his specimen case outside the front door, and exposed to all weathers, for six months. They are very fine, and in an excellent state of preservation. In Mr. Midwinter's opinion albumenised paper would have gone quite yellow with such treatment.

With the last number of the Journal and Transactions of the Photographic Society of Great Britain there is issued, as a supplement, a photogravure, entitled *Waiting for the Tide*, a view of craft below bridge. It is from a negative by Mr. H. Wilmer, and the prints were pulled from the plate etched by that gentleman in the course of his demonstration of photogravure before the Photographic Society of Great Britain on April 24.

Richmond on Sundays.—A correspondent of a daily paper writes: "Might I suggest that that the Richmond Corporation, which has done so much for our beautiful suburb, should turn its attention to the nuisance caused on Sundays, and for aught I know on other days, by the numerous itinerant photographers who infest the the towing path, and by their importunate solicitations detract greatly from the pleasures of one of our prettiest walks by the Thames-side near town?"

Excursion of Dundee and East of Scotland Photographic Society.—The Dundee and East of Scotland Amateur Photographic Association held the first excursion of the season lately, the place visited being Dalmally and Loch Awe. The picturesque features of the scenery around Dalmally were transferred to the dry plates of the members, who expressed themselves greatly delighted with the number and variety of the "bits" suitable for photographing. The party then proceeded to Loch Awe, photographing all along the way, while many availed themselves of the boats of the hotel to cross to the island and photograph the picturesque ruins of Kilchurn Castle. At four o'clock the members and friends, to the number of fifty, sat down to dinner, purveyed by Mr. Fraser. Before leaving, the whole party was photographed by Mr. David Ireland. The weather was delightful, and the excursion was heartily enjoyed by all present. The party reached Dundee shortly after ten o'clock. Among the places photographed were—Parish Church, Dalmally; various bits on the Orchy, farm of Croit-an-Tuim, Dalmally Hotel; Stronmildran, River Strae and Bridge, bits in Glen Strae, Ben Cruachan, Kilchurn, Loch Awe Hotel, &c.

"Such are our Teachers (?)"—We want, with all courtesy, says *Photographic Scraps*, to give voice a little grumble and a note of advice to those whom the cap may fit. Whilst the growth in the number of photographic societies is, to some extent, a good sign, and has a good influence, it has also another effect, and that is the difficulty of finding subjects for discussion, or competent workers to undertake to read papers or give demonstrations. Too often the evenings are productive of little interest or instruction, and we need not wonder that so many suburban and country societies drop year by year into oblivion. Such must, we think, be the fate of the Society that owns the writer of the following letter amongst its members, if this gentleman is at all a fair example of the lecturers: "I should be obliged if you will forward me a sample print on matt P.O.P., as I am down to read a paper to-morrow night on the subject before the ——— Club, so should be glad if you would send off the print so as I get it here by to-morrow afternoon, as I have not had time to prepare a sample as I wished." On another occasion a would-be lecturer wrote: "Please send me a free set of samples by return, with copy of your pamphlet, and as full particulars as you possibly can, as I have been so busy that I could not prepare my paper, and want to make my remarks as full as possible." Thank goodness, these are, we feel satisfied, exceptional cases, but that such cases should exist at all is a disgrace to photography, and we hope we shall never meet with another.

At the Borough of Derby Corporation Art Gallery there will be an Exhibition of Photographs opening on June 25. The following medals will be awarded:—A (Champion Class), two gold medals, one for Portraits, Groups, or *Genre* Pictures; one for Landscapes, Architecture, or any subject not coming under the above classification.—For any single picture or set of pictures which during the years 1892, 1893, or 1894 has been medalled at any public exhibition. Where a set has gained a prize, the entire set must be sent in. The names of the places where the awards have been obtained and the dates must appear on the pictures or frames. (Lantern slides are not available.) B, Landscape or Seascape, series of, not less than four.—Professional Work: one silver medal, one bronze medal; Amateur Work: one silver medal, one bronze medal. C, *Genre* or Figure Pictures, or series of.—Professional Work: one silver medal, one bronze medal; Amateur Work: one silver medal, one bronze medal. D, Architecture, Interior or Exterior, series of, not less than four.—One silver medal, one bronze medal. E, Portrait, or series of, not more than six frames.—one silver medal, one bronze medal. F, Instantaneous Pictures, or series of, not less than four.—One silver medal, one bronze medal. Classes D, E, and F are open to both professionals and amateurs. Special notice to amateur members of the Derby Photographic Society: a silver medal (given by Mr. R. Keene, Vice-President of the Society) will be awarded for the best series of prints, not less than four, produced by an amateur member of the Society and shown at this Exhibition. Further particulars may be had of Mr. William Crowther, Curator, Art Gallery, Derby.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
11	Norfolk and Norwich	
11	North Middlesex	*Architectural and General Interior Photography.* J. H. Avery.
12	Birmingham Photo. Society	
12	Great Britain	*The Action of Light on Bacteria and Fungi.* Professor H Marshall Ward, D.Sc., F.R.S.—*The Development of Printing-out Papers.* W. J. Wilson, F.C.S.
12	Hackney	Burchett's Colour Screens. Mr. Dallmeyer.
12	Manchester Amateur	
12	Paisley	
12	Stockton	
12	West London	
13	Croydon Camera Club	Tenth Excursion, to Cambridge. Leaves South Croydon at 8.14; East Croydon, 8.18.
13	Leytonstone	
13	Munster	
13	Photographic Club	Members' Open Night.
13	Southport	
13	Stockport	
14	Birkenhead Photo. Asso.	
14	Glossop Dale	
14	Hull	
14	London and Provincial	
14	Manchester Photo. Society	
14	Oldham	Exc.: Hoghton for Hoghton Towers. Leader, T. S. Walmsley.
15	Cardiff	
15	Croydon Microscopical	
15	Holborn	
15	Leamington	
15	Maidstone	
15	North Kent	
16	Ashton-under-Lyne	Exc. to Wharncliffe Craggs. Leader, Joseph Hutchinson.
16	Hackney	Excursion to Broxbourne. Leader, E. Farmer.
16	Hull	
16	Leytonstone	Excursion: Along the Roding. Leader, F. W. Wates. Leaves Fenchurch-street (G.E.R.) at 2.43 p.m.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 31, Mr. C. H. Oakden in the chair.

Mr. E. MILNER read a paper on *Outdoor Photography* [see page 359]. A short discussion followed, and Mr. Milner received a vote of thanks.

PHOTOGRAPHIC CLUB.

MAY 30, Mr. F. A. Bridge in the chair.

NEW HAND CAMERAS.

Mr. H. J. REDFERN, for Messrs. Watson & Sons, showed their Vanneck and Alpha cameras in various forms and sizes. The Vanneck hand camera takes twelve plates or films in sheaths, which are changed by turning a milled head outside the camera. This raises them in a flexible bag, where they are taken between the fingers and removed from the back to the front. The chief feature of this camera is the finder, which is formed by the same lens which takes the picture, and permits of focussing up to the moment of exposure. The Alpha camera is of polished mahogany, in the form of a box, and contains, when closed, the finder, lens, and shutter, the two latter remaining in same position as in use. The front of the box falls down to form a base, and the front of the camera may be drawn out and fixed in any position desired by means of a clamping nut. Focussing may be done to scale or by means of a focussing glass, and dark slides, changing box, or roll-holder may be used with this instrument.

Mr. P. HARGREAVES showed Messrs. Houghton's Filmo camera, a camera made specially for films, of which it takes twenty-four in sheaths, and which are automatically changed after exposure. The camera is neatly covered with leather, and has all the usual accessories.

Mr. J. A. SINCLAIR showed Fitch's film hand camera. The films are held in very light revolving frames, which travel forward to position for exposing by simply turning a milled head at the side of the camera. It is constructed to hold two dozen films, and a numbering disc registers each exposure.

Major LYASGHT explained the principles and mechanism of his patent camera. The most important feature is the full-view focussing finder, the image of which is formed by the lens. The finder is fitted with metal hoods to shield it from extraneous light, and the lever which lifts these hoods to a suitable position for looking in the slit at top also places a mirror at the back of the lens, at an angle of 45°. After focussing, the finder is closed, and the focal-plane shutter released. The camera is intended to be used with dark slides or changing box as desired.

Mr. G. H. JUDD described the principal features of the Dallmeyer hand camera. This is fitted with a Dallmeyer rapid rectilinear lens of five-and-a-quarter focus, working at *f*-8, and snap-shot, roller-blind shutter, and is constructed of mahogany, leather covered. It has rising, falling, and cross fronts for architectural work, and is fitted with a light and novel form of dark slide, the shutters of which are made of thin corrugated sheet steel, and, by means of a small lever, open inside the camera. Six of these slides occupy a space of two-and-three-eighths of an inch only.

Mr. G. HARE showed his hand camera, fitted with the same slides as Dallmeyer's. In the camera the rising and cross front is dispensed with.

Mr. J. R. GOTZ explained his Paragon hand camera, an automatic changer holding twelve plates. The camera is made to focus, and has a Suter lens and a Lucerna finder.

Mr. A. L. ADAMS described the Vesta pocket camera, which, by drawing the lens downwards and forward, is instantly ready for use. It has reversible finder, Wray's lens in rackwork focussing jacket with distances accurately marked, Hill & Adams' patent pneumatic regulation to shutter permitting of variations in speed from one to one-hundredth of a second, and is fitted with a changing box, one inch thick, which holds twelve plates or twenty-four films. It is also supplied with light-tight dark slides when required. Mr. Adams also showed a model of the Leda hand camera, which was not yet ready for the market. This camera is constructed to carry any number of cut films, from one to 100, without sheaths or backing of any kind, the films being placed in the camera like a pack of cards, and changed by pulling a button on the bottom of the camera.

Croydon Camera Club.—The subject on Wednesday, May 30, was *Quick-work Photography*, a debate, opened by the PRESIDENT, who dwelt upon the importance to beginners in knowing of all the many existing aids to quick-work photography, and also being alive to the uses and abuses of the various appliances and expedients. An animated discussion, in which Messrs. J. Pearce, G. R. White, Packman, J. Smith, Isaac, Waller, Corden, Holland, Noaks, and others took part, was closely followed by a large gathering of members. Several speakers showed prints or diagrams in illustration of their arguments. A circular received from the *Graphic*, inviting amateur photographers to contribute to the illustration of the journal, presumably without charge—all for glory—was the subject of unfavourable comment; members of the Club, whether amateur or otherwise, were urged not to lend themselves to a scheme for obtaining something for nothing. The excursion to Cambridge is fixed for June 13, when it is expected that special cheap tickets, at 5*s.* 4*d.* return, will be obtainable. Members or friends should at ance notify Mr. E. Fenton Frost, 45, Brighton-road, of their intention, if they want to participate in a delightful day spent in this glorious University city.

Hackney Photographic Society.—May 29, Dr. Gerard Smith in the chair.—The HON. SECRETARY announced that the Morley Hall had been booked for November 20, 21, and 22 next, the date of the Society's forthcoming Annual Exhibition. Members were called upon to make the Exhibition a success. Mr. Roofe gave second notice of excursion to Enfield on June 2, and Mr. Dean second notice of excursion to Loughton on June 6. Work was shown by Messrs. R. Beckett, Roofe, Fort, Grant, and Gerard Smith. Mr. J. J. Westcott was nominated for membership. Mr. W. H. BARNES then gave a paper on *Isochromatic Photography*, and showed examples of work done on Edwards's isochromatic plates. He said that it was somewhat surprising that isochromatic plates were not more generally used, considering their manifest advantages over ordinary plates. Doubtless, the objections against their use arose from misapprehension. Many recognise their use in copying oil paintings, but it did not seem to occur to them that these plates might be almost equally useful in landscape work, considering that they had greater sensitiveness to yellow and light green. Some objected to them because they thought that the use of the yellow screen, with consequent increase of exposure, was absolutely necessary when using isochromatic plates for landscape work. This was a mistake, the screen was not necessary; in fact, in most cases in this kind of work its use was harmful. Again, some thought that these plates would not keep well. This was incorrect; for, if properly prepared, isochromatic plates would keep as well as ordinary plates. He (Mr. Barnes) had used isochromatic plates four years old, and found them to be as good as freshly made ones. Passing to the historical portion of the subject, Mr. Barnes said that the insensitiveness of silver bromide to the yellow rays of the spectrum had long been recognised. In 1876, Colonel Waterhouse suggested the use of eosine as a sensitiser for the yellow; but this was only applied to collodion bromide emulsion, and the present system of colour sensitising was due to Tailfer, who, in or about 1883, discovered and patented the use of eosine in conjunction with ammonia. The plates might be made isochromatic in two ways, either by bathing ordinary plates in a solution of eosine and ammonia, or, preferably, by adding the colour sensitisers to the emulsion before coating. The bath process was not to be recommended, because, ammonia remaining present in the film, the plates must be used at once, or they would deteriorate. Tailfer's patent was purchased by Mr. B. J. Edwards, and it was to him that the credit of the present position of isochromatic photography was due. Mr. Barnes said that for copying oil paintings these plates were absolutely necessary, and showed examples which clearly proved their superiority over ordinary plates, especially in cases where the paintings had become cracked and yellow with age. With these the yellow screen had been used. He also showed photographs of flowers taken on ordinary and isochromatic plates respectively, the latter with and without the screen. These examples showed the screen to be superfluous, its use rendering the yellow too light. Continuing, and passing on to landscape work, Mr. Barnes said that here isochromatic plates were very useful; the yellows and light greens of foliage were more correctly rendered, clouds could be obtained on the same plate, and the planes of distance were better preserved. The use of the yellow screen was here also usually unnecessary; but, in cases where the light was poor and the atmosphere hazy, the screen was useful in producing a more brilliant result. (Examples were shown proving this.) In portraiture, these plates gave a better colour rendering of clothing, hair, &c., and reduced the necessity of retouching. Mr. Barnes then showed Edwards's colour screens. These were made in three tints, increasing exposure by two, three and a half, and six times respectively. They are of optically worked glass, and are made to fit either in lens hood or behind the lens, in a flange screwed to back of camera front. Besides these, screens of yellow gelatine are made to fit in diaphragm slot. The colour of these latter is purer than in the glass

screens, the reason being, Mr. Barnes said, that it was impossible to obtain glass so pure in colour. Continuing, he said it was necessary, if a gelaline film screen be used, to see that it was perfectly flat, as, if at all wavy, the image would be thrown out of focus, like an example shown. For the same reason, it was necessary that a glass screen should be optically worked. Concerning the dark-room illuminant, Mr. Barnes said that ruby light was best—he used two thicknesses of ruby glass, but shielded the plate from this light as much as possible. No special developer was necessary for isochromatic plates; but, whatever is used, it must not be too strong, as with these plates density was very readily obtained. Speaking of developers in general, he said that a great mistake was frequently made in using too much sodium sulphite with a pyro-soda developer, and, as for pyro-ammonia, sulphite should not be used with this at all.

South London Photographic Society.—This Society had an excursion, on May 26, to Carshalton, under the leadership of Mr. J. T. French. This proved an enjoyable and pleasant outing, with an attendance of thirty-six.

Bath Photographic Society.—The second of the summer excursions took place on Saturday last, the 2nd inst., when the members visited the picturesque village of Englishcombe. The President led the party, and among the principal objects of interest photographed was the Norman church, its curious stone carvings, font, leper window, &c., the tithe barn and the thatched cottages, with charming winding roads in the immediate vicinity. The return drive to Bath was commenced at half-past five, and, the weather being fine, the outing proved in all respects satisfactory.

Liverpool Amateur Photographic Association.—An excursion of this Society took place on Saturday, May 26, when a large party journeyed to Miller's Dale, under the leadership of Mr. F. Anyon. The weather was showery, and much time was lost. About two miles from Buxton the party was met by a waggonette and proceeded to that place, where they had tea at Müller's Hotel. 120 plates were exposed and good work was done. The members returned to Liverpool about nine o'clock.

May 31, Mr. Alfred Tyrer (the President) occupying the chair. Mr. E. Lloyd Edwards, Bryn Oerog, near Llangollen, was elected a member. Mr. Birt Acres (Messrs. Elliott & Sons) gave a lecture and practical demonstration on *The Carbon Proccss*. After going into the history of the process for the past thirty years, he showed improvements made in the pigments and tissues used, and gave some very valuable hints in the working of the present tissure, which he fully illustrated by developing and transferring to the support both single and double transfer. He claimed for carbon prints absolute permanency, owing to the absence of chemical treatment in the development.

Longton and District Photographic Society.—A meeting of the above Society was held on Wednesday evening, May 30, for the purpose of forming a code of rules, and the election of officers, committee, &c. After the rules had been decided upon, the election of officers and committee was proceeded with. *President:* the Rev. W. J. Smith.—*Vice-Presidents:* Messrs. George Hawley and T. P. Hulse.—*Committee:* Messrs. Bott, W. W. Hulse, Mottershead, Prince, Platt, and Tindall.—*Hon. Treasurer:* Mr. S. Ashcroft.—*Hon. Secretary:* Mr. A. R. Miller, 45, Carlisle-street, Dresden, Longton.—*Hon. Assistant Secretary:* Mr. George Turner. It was decided to have monthly excursions to places of interest in the neighbourhood and to arrange for monthly meetings during the winter for mutual discussion and improvement.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,202.—"Improvements in the Production, by the aid of Photography, of Pictures or Representations in Colours, and in Means or Apparatus employed therein." G. T. Teasdale-Buckell.—*Dated May*, 1894.

No. 10,369.—"Improved Photometer for Photographic purposes." J. Barnes.—*Dated May*, 1894.

No. 10,374.—"Improvements in Photographers' Retouching Desks." J. W. Beaufort.—*Dated May*, 1894.

No. 10,461.—"Improvements in Magazine Cameras." S. D. Williams.—*Dated May*, 1894.

PATENTS COMPLETED.

Improvements in the Manufacture of Sensitive Plates and Films for Photographic Purposes.

No. 8956.—Charles Edwin Pettitt, 46, Fleet-street, Torquay, Devonshire. *April* 28, 1894.

My invention has reference to the manufacture of sensitive plates and films for photographic purposes, and its object is to prevent or diminish halation (local over-exposure), and solarisation (reversal of the image by over-exposure).

With this object I interpose between the sensitive emulsion and the glass plate, film, or other support, a substratum or coating containing a colouring matter, which, during the exposure in the camera, will entirely absorb or obstruct the actinic rays of light in their passage to and from the reflecting surface or surfaces of the glass plate or other support.

In carrying out my invention I coat the plate or film with a non-sensitive substratum or coating of gelatine, collodion, albumen, or other similar suitable vehicle which has been made non-actinic by the thorough incorporation therewith of non-actinic colouring matter. The vehicle preferably used for the purpose is gelatine of the same physical character as that employed in the preparation of the sensitive emulsion used on the plate or film. When the non-actinic, non-sensitive substratum has become thoroughly set and dry, I coat it with an ordinary emulsion of haloid salts of silver of any required sensitiveness.

The emulsion can, if thought desirable, be isolated from the substratum by applying to the substratum when dry a thin solution of gum arabic or albumen, which is allowed to dry before the emulsion is applied, but in practice I have not found this isolation necessary.

The colours which I prefer to employ for colouring the substratum so as to render it non-actinic are the compounds of carbon and hydrogen, or of carbon, hydrogen, and oxygen, or of carbon, hydrogen, and nitrogen, commonly known as derivatives of naphthaline, phenol, aniline, and toluidine.

These colouring matters are of such a nature that they disappear during the subsequent manipulations of development, fixation, and washing of the negative, they are readily dissociated by the chemical reaction set up by the developer, and they are, besides, freely soluble in the developer, in the fixing bath and in the washing water. They therefore disappear, and the resulting negative is of the usual quality and colour.

In case a very tenacious gelatine is employed for the substratum, it is sometimes necessary to somewhat prolong the washing process, so as to ensure that the colour is removed.

The interposition, in accordance with my invention, of a non-actinic coloured substratum or coating between the sensitive emulsion and the glass or other support effects two specific results, viz.:—

1st. During the necessary exposure of the sensitive plate or film to light, the non-actinic substratum prevents reflective halation, by obstructing the actinic rays of light in their passage to and from the glass plate or other support.

2nd. All reflected light which is returned into the plate or film is rendered non-actinic by its passage through the non-actinic substratum, and therefore solarisation is diminished or prevented, because the further free action of light during exposure is retarded in direct proportion to its actinic energy.

The claim is: In a sensitive plate or film for photographic purposes, a non-actinic, non-sensitive substratum or coating between the sensitive emulsion and the glass plate or other support, for the purpose hereinbefore described, the said substratum being coloured with non-actinic colour that disappears after the exposure, during the manipulations of development, fixation, and washing, or owing to chemical action set up during development, as set forth.

Improvements in connexion with Lamps, applicable for Optical Lanterns and for Signalling and other Purposes.

No. 12,656. John George Parvin, 47, Whittingstall-road, Parson's Green, London.—*April* 28, 1894.

I provide a metal box or cylinder, which may be composed of a single, double, or more cases connected together, and preferably cast in a single piece, and adapted to prevent short circuit of gases or fluids; this I term the generator.

When using a double cylinder, I pack the outer chamber with asbestos, wool, or other absorbent materials, the inner chamber being packed with asbestos, in layers, coils, or plates.

By a slight alteration of the arrangement of the pipes, the order of packing chambers can be easily reversed, *i.e.*, asbestos in outside chamber, and wool in inside chamber.

To the back of generator on the outside I fit, preferably, two pipes, joined by a T-piece, and the branch of the T-piece which is connected to the oxygen or gas supply I stuff with asbestos.

To these two pipes, where joined to said T-piece, are fitted taps, for regulating the supply of gas or fluid, one to generator and other to mixing chamber.

The first said pipe is carried to inside of generator and formed into concentric ring, rings, spherical helix, gridiron, or rose, perforated with holes, and upon or beneath said ring, gridiron, or rose, is arranged said packing.

The second pipe is carried through, over, or under generator to front of same to the mixing chamber.

A third pipe is fixed inside generator, and carried through to front of same to the mixing chamber, which chamber may be of the usual form as fitted to the ordinary oxyhydrogen mixed chamber jets.

The chamber may also pack with asbestos or other incombustible substance.

To the pipe or pipes in front of generator and communicating with mixing chamber I fit a tap or taps which can be worked from the front or back of instrument, either together or separately, for reducing the quantity of gas to mixing chamber when light is not required at its full height, also to prevent escape of gas or fluid when instrument is not in use, or I may attach a trap or valve to the chamber itself, or cap to nozzle of jet.

An opening through which is poured ether or similar fluid to be used is provided in the generator, said opening being closed with a thumbscrew.

To the generator I attach a piece of metal with a slot or groove cut out of

same, to which is fixed an elbow piece or other convenient-shaped piece of metal for carrying wheels, spindle, or clips, for holding, regulating, turning, and distancing the lime from the jet.

The gas, entering generator through the perforations in rings or gridiron in a finely divided state, is completely saturated in its up and down course through the chambers.

Should the gas, on being forced through the saturated material, carry with it an excess of fluid, this is strained off by the asbestos, which also prevents any foreign matter from passing; but, should the fluid from any cause rise above asbestos packing, it cannot pass into mixing chamber, as the gas, being the lighter, accumulates in space at top of asbestos, and so keeps the fluid down and prevents its passing into the pipe.

The saturated gas, after passing through chambers into pipe, and mixing with the unvaporised gas, produces a most brilliant light.

The above method of passing gas through saturated absorbent material, and then straining down surplus fluid, enables benzoline, ether, or similar fluid to be burnt, without the previous warming of apparatus, necessary when a less perfect system of saturation and packing is employed, besides a small quantity of gas is used in above apparatus.

The light is suitable for flashing signals, optical lanterns, and general illumination where brilliancy is required.

When used for signalling purposes, the generator is placed in a closed or partially closed case, preferably of metal, fitted with a lens or lenses, and a shutter worked by a lever spring or ratchet, operating the shutter, which may be in one or more parts, from the exterior or back of the apparatus, so that flashes of different rapidity and duration may be made.

When used inside the optical lantern, the generator is used in place of the ordinary lamp or jet apparatus, and is adjustable in height by means of screws, which enable the point of incandescence to be centered with lenses.

The claims are :—1. In limelight apparatus, a chamber consisting of two or more vapourising compartments, preferably cast in one piece, in combination with gas supply and delivery pipes. 2. In limelight apparatus, the combination of a chamber consisting of two or more vapourising compartments, gas supply and delivery pipes, and lime-carrier, spindle, and rod. 3. In limelight apparatus, a double chamber, in one of which plates, layers, sheets, or coils of asbestos cloth are tightly packed, and through which the gas passes prior to passing to the mixing chamber of the jet. 4. In limelight apparatus, the combination of a generator, gas inlet and regulating valves, pipe and exit pipe. 5. In limelight appparatus, a double vapourising chamber packed with two dissimilar materials.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

VIEW LENSES FOR PORTRAITS.

To the EDITOR.

SIR,—I want to ask you if a portrait or a view lens is the best for studio work? A friend of mine says the view lens is just as good as the other; and, if the object moves a little forward or backward, it does not throw it out of focus, as a portrait lens would. Also, can you tell me how the enclosed photograph is done with dark ground? I have seen them before, but fail to see how it is done. Your opinion will greatly oblige.—I am, yours, &c., A. COATEN.

Ludwell, Dorset.

[An answer to the former of these queries will be found by perusing one of the leading articles in the present number. With respect to the latter query (which refers to a bright head in profile on a black background), this class of picture is readily made by suspending a sheet of anything black—velvet, for example—behind the sitter.—ED.]

REVERSED NEGATIVES FOR SINGLE TRANSFER.

To the EDITOR.

SIR,—In your last issue I observe a letter signed "G. N. F.," in which the writer (evidently referring to the article written by me, and which appeared in your columns) refers to the difficulty he has experienced in producing negatives in the manner described.

"G. N. F." states that his stumbling-block has been halation, and that in his experience this has practically condemned what otherwise would be a very easy way of making reversed negatives. My experience does not coincide with that of "G. N. F."

In Scotland we have a good old saying, viz., "The proof o' the puddin's the preeing o't," and therefore I have taken the liberty of copying the front page of your last issue in the manner described, and forward for your inspection negative of same. Is there any halation?—I am, yours, &c., T. N. ARMSTRONG.

Viewfield House, Shettleston, near Glasgow.

[The negative sent is singularly free from halation.—ED.]

A REJLANDER APPEAL.

To the EDITOR.

SIR,—My last letter was forwarded to you during my absence from London, and I regret that it was not signed with the names of the Committee. I was instructed to give these names, as emphasising and giving urgency to the appeal for a fund which the Committee hopes will be a considerable one. A substantial sum is needed to place Mrs. Rejlander in a position to again earn her own living and beyond the necessity of further assistance. I shall be obliged if you will give space for the names of the Committee, and also for the first list of subscriptions which is appended.—I am, yours, &c., H. SNOWDEN WARD, *Secretary.*

6, *Farringdon-avenue, London, E.C., June* 4, 1894.

Committee:

Robert Beckett,
Frank Bishop,
R. Child Bayley,
F. W. Edwards,
Thomas Fall,
Alex. Mackie,
W. F. Mills,
Charles H. Oakden,
Andrew Pringle,
Edgar Scammell,
John Spiller,
Sir Henry Trueman Wood,
A. H. Wall.

First List of Subscriptions:

	£	s.	d.		£	s.	d.
Frank Bishop	5	0	0	Adam Diston	1	6	0
F. W. Edwards	5	0	0	B. J. Edwards	1	1	0
Thomas Fall.....	5	0	0	Walter Edmunds	1	1	0
Solar Club	4	0	0	Robert Rigby	1	1	0
W. S. Bird	3	3	0	E. P. Morris.....	1	0	0
Andrew Pringle	3	3	0	William Coles	0	5	0

RE "PERSPECTIVE AND THE SWING BACK."

To the EDITOR.

SIR,—Kindly permit me to correct one or two errors in this paper.

Print No. 11 was taken with a thirty-two inch lens, not three-and-a-half inch, as printed.

In the description of print No. 14, the word "perspective" occurs five times. In each case it should be, "point of sight." The height of the figure in the same print is one and a quarter inches, not one and a half, as printed.—I am, yours, &c., J. MCINTOSH.

14, *Lowman-road, Holloway, June* 4, 1894.

THE CENTRAL PHOTOGRAPHIC CLUB.

To the EDITOR.

SIR,—Kindly give me a small space. The Central Club is in luck's way. They are having the promise of some exceptionally good lectures, with slides, for the autumn and winter session.

Their first excursion is on the 16th, to Maidenhead. The Hackney Club will forego their trip into Herts and join them, and most probably another London Club will do the same. A resolution, passed at a recent meeting, to the effect that all members would take their cameras and take duplicate negatives of the same subject, on different makers' plates, and all negatives to be developed in the large dark room of the Club, using different developers, and a record made of the results.

Members and friends are invited to be present during the development of the plates.

The Railway Company offer special terms—1*s.* 6*d.* return.

Mr. Sebastian Davis and Mr. Slater will kindly arrange all details, and times, &c., will be duly advertised.—I am, yours, &c.,

9, *Baker-street, Portman-square, W.* THOMAS FALL.

A SOCIETY FOR DARWEN.

To the EDITOR.

SIR,—I have great pleasure in announcing that a photographic club has been formed in Darwen, called "The Darwen Photographic Association." The Committee have been successful in obtaining a well-furnished room at Belgrave School for meetings, &c., for a very small rent. The Council consists of President, Rev. Henry Irving; Vice-President, Jno. Broome; Committee: Jno. F. Leach, Jas. Cavis, Geo. Butterworth, J. W. Smith, Fred Thackeray, Albert Almond; Treasurer, Hy. T. Wade; Secretary, Jno. A. Hargraves, High Bank, Darwen, from whom fuller particulars may be obtained. This is the only Photographic Club in the district with 50,000 inhabitants. Subscriptions, 5*s.* per annum, commencing May 1, 1894. Meetings held monthly.—I am, yours, &c.,

High Bank, Darwen, May 1, 1894. JNO. A. HARGREAVES,
Secretary.
(On behalf of the Committee.)

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

A. DOOD.—Received.

VENTNOR.—Mono-carbonate of soda is meant.

PIP.—Fill the whole square, and then stop down if the light proves too strong.

A. JOHNSON.—No such work is published. Plenty of information on the subject of combination printing will be found in the back volumes of the JOURNAL.

WEMBLEY says: "I wish to take a few views in Wembley Park. Could you give me address where to write for permission?"—Doubtless the authorities at the Park are the right persons to ask.

S. WHEELER.—Colophony is soluble in methylated spirit, but its solution is not at all suitable as a varnish for negatives. Are you aware that colophony is only another name for the common rosin of the oil shops?

E. UNDERWOOD.—For precipitating silver from hypo fixing baths nothing has been found to answer so well as sulphide of potassium. Protosulphate of iron precipitates gold from its solution in the form of a metallic powder.

VICTOR SELB (Antwerp).—The prints should be washed quite free of acid before immersion in the hyposulphite. The forming of sulphuretted hydrogen when the proofs begin fixing may be taken as an indication that they would rapidly fade.

J. B. G.—Unless you elect to cut the mount of the lens, the best position for the shutter will be as close as possible to the lens; but, if the cutting open of the mount is not objected to, the best position of all will be one equidistant from the two lenses.

A. C.—If the negatives are fogged on one side or other through light getting into the dark slides, we know of no means of locally removing that fog. If the fog could be removed, the image would go with it. Avoid the fog in future by getting the slides repaired.

STUDENT writes: "I have a few whole-plate negatives, from which I have to make bromide enlargements. What form and focus of lens should I use for this purpose?"—Use the same lens that the negatives were taken with, or, if available, one of rather longer focus—say, one that will take a 10×8 negative.

BATH.—We cannot recommend you to rely upon the combined toning and fixing bath by the formula you give, or, indeed, any other "combined bath," if permanency be the chief consideration. Why not use the sulphocyanide toning bath, and fix afterwards? The results are better, and promise prints with a longer lease of life.

WESTWARD HO!—It is possible that the field of the lens might be a little flattened by slightly increasing the distance between them. Of course, by stopping the lens to about *f*-16 or *f*-20, marginal sharpness would have been obtained; but, in that case, a longer exposure would have been necessary. We are unable to offer more effective advice.

A. MALLETT asks who is liable for the piracy of a photograph, the stationer who sells, the wholesale dealer, or only the actual copyist, or all of them?"—All who have dealings in the pirated photographs are liable.

CELITO.—1. If the varnish is faulty, we should say, Discard it at once and get fresh. We cannot, of course, say how what you have can be made right, as you do not say of what it is compounded. 2. If the red spots are not to be accounted for by the prints not being kept moving about while in the toning bath, it is possible that the paper may be at fault. That point might be settled by trying some of a different make.

PHOTO.—You are not the only one visiting the "Academy" that suspects—some, indeed, know—that photography has largely assisted many of the artists in their work. If a photographer were paid to take a photograph of a certain view, or of a model, for a painter, to aid him in his picture, he could not charge the artist with infringing any copyright, nor would any right-minded photographer entertain any idea of doing such a thing even for a moment.

A. J. (South Norwood).—How is it possible, without knowing the amount of silver the residues contained, to hazard an opinion as to whether the refiner's return was fair or not? The data, "I think no silver has been thrown away," is of no value, nor is the number of negatives and sheets of paper fixed in the baths any guide. Had the sulphide of silver been dried and pure, and its weight given, we could then have said how much silver was recoverable.

RUSTIC.—No fault of the lens is shown in the picture. The converging lines at the upper part are due to the camera being considerably tilted to include the whole of the building, without the swing back being brought into requisition. Why, for a moment, should you surmise that the camera could be tilted in taking the interior of a building without using the swing back, any more than it could be in taking the exterior? There is no difference in the conditions.

W. F. says: "As I have a number of pianofortes to photograph, would you kindly tell me what I must do to take the gloss away without damaging the polish of the pianofortes?"—Arrange the lighting of the pianofortes in such a manner as to avoid reflections.

R. S. O. (Yorks).—If you intend to enlarge on bromide paper by daylight, no condenser will be necessary. If, however, artificial light be used, a condenser of eleven inches diameter will be necessary for a whole-plate negative. Any lens with a tolerably flat field that will take a sharp whole-plate negative will answer.

J. ROBBINS.—Mr. Francis Bedford went on his Eastern tour with the Prince of Wales in the beginning of 1862, and returned to London in June of the same year. In a month after his return he exhibited his pictures to the number of one hundred and seventy-two, mostly 12 × 10, in the German Gallery, Bond-street. They were all produced by the wet-collodion process, the artist working in a small tent. The lenses employed were single landscape ones.

A. H. (Manchester).—We cannot offer any opinion as to why some artists' prints should show spots when mounted and other artists' not when mounted in an album of white boards, and not in albums of tinted boards. Possibly some of the prints were more stable than others. Flour paste is not to be recommended for mounting purposes so much as starch is, on account of its liability to decomposition. Probably some of the prints were mounted with paste in which decomposition had commenced.

T. GIBBONS writes: "Would you kindly answer the following questions in 'Answers to Correspondents' column? 1. Fixing bath that has been used after toning prints—would it be injurious for fixing negatives? 2. What is the cause of the numerous white specs upon face of print that is printed from a first-class retouched negative?"—1. Probably not; but, as hyposulphite of soda is so cheap, it is much better to use a fresh solution. 2. We cannot say, except that it is not due to the retouching. Similar spots would, doubtless, have appeared had the negative not been retouched.

STUDIO says: "I have built a studio in my garden, but I could not get a north light, therefore the sun shines inside. Could you tell me what to do to keep it out and still have a top light? I give you a sketch on the other side of studio, and how the sun works round."—The sun can be stopped out in several ways. The simplest is to have some thin white muslin strained on light wooden frames to fix, either temporarily or permanently, on the roof. We cannot say which is preferable in this case, as the actual aspect of the studio is not given. Instead of the muslin the glass might be stippled over with a mixture of starch paste and whiting.

WATER.—One of the easiest methods of rendering hard water soft is to add and stir up with it a small quantity of lime water. We know quite well that lime is present in hard water, but so also is carbonic acid, in addition to that present combined with lime. This acid combines with the lime held in solution in the lime water, and after a short time the carbonate of lime is precipitated, leaving the water softer. A half-pint of lime water suffices for two gallons of hard water. It takes about twelve hours to precipitate the carbonate of lime. The lime water is made by putting fresh caustic lime into a vessel of water, and allowing it to stand for a few hours, after which it remains always ready for use.

C. N. & CO. write as follows:—"We have had a furnace built, properly constructed, for smelting residues (silver). Although every possible care is taken to get a gradual and uniform heat, we are troubled with the crucible (sand crucible) cracking while in the midst of reducing. We should be greatly obliged if you could point out where the error lies, as surely there must be a remedy, otherwise it would never pay refiners doing the work."—With care, the crucibles will not crack. Probably a draught of cold air gets to them while in the fire. That would be sure to cause a fracture. The pots should be allowed to get thoroughly dry and warm before they are put into the furnace. It is a good plan to have in a good stock of pots at a time and store them over the furnace, so that they may become "seasoned" before using them. New pots are not so good as those that have been made some time.

J. DAVIES says: "I enclose specimen of paper which I received when I ordered albumenised paper from a photographic dealer. I find that I cannot get a print from it, neither will it change colour when exposed even to the sun. The dealer tells me that I should have ordered sensitised albumenised paper. Now, will you kindly explain what the difference is between the sample enclosed and sensitised albumenised paper, and for what use the paper is which I send you? I am at a loss to understand the difference, as I have only seen and heard of the one albumenised printing paper."—The difference we should have thought would have been obvious. The sample sent is plain, unsensitised, albumenised paper, and, of course, will not yield a print, to obtain which you must use the sensitised variety—that is, albumenised paper impregnated with silver salts. The dealer was quite right. Apparently you require a little elementary instruction in silver printing.

*** *With this number of the* JOURNAL *is presented a portrait of Sir Howard Grubb, F.R.S., President of the Photographic Convention of the United Kingdom,* 1894–5.

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SWING BACKS AND THEIR USES.

When we reflect that there are now several thousands of cameras in use in which the sensitive plate is perforce, and as necessity of their construction, compelled to be at a right ngle to the axis of the lens—for only a small fraction of the and cameras have swing backs, and when we further reflect hat among the innumerable amateurs who are daily entering he ranks of photographers, and are ignorant of what a swing ack to a camera is and what purpose is served by it—some emarks upon its nature, its use, and abuse will not be out of lace at the commencement of the out-door photographic eason.

For such indoor work as sitting figures, the swing back is ot now of the same consequence as it was some time ago. In ormer times, when lenses of a large aperture had to be em-loyed, and a sitting figure was the subject, if the head was laced in sharp focus, the knees and any hand resting on the nee would be quite indistinct and out of focus. The only emedy for this was to swing the upper part of the ground lass away from the lens so as to sharpen the knees without isturbing the focussing of the head. This, when the point of ight was at no great distance from the sitter, necessarily aused the knees and hand to be depicted on a scale larger han that of the head, and gave rise to animadversions, espe-ially by ladies, relative to the tendency of photography to make large and unsightly hands. With a better art education, enses of proportionately longer foci, less aperture, and more sensitive plates, errors of this nature are largely disappearing, and the swing back of the portraitist is getting more and more into disuse.

It is in the photographing of architecture where its advantages are most apparent. It is an absolutely indispensable condition, when taking a building free from distortion, that the ground glass shall be vertical, inclining neither to the top nor to the bottom. This condition is secured when the camera is placed quite level; but it usually happens that, owing to the proximity of the camera to the ground, five feet being a usual height, only a limited vertical angle, quite inadequate to show the top of the building, can be included. The first obvious remedy for this is to direct the camera upwards, so as to have the whole included; but, were a picture now taken, the perpendicular sides would be found to converge to such an extent as to produce more or less hideous distortion, an inevitable concomitant of the law we have alluded to, viz., that the sensitive plate must be in a vertical position. If there is a swing back to the camera, and the ground glass is brought by its operation into verticality, a remedy is at once provided, and the building is once more free from distortion, subject to this, that it is a little squatter than it ought to be, although this will scarcely be noticeable. The top and bottom will also be out of focus if the centre is sharp, but this is remediable by the insertion of a small diaphragm, which gives a degree of depth of definition sufficient to make every part practically sharp.

A more theoretically perfect manner of obtaining an undistorted view of the building would be to level the camera, one with a rigid back sufficing, and slide the lens up as close to the top of the camera front as possible. This, however, can only be effectively done when the lens includes an angle wide enough to permit of this being done without showing the circle of darkness that limits the utilising of this system.

But even this may be accomplished with a lens that includes an angle of view so narrow as just to cover the plate and no more. To do so it is only necessary to have the lens mounted in such a manner that, when by the sliding camera front it has been pushed up to the top, its axis is made to lie in the direction of the centre of the plate. Numerous mechanical appliances for effecting this end have been published, probably the simplest of them consisting of the hinged front, now so common in many of the portable bellows-bodied cameras.

One very excellent use to which a swing back can be put in landscape work is to secure the sharpening of shrubs, flowers, or other objects of attraction and beauty in the foregrounds of pictures. Unless a very small stop is used in the lens, a distant scene and a foreground object are not rendered with equal sharpness. To ensure this, the sensitive plate must be placed obliquely to the axis of the lens, its top, on which the foreground is depicted, having to be moved away from the lens often to a considerable extent. When a scene is viewed in nature, the foreground, from its proximity to the observer, always asserts itself strongly, and, unless otherwise objectionable, so ought it to be in a photograph. The tilting of the plate backwards in the manner suggested permits of this being done in the most effective manner.

If, with a rigid camera, it is found necessary to point it upwards in order to get in the top of a building, the negative obtained under these circumstances will certainly show the distortion of convergence. But this need not very greatly distress the photographer, provided it is otherwise good and sharp, for from this distorted negative can be produced another almost equally as good as the original, and from which the distortion is entirely eliminated. All that is necessary is to make a contact transparency from the original, and then make a negative from the transparency by means of the camera, swinging the

back in doing so until the converging lines in the transparency are brought to a state of absolute verticality on the ground glass, after which the exposure is made. While experimenting in this direction, we have found a lens of short focus better for the purpose than one of longer focus, and let it not be forgotten that, when anything is being copied its own size, the focus of the lens is for the nonce lengthened to twice its solar focus.

If the operator has only a solid-back camera when making the rectified reproduction of the distorted negative, then must such negative be placed in a leaning position in front of the camera, and not squarely. In either case a very small diaphragm should be used with the lens.

BLISTERS AND OSMOSE.

We have lately, in consequence of having received so many complaints as to the blistering of albumenised paper, again taken up the subject, and carried out a series of experiments to throw light upon it. We may briefly epitomise the two leading, and apparently contradictory, views held on the subject. The opinion as to the cause of these annoying occurrences most commonly held is, that a blister is formed through a swelling of the albumen at a portion of the surface where it is less adherent to the fibres of the paper than elsewhere; in consequence, the swelling of the film of coagulated albumen causes it to rise, and, concurrently, the vacant space between film and support is filled with liquid, which permeates through the paper. The main objection to this theory is, that the paper is not sufficiently porous to permit water to pass through unless some other cause or force be present. The other theory possesses a more scientific basis. It does not ignore the possibility of the skin of albumen being less strongly attached in one place than another, but it relies upon the presence of water being a cause, and not an effect, of the blister, and holds that an external cause is always at work, endeavouring to put water between film and paper, and that, whenever the adherence is not complete, its force has full play, and places the water into those spots. This force, often referred to by us, is termed osmose, and is well known to all physical investigators. Whenever, for example, a salt in solution is separated by a membraneous diaphragm from a quantity of the solvent itself, a tendency exists for the outer water and the dissolved salt to change places. The extent of this tendency varies according to the salt, and we may here say that different liquids also exhibit a similar tendency. Further, the tendency is sometimes in the reverse direction; and, finally, we may add, the tendency may be profoundly modified, to the extent either of complete neutralisation, *i.e.*, that the exchange takes place in equal proportions; or it is reversed, that is to say, more of the saline or cognate substance passes through than water passes to replace it. It is thus seen that, as the osmotic action of hypo, as modified by the addition of other substances, is not to be found in published tables, the possible effect of any added substance in this direction can only be ascertained by experiment. We have only dealt with the latter of the two views described, as we are quite of opinion that the other will not fit all conditions observed, not to speak of its containing no germ of suggestion of a remedy.

The first point to be ascertained was whether the actual tendency, as we term it, for an exchange of water and hypo, the former in excess, did really take place. The apparatus we employed was the well-known glass dialyser, a small vessel shaped like a funnel, with semi-globular sides, and with its neck removed and widened so as to admit of the insertion of a wide cork. The wide part of the dialyser is flanged so as to admit of a membrane stretched across it being tightly secured by twine. The membrane commonly employed in these experiments is parchment paper or bladder, usually the former. It is necessary, in using the parchment paper, which can be obtained at any chemical warehouse, or, failing that, may be purchased at the stationer's, who sells it as covers for jampots—before using it, it is necessary to hold it up to the light and closely scan it for the presence of any minute hole, which would vitiate entirely any experiment on osmose. As these apertures are very frequently found, it may be said that the way to remedy them is to fasten a small piece of the paper over the spot by means of albumen, and then pass a hot iron over the spot to coagulate the albumen.

Passing now to the first experiment, we prepared a dialyser in the manner described, and, placing it on the table, poured in sufficient twenty per cent. solution of hypo to entirely fill it, and then placed a cork pierced with a central aperture to permit the escape of the liquid. This done, we carefully wiped away the overflow, and placed the apparatus in a large glass jar of water, suspending it by a string tied to the neck, and attached to a glass rod put across the jar. If any doubt existed as to the action, it was soon set at rest, and the result was most instructive. The dialyser had not been in the jar five minutes before falling streams were seen to come from the paper surface, showing that the hypo was coming through into the jar. This result, if not counteracted, would of course result in diminishing the bulk of the contents of the dialyser. If this were to take place, the aperture in the cork permitted the entry of water to supply the place of the emitted hypo. But so far was this from occurring, that the very opposite effect was seen. Not only were streams seen issuing from the paper, but also from the cork itself. The liquid was actually running over and mixing with the other liquid, an effect that continued for a long time. Here evidently was proof to convince the most sceptical that a power does exist which, besides causing the well-known diffusion, also causes a greater amount of water to come into the apparatus than of salt going out. The next point to discover was, Had this tendency sufficient power to overcome any obstacle to its exercise—such, for example, as would be offered by the adhesion, partial or complete, of albumen to paper? We proceeded to test this point, with sufficiently interesting results, which, not to make this article too long, we will describe on a future occasion.

THE DEVELOPMENT OF POSITIVES ON OPAL.

Developed positives on opal have achieved a popularity at the present day that they have never hitherto possessed, owing mainly to the excellence of the films now at the disposal of professional and amateur alike. But, although the amateur is not slow to appreciate the beauty of the results thus obtainable and actually obtained by his professional brother, it is seldom that he succeeds in utilising to the fullest advantage the means at his disposal.

It is not that there is any difficulty in the manipulations to render the production of a perfect opal any more formidable a task than a negative; on the contrary, the development is, if anything, easier in the case of the positive, inasmuch as the actual appearance of the image is easier to judge than the

probable printing effect, and, provided there is a good negative to work from, not the least trouble need be experienced. In fact, it is not in the principles of the photographic process that the amateur too frequently fails, but from want of attention to some of the most ordinary details of the routine.

The chief faults met with are a general untidiness and want of finish, although not unfrequently faults of tone and gradation are also present; but these, too, can generally be set down to want of care rather than to any deliberate departure from correct development. A very common mistake consists in the employment of very sensitive films for contact printing, where the slower ones not only answer the purpose equally as well, but are really preferable, on account of the greater ease of manipulation. It would be well, in fact, if those makers who issue two kinds of plates of different degree of rapidity would lay more stress on the fact, that the quicker ones are more particularly suitable for enlarging and the slower for use in the ordinary printing frame.

The first point to which we may call attention is the style or get-up of the picture. Unlike a paper print, the opal cannot be trimmed after development, and, unless intended for framing without margin, it is necessary to adopt some means by which a suitable margin is produced in the process of printing. In the case of enlargements this is easily done by vignetting or masking, and the average amateur who is sufficiently advanced to practise the enlarging process would probably take the needful steps as a matter of course. But too many of the rank and file of amateurs, who print by contact, deem nothing more is necessary than to place the sensitive opal plate upon the negative in an ordinary printing frame. Here, of course, if the positive is to be framed close up, nothing more is necessary, as the margin produced in printing will be covered by the rebate of the picture frame. Large numbers of quarter and half-plate opals are mounted in plush and similar frames with oval and other shaped openings, which, of course, obviate the necessity for any special preparations unless for the purpose of vignetting.

But a still larger proportion of the opals used are intended to be fixed in frames or mats that offer little, if any, protection to the edges of the plate; besides which, not all subjects are suitable for framing close up or without any margin; hence, in the great majority of cases, it is absolutely essential to provide a suitable margin in the course of printing. This is done either by masking or vignetting, the former being the easier plan, and in many cases equally as effective.

But, even in so simple a process as this, it is possible, by not going the right way about it, to entirely destroy the effect of an otherwise good picture, first by the selection of an unsuitable shape of mask or one not of the correct size, and secondly by not fixing it properly with regard to the subject or the centre of the opal. We often see opals in which the opening of the mask shows twice as much margin at one side as the other, which is highly objectionable, although, with regard to top and bottom, it is not of so much importance. It is not a very easy matter to secure perfect symmetry in this direction in the dim light of the developing room unless some systematic method be adopted, and the following we have found at once simple and efficient. Take a printing frame one size larger than the negative, or rather opal, to be produced (for a masked opal may be made from a smaller negative), and select a mask of the same outside dimensions as the opal itself. The opening in the mask will be, or at any rate should be, in the exact centre; it is only necessary, therefore, to ensure that the outside edges of opal and mask coincide in the printing frame in order to ensure a uniform margin in the finished picture.

To secure this condition, which is not very easy in the dark room, let the mask be first arranged in its correct position on the negative in daylight, and let it then be placed in the printing frame so that one of its (the mask's) corners and two of its sides lie accurately against the corresponding corner and sides of the printing frame, which, for this purpose, is preferably of the box form. The whole arrangement is then removed to the dark room without disturbing the relative positions of negative and mask, and, if the opal plate be now inserted, so that two of its sides lie in the same way against those of the frame, the coincidence of mask and opal will be perfect.

Many amateurs, with the laudable view of securing all the sharpness possible, commit the mistake of placing the mask on the glass side instead of against the film of the negative, by which means a blurred and hazy line is produced, which is in the highest degree objectionable, as it is neither absolutely sharp, nor, on the other hand, soft enough to convey the idea of vignetting. If the mask be placed between the negative and the sensitive film, its effect upon the apparent sharpness of the image will be absolutely inappreciable, while its own outline will be sharp and clear cut. Where a printing frame is set apart, specially for opal work, it is a good plan to paste strips of opaque paper round the margin of the front glass and the woodwork, in order to prevent the admission of light to the edges of the opal. In printing a small opal from a larger negative, the easiest way to proceed is to mark boldly on the mask with pencil, which will be plainly visible in the dark room, the position the opals should occupy in order to secure a symmetrical margin.

Passing from masking to vignetting, the latter process is not altogether so easy with artificial light as it is in daylight, owing to the angle at which the light strikes the vignetting screen, instead of falling in a parallel direction. The same general principles prevail in both cases, but, owing to the difficulty of obtaining sufficient softness when a cut-out vignetting mask is used, the following plan will be found preferable:—Use one of the ordinary vignetting glasses or graduated papers, selecting one with as perfect gradation as possible, and rather small for the amount of subject it is intended to include; but, instead of placing it in contact with the negative, as is usually done, separate the two by a distance of at least a quarter of an inch, or, when great softness is desired, half an inch. Before making the exposure, arrange the position of the printing frame so that the light strikes the centre of the vignetting mask at right angles or perpendicularly, and the gradation will then be uniform and symmetrical. A still better result will be obtained by means of a rotating frame, but the above answers all ordinary purposes.

With regard to the light employed to impress the image, we are of opinion, not only from what we have seen of amateurs at work, but also from an examination of the results produced, that a great and prevalent mistake consists in using too strong a light even when the slower kinds of plates are in question. The direction issued by most of the makers of opal plates give the exposures estimated to be necessary at a certain distance from a "good gas burner." Now this, we venture to think, is altogether wrong, more particularly with some of the quicker plates, with which, and a negative of a soft or delicate character, a fractional part of a second, more or less, will

sometimes make all the difference in the quality of the results. But we have actually seen amateurs attempt to make the exposures of moderately quick opal plates as well as bromide papers to daylight, and then wonder why they failed in getting brilliancy and contrast.

Far better is it to employ a much feebler light, such as that of an ordinary candle or night-light, when, without unduly protracting the exposure, the necessity for such extreme exactitude ceases. With negatives of ordinary density, and such as are suited to the requirements of opal printing, and using a paraffin candle, twelve to the pound, that has been burning some minutes, an exposure of about ten seconds with one of the more rapid kinds of plates has been found ample, while with the slowest the time would scarcely need extending beyond half a minute or a minute.

By adopting the weaker light not only is greater latitude in exposure attained, but results of a brilliant and vigorous character are easily obtainable from negatives that, from their thinness and delicacy, would be otherwise useless with many of the opal plates in the market, for it is well known that some of these require, in order to give the best results by development, a much more vigorous type of negative than is needed in the case of the print-out opals and papers.

While on this part of the subject, we may allude to a method we have found of great value in our own work, although we are aware its efficacy has in years gone by been questioned or altogether contradicted. We allude to the plan of varying the distance of the source of light according to the density of the negative in use, the thinner the negative the greater the distance it is placed from the light for exposure, the length of time being, of course, proportionately increased. Without, at the present, entering into a discussion, theoretical or otherwise, our experience is, that with a rather thin negative a better result will be obtained with an exposure of forty seconds, at two feet distance, than with ten seconds at one foot, although the relative exposures are the same. In the former case there will be more vigour and contrast, and, in fact, greater brightness throughout.

Another expedient that has been frequently recommended and as often decried consists in exposing a thin negative, such as already alluded to, under tissue paper, or other similar media; but we find more especial benefit in the use of a *coloured* medium in contradistinction to one that merely arrests or diffuses the light. Thin yellow tissue paper, or a transparent film of varnish, collodion, or gelatine, tinted with aurine or turmeric, are equally effective, though perhaps the transparent colour is to be preferred. The depth of tint will, of course, have to be varied with the sensitiveness of the plates as well as with other conditions.

Having gone through the mechanical side of the question, we shall, in a second article, refer briefly to the chemical portion of the operation, including development and finishing.

Another Antidote for Cyanide of Potassium.—According to a daily contemporary, Dr. Johann Antal, a Hungarian chemist, who has devoted much time to toxicological research, reported a few days ago to the Hungarian Society of Physicians that he had discovered that nitrate of cobalt was a most efficacious antidote to poisoning by cyanide of potassium and prussic acid. He tried the antidote first on animals, and afterwards on a number of persons who had been accidentally poisoned with prussic acid, and in not a single case did it prove a failure.

Photography at Greenwich.—The report read at the annual visitation of the Board of Visitors of the Royal Observatory shows that photography has been actively employed during the past twelve months. With the astrographic telescope, 280 photographs of forty minutes' exposure were made, 220 of which were successful; and for plates for catalogue with exposures of six, three, and twenty minutes, 508, of which 387 are a success. The number of fields photographed for the chart was 200, and for the catalogue 367. With one heliograph or another records of the solar surface have been secured on no less than 230 days during the year. Last year, it must be remembered, was a phenomenally propitious one for photography. Sir Howard Grubb has been commissioned to construct for the Observatory a photographic telescope of twenty-six inches aperture and twenty-two feet six inches focus. This instrument will be the gift of Sir Henry Thompson, he having presented the sum of 5000*l.* for the purpose.

Weather Forecasts.—The Board of Agriculture have arranged to repeat, on an extended scale, the experiments of last year of exhibiting at the telegraph stations in the rural districts the daily forecasts of the weather, issued by the Meteorological Office, during the times of the hay and corn harvests. The counties chosen for the experiment are Somerset, Carnarvon, Ayr, Cambridge, the East Riding of Yorks, and Haddington. The forecast will be that issued each afternoon, and may be expected to reach the rural offices daily in time to be available to agriculturists in making their arrangements for the following day. These forecasts should also, at times, prove very useful to photographers, as they may, if correct, sometimes save them making a fruitless journey. The Board hope that those interested will observe the degree of agreement of the forecast with the weather actually experienced in the locality, so that it may judge whether the system is of sufficient utility to be continued and extended.

Amateurs' Work.—At the last meeting of the Croydon Camera Club attention was called to the circular issued a short time back by the *Graphic* to amateur photographers, inviting them to contribute pictures to the illustration of that journal. The circular was very unfavourably commented upon by members present, who characterised it as a scheme for obtaining "something for nothing." It will not be at all surprising if the subject is brought before many other societies. If any work is good enough for reproduction in a high-class illustrated paper like the *Graphic*, surely it is good enough to be paid for, and it is to be hoped that amateurs will look at the matter in that light, and not supply pictures gratuitously. The profession have fixed a minimum fee for the right to reproduce their works; why should not amateurs do the same? The question might arise as to whether an amateur, granting the right of reproduction for a money charge, ceases to be an amateur? Be that as it may, there is a very simple way out of the difficulty. Let the amateur make it a condition of his pictures being used that the publisher sends a fee of half a guinea or a guinea for each to the Photographers' Benevolent Association. This deserving institution would be benefited, and amateurs could not be charged with unduly competing with the profession.

The Merchandise Marks Act.—As we surmised when commenting a fortnight ago on an answer given in the House of Commons as regards the importation of foreign goods, that answer has led to other questions being put, as well as to several letters in the daily press on the apparent anomalies of the Act. A few days ago the President of the Board of Trade was asked why goods had been stopped by the Customs authorities at Queenborough, because they bore English words on the wrapper, and notwithstanding that they were also marked with the country of origin? and why was the procedure at Queenborough different from that of London, where foreign bottles marked with English words were admitted? Mr. Bryce, in reply, said that the proceedings at Queenborough and London were identical, but that no parallel could be drawn between the two cases cited, and added that "The Commissioners of Customs

ndeavoured to interpret the Act, but the administration of it at British ports was not in the hands of the Board of Trade at all." This is quite contrary to what most people surmised, which was that he prosecuting of offenders was the duty of the Board of Trade. From the correspondence in the press, it would seem that Christmas ards and such things are now admitted by the Custom authorities f the words "Printed in Germany" merely appear on the bands inding the dozens together, or even on the wrappers of the grosses. We, however, know of instances of collotypes and photogravures eing stopped because each individual print was not so marked. t is pretty clear that the Act at present is carried out in a very nomalous way, if it is not almost a dead letter.

A NEGLECTED METHOD OF PRODUCING STUDIO BACKGROUNDS.

[Autotype Notes.]

[It seems to be a recognised fact that, during the past year, there has been, unfortunately, a great stagnation in the portrait business; and, for this reason, some photographers will, no doubt, forego the acquisition of such new backgrounds for the present season as might otherwise have been the case. Now, the preparation of new backgrounds, either plain or graduated, or the renovation of old ones, is by no means the difficult matter many appear to imagine. Nor is it, indeed, to make scenic ones, even when the producer has but a limited or no knowledge of drawing. The photographer who can make his own backgrounds in spare time is enabled, at a small cost, to possess such a variety that one or other of them will be suitable for every class of picture.

One of the most simple—and, at the same time, one of the best—methods of making backgrounds is a very old one indeed, though it seems to be but little known to modern workers, hence my reason for directing attention to it now. It was introduced in the very early days of photography, and was, later on, sold as a secret method. It is what is sometimes termed the "powder process," and is adapted alike for plain, graduated, or scenic backgrounds. Here is the method of procedure:—

On a wooden frame, the size desired, strain a piece of common unbleached sheeting. It may be obtained in different widths, up to about nine feet, at any draper's or upholsterer's. Next mix intimately together some powder colours and dextrine. Any colours may be used, according to taste. Whiting, lamp-black, umber, Venetian red, &c., as supplied at the oil shops, all answer the purpose well. The actual proportion of dextrine cannot be given, as it will vary with the pigments employed, some being heavier or lighter than others; but sufficient should be used to fix the colours to the canvas. It is better to add too much than too little, as an excess is not of much moment. If a graduated background is required, the powder colour should be mixed in two or three grades, by increasing or otherwise the proportion of black. Such a background, I shall here assume, is the one desired, and this is how we proceed to obtain it.

Place the frame, with the canvas upon it, on the floor, and sprinkle it over liberally with water. A garden watering-pot, if it have a fine rose, is a good thing to use for the purpose. The canvas must be made thoroughly wet, and not simply damped. The frame should now be allowed to rest for a little while, for the moisture to become thoroughly diffused; and, if it be stood upright, any excess of water, should there be any, will drain out. When it is judged that the moisture is pretty well diffused, the frame is again laid on the floor, and some of the colour mixture—the lighter shade—is sprinkled over it. The most successful way to do this is to sift it from a fine sieve; it will then be fairly evenly distributed. After the lightest tint has been applied, the next shade darker is sifted over it where thought desirable, and afterwards the darkest. As soon as a tolerably even layer of the different tints seems to be obtained, take a stiff brush—a clothes brush with a handle is well adapted for the purpose and, with a circular motion, work the colours well into the wet fabric, blending them as desired in the operation. The operator need not be afraid of rubbing, as the object to be attained is to get the colour into the body of the fabric, and not have it simply on the surface alone. If, as the work proceeds, any part should appear deficient in pigment, more can be applied and brushed in, without fear of the background appearing patchy when finished. When the background looks satisfactory, it is reared up against the wall and allowed to dry.

If, when the background is dry, it is not considered satisfactory, too light or too dark, or the shading not to taste, for example, it is easily altered. The fabric is again wetted as before, and more pigment, according to requirement, is applied and well brushed in. If, perchance, a background of this description gets injured, say by water through the roof—not an unknown thing—or by scratching or rubbing, it is easily restored to its pristine condition. All that is necessary is, after removing any adherent dust, to re-wet it, and give it a good brushing; then, when dry again, it will be as good as new. By this method very handy little backgrounds for bust portraits and vignettes can easily be made. By putting in some cross hatching with a stick of charcoal or black crayon, very excellent backgrounds for portraits, in imitation of "Richmond Heads," may be produced.

Effective backgrounds of local scenery can readily be made by this method by the photographer himself, even supposing he is not a draughtsman. In this case some of the pigment and dextrine, with different proportions of black, is moistened with water and roughly moulded into large crayons, also some with whiting and dextrine, and dextrine alone, and allowed to dry. Supposing the operator cannot draw, a transparency is made of the scene required and placed in the enlarging lantern. Then the image is projected on to a dry and finished light, plain or graduated, background, and then boldly sketched in with the crayons, using darker or lighter ones according to the depths of the details. The lights are then put in with the white crayon. This, by the way, is a job that is best done at night when it is dark. Then, in the morning, the fabric is wetted all over, and the broader details softened with the brush, and the finer ones with a tightly rolled-up piece of hard felt. The highest lights and deepest shades may finally be strengthened, if found requisite, after the background is dry, with a few firm touches with the white crayon for the high lights, and a stick of charcoal for the deepest shadows.

E. W. Foxlee.

JOTTINGS.

The *Graphic* is an excellent illustrated weekly newspaper that has often been cited as a good example of the artistic and financial success that attends well-distributed journalistic energy and enterprise. Apparently, however, if we are to judge from a circular that has recently emanated from the office of that paper, the success of the *Graphic* is due less to the causes named than to the supremely economical way in which it has all along been obtaining its illustrations. During the twenty odd years of its existence we must assume that it has been fortunate in having a band of talented artists to work for it *for nothing*. For nothing, dear boys! Think of that! No wonder the *Graphic* Company has always paid handsome dividends! No wonder it is so simple to make big fortunes out of illustrated newspapers!

The artists and draughtsmen, who by their gratuitous labours have enabled the proprietary of the *Graphic* to run that paper so easily and so well all these years, having, I supposed, worked themselves out or grown tired of their unremunerative occupation, the editor of the *Graphic* has found it necessary to tap a new source of free illustrations, and, in a moment of great inspiration, has addressed a circular to amateur (and professional) photographers all over the country, inviting them, in effect, to supply the *Graphic* with photographs suitable for reproduction. The editor reserves a full right of rejection or choice, and for those photographs he may use he offers to pay the producer—nothing! In other words, photographers who have given time and thought, money and labour, to the making of good or artistic photographs are asked to supply, gratuitously, the material for helping the editor and proprietors of the *Graphic* to draw handsome salaries and profits out of that paper, and are not even guaranteed out-of-pocket expenses in return. A more glaring piece of impudence I have never before met with. I wonder what the proprietors of the *Graphic* would say to me if I asked them to put me on their free list, or requested the use of any of their blocks, for illustration purposes, or wanted to borrow their machinery, type, ink, labour, or bank balance?

I do most sincerely hope that no photographer, be he amateur or professional, will be a party to the little plot which the *Graphic* is starting. The effect of giving that or any other paper the free use of one's photographs is bound in the near future to have a disastrous result for professional photographers

generally; for, when conductors of papers find that they can get the use of good photographs for nothing, it is scarcely likely that they will pay for them, so that professional men are certain to be the ultimate sufferers, while the amateurs will not be the gainers. Hence I say: Photographers, do not fall into this trap, and do not inflict another blow on an ill-used art and a languishing profession. Let us have no "blacklegs." Let us "abstain in our thousands" from giving the editor of the *Graphic* something for nothing, and thereby read him, and others of his class, a much-needed homily on the futility of attempting to profit by the labour of others without paying for it.

To me, as an old student of these pages, no part of the JOURNAL is so interesting and, at the same time, so amusing as that devoted to the publication of patent specifications, for therein I often read what is to a large extent the outcome of recorded experiments and investigations made many, many years ago. Some of the ideas patented are suggestive of nothing so much as the existence of a wide belief that photographic workers of ten, twenty, or thirty years ago were people of no resource in emergencies and were powerless to strike out untried paths of experiment and research. It would also seem that photography includes within its ranks a large number of noodles, who will not go to the trouble of acquainting themselves with what has already been done or tried in a practical way before adventuring or exploiting "new" processes or inventions. Rip Van Winkles by the score also seem to abound. Here, for example, are four gentlemen who must infallibly come under one of the foregoing heads, and whose melancholy fates I hope will serve as a lesson and a warning to other would-be patentees who may, through ignorance or other causes, be inclined to waste their money, time, and trouble in protecting old and exploded ideas. The first is Mr. Otto Magerstedt, of Berlin, who (see page 170) "patents" a method for preventing halation by placing between the sensitive layer of emulsion and the plate "a layer coloured with dyes" of the aniline and other series; the second, Mr. E. Norman, of Hatcham, who (page 221) "patents" a printing-out process in bromo-nitro-oxalate of silver; the third, Mr. William Joseph Dibdin, who (page 350) "patents" the use of a Nicol prism in conjunction with a lens; and the fourth is Mr. C. E. Pettitt, of Torquay, who (page 366) "patents" an anti-halation-plate process, exactly similar to Mr. Meth's. If it is essential to the validity of a patent that it comprehends old, well-known, or discarded ideas, why, then, the four I have named are fully capable of holding water; if it is not, they are just about as leaky as colanders. So long as our Patent-Office system connives at defrauding ignorant inventors in this stupid and wicked fashion, so long shall I denounce its tricks and manners, and condole with the unhappy victims of its rapacity and greed.

Auctioneers make considerable use of photography for depicting houses, &c., to let, but I wish I could persuade the gentlemen of the hammer to be less unjust to the black art, as well as to the properties they, by its assistance, endeavour to dispose of. I do not think I exaggerate in saying that the photographs usually displayed by auctioneers would be difficult to beat as examples of how technically bad photographs can be made. A double injury is thereby inflicted; in the first place, a false idea of the capabilities of photography is disseminated among the general public, and the scenes or houses photographed are not shown to the best advantage. In taking houses and other buildings, those who supply photographs to auctioneers rarely select the best point of view, but invariably content themselves with including as much of the subject as possible on the plate, without paying regard to any opportunity for picturesqueness of treatment, perspective, or effect. It is time all this was changed.

I was surprised to see a correspondent condemn the method of making reversed negatives by exposing the glass side of the plate outwards, on the ground that halation was thereby superinduced. I have used this method for several years, sometimes on very trying subjects, but, so far, I have not noticed that it conduced to a greater amount of halation than the usual plan of exposing through the film. I fancy "G. N. F." is rather shaky in his physics when he says that, in "taking portraits through the glass of the plate, there must of necessity be a certain amount of diffusion of light, owing to the reflection from the inner surface of the glass." In speaking of diffusion and reflection, he is confusing two entirely different things, and, though he disclaims "mere" ideas or theories, I think I may safely say that he is far from being practical in his notions. If light *is* reflected from the back surface of the glass (which I doubt), perhaps "G. N. F." will kindly inform us how that can affect the image.

The programme put forward for the Convention to be held in Dublin, in the week commencing July 9, is a very attractive one, and I hope to be one of those from this side of the water to take advantage of the proffered hospitality of our brethren across the Irish Channel. But—oh, my! hav'n't we risen in the world! Fancy the *élite* of the Dublin aristocracy, civic officialism, and the scientific and learned bodies banded together as a committee of reception for us! Why, what with the gorgeous opening *conversazione* and reception, the excursions, the dinner, the papers, the old Irish hospitality, and things, we shan't know where we are, I'm afraid, particularly in the mornings. Still, for all that, good luck to the Convention and its 1894 hosts!

I observe that there is to be an exhibition of photographic apparatus at the Royal Aquarium next September. What a pity the date clashes with that of the Exhibition of the Photographic Society of Great Britain which opens in the same month, and at which the public will have an opportunity of seeing what is really new and novel in photographic apparatus, and not the mere ancient contents of the shop windows, such as most other photographic apparatus exhibitions invariably serve up for our delectation. I do not wish to throw cold water on the Aquarium project, but the promoters would do well to remember that the last exhibition of photographic apparatus held at a place of public entertainment—that, in fact, at the Crystal Palace fourteen months ago—was a failure of the bleakest, dismallest, ghastliest type. Bearing this fact in mind, I should not be surprised if the photographic trade held severely aloof from the Aquarium Exhibition, especially as the last persons in the world for whose benefit it is to be run are the photographic manufacturers and dealers. COSMOS.

MICRO-CHEMICAL METHODS IN PHOTOGRAPHIC RESEARCH.

THE extreme delicacy of many photo-chemical reactions often necessitates some special method of detecting results. In some cases, indeed, accurate knowledge is rendered almost impossible by the failure of ordinary analytical processes when dealing with the subtle molecular changes met with in photographic chemistry. To whatever branch of photography we turn our attention, these difficulties arise to the obstruction of progress, the hindrance of research, and the encouragement of strife amongst rival theorists.

It may be useful, therefore, to bring before the notice of workers in experimental photography some account of the progress which has been made of late years in the application of the microscope to chemical analysis; more especially as it is possible, by this means, to trace chemical changes which are far beyond the reach of ordinary analytical methods, and which even exceed the delicacy of some volumetric processes, without the sacrifice of anything like the time and labour which these involve.

Some ten years ago I first had occasion to make use of the microscope in the examination of certain molecular states of the haloid salts of silver, as well as of the structure of opaque metals; but very little was known at that time of the advantage of the employment of this powerful instrument in quantitative analysis. Since then, however, invaluable work has been done in micro-chemistry by Haushofer, Klément, and Rénard. The band of workers in this new field of research is as yet small, and their results have not so far found their way into chemical laboratories, but these results have quite recently been rendered more accessible by the publication of excellent text-books on the subject.

The power of microscopic tests may be estimated by considering

ıe minimum quantity of a substance which can be recognised by ıis means. According to Behrens, sulphuric acid may be traced to ıe ·00019 part of a milligramme. Silver can be detected in ıantities as small as ·00015 milligramme in drops of liquid no more ıan a cubic millimetre in size, even with moderately low powers of ıe microscope. It must not be supposed, however, that this method ? examination is not attended with difficulties. Some amount of ractice will be required before the results can be recognised with ıcility, and certain reactions are more or less spoilt by the presence f even small admixtures of other substances.

The principle upon which micro-chemistry is based consists in the ddition of certain reagents to minute quantities of the substance to e tested, and the examination under the microscope of characteristic rystals produced by the reaction. So delicate are some of these eactions that it is necessary to renew frequently even the distilled vater kept in glass bottles, on account of the appreciable quantity of lkali and silica which are frequently dissolved even from the ıardest glass.

A few examples of the recognised methods of procedure in certain ases will more clearly illustrate the details of the process. Sodium s a salt which, perhaps, more than any other, enters into photo-ıraphic manipulations, and the extreme solubility of its salts renders ts detection somewhat difficult by ordinary analytical methods. With the microscope it is possible to detect sodium to a limit varying rom ·0008 to ·00004 milligramme. It is advisable to concentrate he liquid to be tested as much as possible on account of the difficulty n obtaining crystallisation in dilute solutions. To a drop of the oncentrated liquid is added a drop of uranyl acetate, dissolved in lilute acetic acid, upon an ordinary glass slip placed beneath the microscope. In a few minutes beautiful light yellow tetrahedral rystals will be developed, consisting of the double acetate of sodium nd uranyl. The shape of the crystals is modified by the formation of triple acetates in the presence of magnesium and certain other substances. Silver salts lend themselves with peculiar facility to this method of examination on account of the ease with which crystals can be obtained by evaporation of an ammoniacal solution of the haloid salts at ordinary temperatures. Cubical crystals, often with octagonal facets, soon develop, and form a ready means of separating silver from other substances. It is advisable to use a power of 300 diameters for the examination of these crystals. The limit of this test is placed by Behrens at ·0001 milligramme of silver, and even this small quantity is broken up into a large number of microscopic crystals of perfect form and symmetry. If it is not convenient to use so high a magnifying power, potassium bichromate may be added to the solution, made slightly acid, when a power of fifty diameters only will be sufficient to watch the growth of large triclinic prisms of brownish-red silver bichromate.

Thallous nitrate forms a beautiful micro-chemical test for gold, capable of reacting with as small a quantity as ·0006 milligramme of gold. A small drop of a solution of gold chloride, containing about one per cent. of gold, is placed on a glass slip beneath the microscope. A minute particle of solid thallous nitrate is placed in the drop, and almost immediately bright yellow needles of thallous chloro-aurate are seen radiating from the particle, and growing rapidly to a length of about ·1 millimetre. A low power is sufficient for this test. Still smaller traces of gold may be detected by placing near a drop of the solution to be tested a drop of mixed stannous and stannic chlorides. The two drops are then made to touch, when a red line at their junction indicates the presence of gold to a limit of ·0002 milligramme.

Platinum is still more readily traced to a limit of ·0006 milligramme by treatment with cupric salt, ammonium chloride, and ammonia in excess. Deep-coloured violet needles of chloroplatinite of cupridiammonium (salt of Millon and Commaille) speedily appear if the dilution does not exceed ·01 per cent. of platinum salt. In stronger solutions it is sufficient to add excess of ammonia, and observe the green needles of the salt of magnus (chloroplatinite of platino-diammonium) which are produced.

Sulphur, in the form of soluble sulphate, is readily detected to the limit of ·00012 milligramme, by means of cæsium chloride and aluminium nitrate, in which reaction colourless octohedra of cæsium alum of great beauty and perfection readily form. If the solution is very dilute—as, for instance, one part of sodium sulphate in 4000 parts of water—acetate of lead may be employed, by means of which an amount of sulphur, as small as ·000006 milligramme, may, with practice, be detected.

These few examples will suffice to indicate the extreme delicacy of micro-chemical reactions. If the solutions are sufficiently concentrated, the reactions become visible at once; but the limit of instantaneous reaction, of course, varies with the solubilities of the crystalline precipitates produced in each case. For this reason the reagents are best employed in dry powders, or, at least, in concentrated solutions.

Although the subject of micro-chemical analysis has so far been studied rather with a view to its use in petrographical and mineralogical research than to its application to general chemistry, it is obvious that its methods are capable of adaptation to extensive use in the photographic laboratory. It is not the object of the present paper to point out where and how it may be most advantageously employed, but one or two instances of its possible utility may be suggested. Let us suppose that a negative shows some local imperfection in the shap of fog, stains, or spots. The treatment of these blemishes with chemical reagents, and the observation beneath the microscope of the crystalline products which are formed, may give sure and valuable information as to the cause and cure of these imperfections, where ordinary chemical methods might fail on account of the minute quantities available for testing. Take, again, the question of impurities in photographic chemicals—a too common source of defect in negatives and prints. In some cases these impurities exist in such minute traces that detection by ordinary analytical methods becomes difficult, if not impossible. The microscope could, without doubt, be advantageously used in this case also, and often with a great saving both of time and expense of cumbrous chemical appliances.

The photographic chemist cannot be too well armed with delicate weapons with which to attack the many and obscure chemical problems which come continually before his notice; and seeing that it is possible, by the aid of the microscope, to deal with traces of dissolved salts of a hundredth, or even, in some cases, a millionth part of a milligramme, it is scarcely extravagant to predict that micro-chemical methods, now quite in their infancy, are destined soon to take a prominent place in qualitative analysis.

J. Vincent Elsden.

THE DENSITY OF THE PHOTOGRAPHIC IMAGE.

There are a few points in the recent editorial article on "The Proportion of Gelatine and Silver in Films," and Mr. Findlay's letter in the same issue, upon which I would like to make a few remarks. I quite agree with the former that films containing a small amount of the silver haloid are deficient in sensitiveness as a rule, but they can be made to give the speed of an ordinary plate, say, of about nineteen or twenty sensitometer. And they will often give the numbers about fourteen or fifteen with greater density than a plate with more silver in it. I often think we make a great mistake in looking upon the speed of the plate solely in regard to the highest sensitometer number that it gives. True, a very rapid plate will give a trace of a deposit with a very weak light, but the slower plate will soon catch it up in the lower numbers, and give a more perfect gradation lower down the scale of the sensitometer, and gives gradation where the more rapid plate has begun a reversal. And my experience is that, give a slow plate sufficient exposure, especially if there are many bright half-tones in the object, and it will produce a far better negative than a very rapid plate, especially on small plates.

I think manufacturers make a great mistake in coating small plates with the same emulsion as they use for, say, 12 × 10 or 15 × 12, because the requirements for artistic results are so different. On the small plates what one requires are dense shadows and bright, sparkling high lights, and the gradation requires to be very pronounced; but, on a large negative, the same density in high lights and relative amount of clear glass in the shadows would look like so much soot and whitewash stuck on the paper, unless it is hung on a wall, where one cannot get within a few yards of it. Looked at in an album, the shadows of the large print would look too black and heavy, and the high lights too chalky.

For large plates I prefer a coarse-grained rapid emulsion, giving little density comparatively, with plenty of detail in the shadows; but for small plates I like to have a slow emulsion, with the finest possible state of subdivision of the particles of silver haloid, with the gradation far lower in the sensitometer scale, giving bright, sparkling density for the high lights of the print. But what is the good of talking? A photographer, seen with a quarter-plate camera with a tripod, would be almost laughed at nowadays. The manufacturer is wise in his generation. He has to make plates of the highest possible speed to fill the hand camera of the amateur with an average of perhaps one good negative from a dozen plates; it would almost ruin him to produce small plates of a slower speed.

The modern amateur is not only far too advanced to be seen with a tripod, but he is too lazy to have to wash and tone his prints before fixing them; he is willing to lump into his hypo bath sulphur, lead, and acid, as well as gold; anything to save himself trouble. Old photographic experimentalists simply stand aside aghast, and think of the old days, when every print represented a large amount of time and care. The ordinary amateur does not know or trouble what his prints will look like in ten years time. Meanwhile the manufacturer hauls in the money, and is satisfied. As to the gradation and quality of negatives, containing a very small amount of silver, I only know this, that one of our leading authorities in England, to whom I showed some negatives about eight or ten years ago, which were prepared with only half a grain of silver nitrate to the quarter-plate, told me that for quality he had never seen them equalled since the days of the collodio-albumen plate, and on a few of the plates which I gave to a friend to take to Norway, and which were exposed on mountainous scenery, on examining the negatives with a magnifying glass patches of snow on the mountains nearly fifty miles away were clearly defined, and the detail was perfect right away from the foreground to that distance.

I remember about that time a vicar friend of mine told me that he had had several photographers to take negatives of the interior of his church, but they had failed, and told him it could not be done, because the windows, with the exception of those in the chancel, were of a yellowish tint. When I tried, I did not hope for much success, because my only chance to get enough light was in the morning, when it was coming through the chancel windows. The rest of the church was so dark, that I had to get a friend to go about with a lighted candle while I was focussing before I could tell how much I had to get on the plate. It was 8.30 a.m. when I exposed the plate, for half an hour, with the bright sunshine streaming through one of the chancel windows, and yet the details in the windows came out splendidly, with only very slight halation, and Messrs. Morgan & Kidd enlarged that quarter-plate negative up to 23 × 17 with capital results. The deposit on those negatives was more like a stain than anything else.

Of course, in those early days of emulsion-making, when plates were coated by hand on a small scale, with the difficulties one had with frilling gelatine and imperfect drying arrangements, it wanted a great deal of enthusiasm to work on to overcome the failures one met with; but now, with plates the price they are, with all those difficulties overcome by the manufacturers (and as one gets older one is inclined to get more lazy), I, like most of the members of the old crew of plate-making experimentalists, have given it up.

I really do not see why people should complain and cry out against the manufacturers, because Messrs. Haddon and Grundy have found that the plates in the market contain such a small amount of silver. Every one acknowledges that there has been a great improvement in the qualities of their plates in the last few years, and, if the results are satisfactory, what does it matter? They have simply found out the fact, the same as I did, that the density and quality of a plate does not depend upon the amount of silver bromide in the film, but in the molecular state of the particles when the emulsion is prepared, or, rather, the method of combining the bromide with the silver. It is no earthly good imagining that, by simply diluting an emulsion with an equal bulk of plain gelatine, so as to reduce the amount of silver bromide per ounce of emulsion, one can get the same results. Working in that way, one gets neither density nor gradation.

There is one point in Mr. Findlay's letter to which I would like to refer, and that is, whether the organic matter in the developer plays only a very secondary part in producing density. I did not refer to the staining of the gelatine by the developer, but to a combination with the reduced silver of organic matter. If he will make some silver bromide in a test tube, and add pyrogallic acid developer, he will find, in addition to the reduced metallic silver, brown organic colouring matter combined with it.

He found by his experiments that the question of density depended upon the sample of gelatine that he used. To a great extent that is so, but how about it when he exposes two plates from the same batch for the same length of time, and develops one of them without any bromide with a strong alkali, and the other with a weak alkali and a strongly restrained developer?

From my experiments I have come to the conclusion that, where different gelatines produce different results as regards density, that it is due to the power that the silver has in combining with the organic matter in them, previous to the double decomposition taking place between the nitrate of silver and, say, bromide of potassium. We obtain similar results with chloride emulsion papers, where there is no free silver left for the organic matter of the gelatine to combine with, and yet one gelatine film will give a totally different-coloured deposit from another.

I believe that in some cases there is organic matter bound up with the bromide of silver particles more than in others, and that this has something to do with the colour of the deposit reduced by the developer; but a question of this kind is far too complicated to go into at present.

HERBERT S. STARNES.

A CHAT ABOUT THE EXHIBITIONS.

(NEW RULES—OFFICIAL RECOGNITION OF ART—COLLABORATION AND MEDALS—INJUSTICE TO LANTERN SLIDES.)

IT will probably be not without interest to a considerable proportion of photographers if I briefly jot down a few remarks upon the changed circumstances under which the forthcoming Exhibition of the Photographic Society of Great Britain will be held.

Already several who mean to make strong running have carefully estimated the personal leanings of the "arbiters of honour," have no less diligently digested the new rules and regulations, and are now hard at work in field or studio, each one pushing "his prudent purpose to resolve."

Although some there are who will haughtily spurn the artificial trammels which the aforesaid allow themselves to be restricted by, and proudly boast that their genius is permitted to roam about "fancy free," and without servile thought of Judges' idiosyncrasies or of general regulations, it is by no means certain that the man who allows himself illimitable scope is the better off of the two.

The loftiest ideas, the most magnificent word-pictures, the rarest pearls of imagination, have always been evolved in a kind of ring fence of rhythm, to which, in some cases, a metaphorical *cheval-de-frise* in the shape of rhyme is added, further accentuating the poet's limitation; and yet—"Ode to the Skylark," bear me witness—it is this very pegging down which has stimulated the great minds of those who are melodious in word to blossom into song. Even so with the camerist. Give him a mastery over every process, let him have the whole world to ransack for subjects and a lifetime to spare for the quest, and you shall see him, like the lion escaped from its cage, bewildered by possibilities, and morally incapable of following up any lead to its ultimate goal of success.

Therefore be rather glad than otherwise if you find the conditions of exhibition set for your observance are rather hard nuts to crack, the needful effort will but serve to brace resolution and concentrate energy upon some definite object, where otherwise your aims might be spread and your photographic results become diluted and disconnected.

There is one innovation which I think most will be thankful for, viz., the following: "Exhibitors who desire to do so may state whether they wish their exhibits to go before the art or the technical Judges, or both."

In the above newly adopted regulations the Council have taken one of the steps towards instituting "Photography in Compartments," which I advocated at last year's Congress. No doubt, if the constitution of the Society permitted, it would, I venture to opine, not be long before a complete and sensible system of classification were adopted; but to draft a sound working measure presupposes a strong, homogeneous, and active committee; unless, indeed, a Napoleon can be found who has the necessary experience, leisure, and, above all, the organizing ability to legislate and the capacity to administer.

In setting up a distinct class for "art," quite disconnected, apparently, from technique, the Society would seem to be solicitous to counteract the falling away of supporters due to the institution of the Salon, whose sole *raison-d'être* is to give full scope and prominence to the pictorial manifestations of the camera, which its founders considered the Pall Mall Exhibition neglected to do. If, therefore, Mr. P. S. G. B. is now really going to amend his old selfish ways; if, instead of being everlastingly shut up in his laboratory, he intends to spare some of his thoughts for Mademoiselle Beaux Arts, the question arises, will the pretty lassie come back again, and make up the quarrel with her ancient wooer? or has she taken on for good and all with those old young men, those photographic Hamlets, garbed in what Tom Hood calls "funereal hackle"?

If so, may the skittish jade lend them a little of her brightness—just enough and no more—or perchance we shall ere long be finding the whole company doffing their sables and transformed into photographic Pierrots.

The truly great, which, of course, applies to all camerists, are always truly thorough, and do not stop at half-way houses, which is why I permit myself to imagine such a possibility as the above

radical conversion from moody to merry. But, in all seriousness, I fully believe that, if we could only clap our disciples of darkness into a room, there to spend an hour or two in listening to the words of those of our young painters who teach the worth of "pictures of light," they would with one accord abjure their past, and henceforth testify by their prints that they do truly worship Old Sol; rather taking for their models the exquisite half-tones and high lights of Sainton's silver points than mezzotints much overcharged with dark and heavy shadows.

A point which is not nominated in the bond, but which none the less fully deserves more than passing attention, is that while the Salon regards its exhibits as the individual expression of an artist—or man—the Photographic Society of Great Britain looks upon each exhibit mainly, if not entirely, as an example of what can be done by photography; in other words, that is if last year's display be a criterion, the Photographic Society of Great Britain has not the least objection to the medalling of a print which is the production of more than one individual. Thus, in 1893, a quarter-plate was taken at Barbadoes and there developed; the photographer then sent it to England, where it was enlarged by another gentleman who exhibited it at the last Pall Mall Show, where the latter was awarded a medal for the enlargement in question. Although there were at the above display a number of other exhibits due to the combined intelligence of two or more individuals, I do not remember that any of the other medalled works were expressly declared to be the result of collaboration. For myself, looking at the matter purely from the standpoint of a society which is first of all photographic, and everything else afterwards, *primâ facie*, I see no particular reason why works of mixed parentage should suffer exclusion from honourable recognition. "The photograph's the thing," and not the glorification of "I did it all myself;" at least, not at such a display as the one under consideration.

Such being the case, it is inexplicable why with a kind of *volte-face* the Society should walk out of its way to specially exclude lantern slides from competition, unless both negative and transparency are the production of the same hand.

Surely what is sauce for the paper positive should be served out to the glass one? Nay, more, if any difference at all were made, it should, in my estimation, be in favour of the lantern slide; for there are comparatively few alike capable of producing negatives of good subject and substance, and also making brilliant and telling transparencies; this not always because the art-pervaded negative is worthless for such a purpose. Unless I am mistaken, Mr. H. P. Robinson has never made a slide, nor, so far as I am aware (unless quite recently), has Mr. G. Davison; anyhow, neither have publicly shown examples of their handiwork in this branch; there are scores of others less known men in the same case. On the other hand, many names must occur to my readers—Mr. Charles Hussey, to wit—of those who, being accomplished slide-makers, are, nevertheless, not distinguished as picture-manufacturers. Is it not, especially in slide-making, distinctly bad policy to discourage a couple of able individuals from joining hands to produce results which may be matchless? Are Gilbert and Sullivan, or Besant and Rice, or the triumvirate who devised the Drury Lane Pantomime, to have no co-ordinates in this particular branch of photographic creation, which is so unusually suited for the combined action of complementary capacities?

A few further dissertations upon other innovations in the new regulations, and also upon matters arising therefrom, are held over.

HECTOR MACLEAN, F.G.S.

ARCHITECTURAL AND GENERAL INTERIOR PHOTOGRAPHY.

[North Middlesex Photographic Society.]

AMONG the various uses to which photography can be, and is, applied, there is one in which it certainly has no superior, perhaps hardly any equal, viz., in the reproduction and delineation of architectural details, a subject requiring all the mathematical exactness it can possibly receive, both as regards correctness of drawing, fineness of detail, and parallelism of lines. To architects, draughtsmen, wood and stone carvers, or, indeed, to any one connected with the planning and construction of buildings, photography must be counted as one of his greatest aids, for now they have at hand correct and reliable reproductions of every notable example of architecture, from the Early Norman and the Grand Renaissance (whose king did so much for this branch of art) down to the most modern work of the present day.

It was Ruskin who said that the greatest service photography could render was the careful reproduction of architecture and its details, from the beginning of the twelfth to the end of the fourteenth century. Such a statement should, and will, certainly stimulate the young student in his work.

From the large and ever-increasing army of camera workers this branch of our art must necessarily claim a strong following, some because their whole souls, so to speak, are wrapped up in architecture, and who can tell you the reason for every frieze or moulding, or the date and period of every spandrel, whilst another section follows it in much the same manner that they do anything else, not for its beauty, for they see none—their usual remarks being confined to, "It's a fine building," and "It must have cost a lot of money"—but because it is a "fine building" and has "cost a lot of money" they photograph it. Besides these, a great many of our photographic workers turn to this branch of photography because they find pictorial landscape work to be above them, and, like the sensible people they are, abandon it; for, while being perhaps successful technical photographers, they perceive that *pictorial* work requires something more than technique, a something meted out to only a few favoured ones. What is the result? By making use of their abilities in the right manner, they become successful where they would have been non-successful—well-known recognised masters where they would perhaps only have been mere photographers.

In architectural work we have the subject before us, and the whole time can therefore be devoted to satisfactorily placing it upon the focussing screen. It may be summed up as purely technical work with a slight knowledge of the artistic.

I would here strongly condemn the indiscriminate use of the camera. It is, unfortunately, the accepted idea with young (and, in many cases, old) workers to always photograph the grand general views, using lenses of the widest possible angle, without the slightest knowledge of how to utilise them properly, prompted, no doubt, by the excellent perspective drawings produced in the various architectural papers. But they very seldom fulfil even their own wish; seldom do we see the whole length of a building satisfactorily photographed. Far better is it to apply the camera as an aid to reproduce typical details and smaller portions of the building, and thus produce work of real good educational power having some practical use. For instance, look what good work Captain Gladstone, R.N., has done for the Lantern Society.

But enough. I have cracked the shell, let us explore the inside in the hope of finding a fruity nut.

In the following paper I shall endeavour to place before you the *modus operandi* in order to produce a good technical negative of an architectural subject, both domestic and ecclesiastical, either interior or exterior. To simplify my task and to facilitate matters, I have divided the paper into the following portions:—

First,—The apparatus required.
Second,—The subjects.
Third,—Focussing and exposing the plate; and,
Fourth,—The development and after-treatment of the negative.

THE APPARATUS REQUIRED.

It is not absolutely necessary, though desirable, to have special apparatus for this class of work. Such a camera, lenses, &c., as you may have will, in the majority of cases, if used with judgment, answer admirably; but, if purchasing with the intention of numbering architecture among your various studies, then it is as well to consider the various points enumerated below.

The camera, which should be of fair size, say not smaller than whole-plate or ten by eight, the latter being more desirable, should be light, rigid, and perfectly parallel in its various parts. To my mind a smaller size will not give a satisfactory rendering of the subject, except it is for lantern slides or enlargement; and, another thing, it is considerably easier to develop a large plate than a small one. Of the two well-known patterns, front and back extension, the former is certainly to be preferred for several reasons, the chief probably being the greater ease in focussing when using a short-focus lens. This will be quickly understood when focussing a dark interior, especially if you are placed in an awkward corner, when the projecting tailboard of the back extension camera is a great nuisance. Another reason is the advantage of a swing front, and, generally, a greater rise of front. The bellows should taper but slightly, and be quite firm, not liable to drop, or bag in the centre. The back of the camera should slide up and down the baseboard as required. The swing back must be very firm, and made to swing from the centre. Rack-and-pinion focussing is to be preferred to a screw, which is at times very much in the way. Rising and cross fronts should be as long as possible, the rise being quite four inches on a 12×10 camera with a corresponding amount of fall. This long rise can be got by placing the lens out of the centre of the front, then bringing a piece on the shortest side which will fold over when the camera is closed up. Bushes will then be required on both sides of the camera front, so that the rising front can be

turned upside down when required (see Diagrams I. and II.). The reversing back is best made so that it will go on all ways; then the shutter of the double back can be drawn from the top, bottom, and both sides. The double backs themselves should slide in with about one inch run, the shutters being hinged all the way down. This will enable them

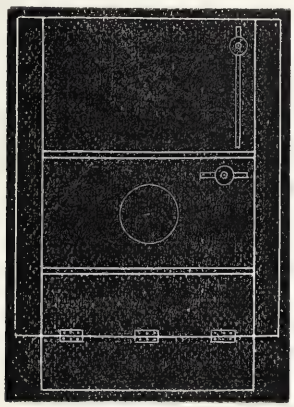


Fig. 1.

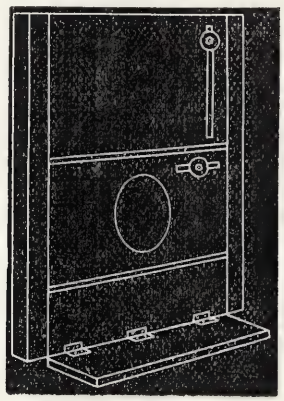


Fig. 2.

to be drawn out even when the camera is placed in a confined position Two levels or plumbs are required, and are best sunk in the camera one at the side about half way up, and the other at the back, placed under the ground-glass frame, special attention being given to purchasing quick moving levels, slow ones being a great disadvantage. To place a check on the levels and assist in adjusting the picture on the screen, the ground glass should be ruled with a finely pointed pencil into inch squares, the lines quite parallel to the sides. Thus a 12×10 piece of glass will contain 120 squares, a 10×8, 80 squares (see Diagram III.).

One word more before leaving the camera. Do not have the bellows fixed on the rising front, or it will be found almost impossible to obtain very much rise; when using a short-focus lens, the bellows will gather in a

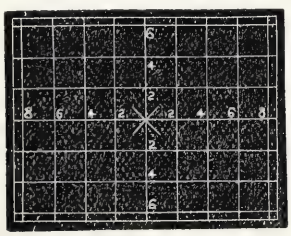
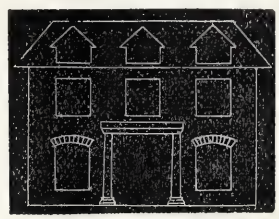


Fig. 3.



Fig, 9.

heap at the top and in all probability throw the camera out of square. The rising and cross fronts should always work independently of the bellows.

Tripod Stand.—It is essential that the tripod stand be of the sliding, leg pattern with a large head. An Ashford is as good as any, and will answer all purposes. It is always well to have three pieces of cloth or cork on which to place the tripod points when you are on marble or polished flooring; attention to this will prevent the use of violent language.

Lenses.—Lenses form an important item in our work, and should be selected with great care; but a good deal will necessarily depend upon the purchaser's pocket. Of the different varieties that we may choose from, the series known as "wide-angle symmetricals" is, perhaps, as good as any. They have great covering qualities, and give splendid definition. Those required, and which will best suit our purpose, are, for whole-plate, one each of five, seven, and nine-inch focus; for a 10×8, one of each of six, eight, and ten-and-a-half-inch focus; and, for 12×10, one each of seven, nine, and twelve-inch focus. Longer-focus lenses are rarely required, the most useful being the middle one of each set. "Portable symmetricals" are also very fine lenses to use, but have not quite so great covering power; that is, a seven inch wide-angle symmetrical will cover a slightly larger plate than a portable symmetrical of the same focus. But the definition of these lenses is remarkably good, and if you have portable symmetricals of, say, six and twelve-inch focus, by placing one combination of each lens together (that is, screwing them in one mount), you will then have a lens of nine-inch focus, thereby practically saving the cost of one lens; in this case, the nine-inch. A suggestion which may be of some use is, that, if possessing a rapid rectilinear lens of short focus, for instance, a 6×5 rapid rectilinear of seven-and-a-half-inch focus, by having constructed an extra tube of shorter length, and screwing the lenses into that, you will find that it will then cover a 10×8 or 12×10 plate, thereby fulfilling similar functions to a wide-angle of that focus. True, such a lens will give a much rounder field, but when it is stopped down to, say, *f*-32 or *f*-45, it will, as a rule, cover equally as well as the much more expensive wide-angle—the difference, in fact, being so very small as to set one thinking whether it is necessary to pay the large sum asked for wide-angle lenses, especially those of large size. The cost of the extra tube is very small—for a half-plate lens, about 5*s*.

When the worker is suited as regards lenses, he should test the quality and merits of each lens, what size plate it will cover, how much rise and slide of front can be got without cutting the corners off, and the best point to focus in order that everything is quite sharp when the lens is stopped down. Wide-angle lenses have a bad habit of altering or lengthening the focus when the aperture of the diaphragm is decreased; this is not noticed when focussing a dark interior, but is pointedly brought home when the plate is developed. All these things should be carefully marked on the camera, so that it is impossible to forget them. A lens shade of the pattern I show you is a valuable addition, and will save much time when arranging the camera if there are any windows at the sides of the building, and it is always very useful in screening top light, and preventing it reaching the surface of the lens.

Plates and Backing.—The question of plates and backing is always interesting, and is a subject on which considerable difference of opinion exists, one man advocating the use of slow plates entirely, while another pins his faith to plates only of the greatest rapidity. The same can be, and is, said of the various backings recommended from time to time in the journals. My own opinion is, that plates of medium rapidity give the best average results, but these should always be supplemented with a few of greater rapidity for very dark subjects. It is as well to remember that a quick plate gives a much softer result than a slow one, and also that backing tends to produce a much harder negative; so much so, that I should allow quite twenty per cent. more exposure when using a backed plate. In the report in The British Journal of Photography of the Newcastle Exhibition, Mr. Bedding, in criticising some architectural work, said that halation had now almost disappeared from Exhibitions. With this expression I quite concur, and put it down, if not directly, indirectly, to the use of backing in some form or other. Of the various



Fig. 10.



Fig. 11.

backings in use, caramel probably heads the list, and I think it has been satisfactorily proved by Mr. Teape that its use does prevent halation; but it has the distinct disadvantage of being messy, and is decidedly obstinate in refusing to dry. Burnt sienna, gum, glycerine, and methylated spirit was another backing I used for a considerable time. It was very good in its way, but possessed the same evil characteristics as the caramel. I now use, and strongly recommend, a backing made by Mawson & Swan. It is flowed on the back of the plate like collodion, sets in a few minutes, and dries very quickly. It is of a ruby-red colour, and in use I find it quite as effectual as burnt sienna, without the latter's drawbacks. To remove the backing, moisten the back of the plate with water, and remove with a scraper, but I find it preferable to leave it on until after development is completed and the plate fixed. Owing to its clear red colour when dry, it is hardly noticed in the dark room, all the details showing well through, and the difficulty in judging of the opacity of the negative is very little. The great utility of this backing is, that a whole batch of plates can be backed, and then repacked in their original boxes without the slightest fear of the backing breaking away and effecting a lodgment on the front of the plate, and thus causing detestable pinholes to detract from an otherwise perfect negative. The cost of this backing is very slight, being less than a penny for a 12×10 plate.

2. *The Subjects.*—The subjects that fall to the lot of an architectural photographer comprise work of the utmost variety and character, and under all conditions of lighting, from the old crypt of a cathedral to the latest marble buildings of the present day—all requiring different treatment. White or light marble and stonework are best photographed in a subdued light, using a quick plate, exposing fully, and then using a developer rather strong in pyro. Such treatment generally gives good

gradations, without that excessive hardness so often met with. In old stonework, such as our old cathedrals, abbeys, and churches, it is advisable to allow the sun to strike at right angles to the lens. This will bring out all the points of the work and give a certain amount of relief. Here we may use a slow or medium plate, and give a very generous exposure, for what is wanted in the negative is briskness and pluck, but not hardness. It is, however, sometimes better to photograph these subjects in a soft or even dull light, and, coupled with a long exposure and careful development, the results are particularly fine. Wide-angle lenses should always be used very carefully in exterior work, especially when the building is not of any length or in sharp perspective, otherwise there is the liability to so distort the image as to make it hardly recognisable. Here I would caution the worker not to attempt too much: Be satisfied with a portion of your subject if it is in a difficult position. Do not attempt to cram the whole of the subject on the plate simply because you have a very wide-angle lens. This is often done, regardless of the perspective. One more point regarding exterior work: *Never* photograph from windows, &c.; *always* from the ground line. I cannot push this point home too strongly, as it is a fault so often met with. It is so

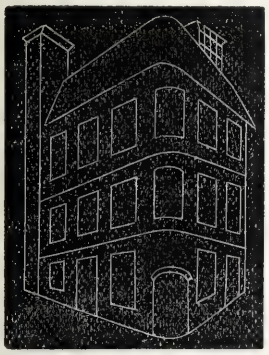


Fig. 12.

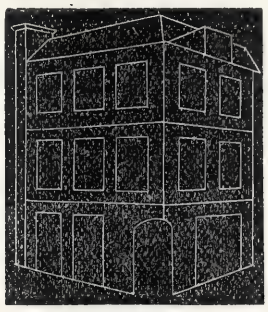


Fig. 13.

easy to photograph from windows, &c., and, of course, saves a lot of trouble to the worker; but the results are most fearful and unpleasant to look upon. Only a few weeks ago I was in conversation with a gentleman very prominently before the photographic world as a leading architectural worker, and he candidly told me that he always got as high up as possible. I was like a certain parrot—said nothing, but thought a lot. Nothing, to my mind, looks worse than a photograph taken from a first or second-floor window, thereby looking over objects ten or twelve feet in height.

Always pay attention, in exterior work, to arranging pleasing perspective on the sides of your subject. Diagrams IX., X., and XI., which you have before you, will explain what I mean.

Diagrams XII. and XIII. will illustrate the distortion given by wide-angle lenses. Fig. 13 is the building as built, fig. 12 the photograph of it, using a seven-inch lens on a 12 × 10 plate.

John H. Avery.

(To be continued.)

Our Editorial Table.

The Picture Magazine for June (George Newnes, Limited) contains six of Mr. H. P. Robinson's photographs, respectively *Primrose Time*, *A Chat with the Keeper*, *Lady Mary*, *His Own Fireside*, *A Visitor to the Hall*, and *Her Ancestor*. The effect is, in our estimation, not improved by the few words of commendation, savouring of toadyism, printed beneath each. Mr. Robinson's pictures can afford to stand on their own merits—"Good wine needs no bush." This number contains also the usual number of portraits, *genre* subjects, and reproductions from the days of long ago.

The Strand Magazine for this month has, as its "Illustrated Interview," one with Sir Francis and Lady Jeune, written by Harry How, Elliott & Fry furnishing the portraits, as well as those of the domestic pets, and the residence. Mrs. M. Griffith sends an agreeable account of the Queen's yacht, *Victoria and Albert*, which is illustrated by West & Son, Symonds & Co., and others. Among the "Portraits of Celebrities" at different times of their lives are some of Sir Charles Tupper, Dr. Leitner, Madame Canziani, and Sir John Astley.

The new Catalogue of C. C. Vevers, Leeds, contains several novelties not found in his previous one. On turning over the leaves, we find that it is copiously illustrated by various pieces of apparatus, such as stand cameras, tripods, copying and hand cameras, exposure meters, instantaneous shutters, camera cases, view-finders, dark-room lamps, and washing tanks. Of course, dry plates, printing papers of various kinds, and lenses by various makers are catalogued, together with mounts, albums, and the other things required by photographers.

Cadett & Neal's Exposure Meter is in the form of a card for carrying in the waistcoat pocket. It is really Dibdin's automatic meter, but it has been adapted to the speed numbers of the plates made by this firm. It is simplicity itself, and for photographers who employ the Cadett plates useful points will be gained by an occasional consultation of this card.

History of the World's Columbian Exposition.

The last of the numbers of this work, and that which contains the general index, has been received by us. If we are to accept this as a sample of the other numbers, we are bound to say that the completed work must form an invaluable history of the great enterprise. The typography, style, paper, and photographs are all on a scale never previously attempted. The excellence of the portraits of the various officials here to be found is undoubted, and reflects high credit upon the portraitist. That of several of the buildings is somewhat marred by the number of those who *will* always persist in staring into the camera during exposure; and, knowing the difficulty of eliminating this source of evil, we sympathise with the poor artist, who has otherwise done well. The work is published by the Columbian History Company, Chicago, and may be obtained in this country from Simpkin, Marshall, Hamilton, Kent, & Co., of London.

News and Notes.

Messrs. Curtis Brothers, of 10, Suffolk-street, Dublin, have been appointed sole agents for the Birmingham Photographic Company's specialities.

Emery's "Premier" Retouching Medium.—Mr. Wilfred Emery, of 24, South-street, Baker-street, has sent us a sample of his "Premier" retouching medium. The instructions for use are to slightly moisten a soft piece of rag with the medium, and rub with a circular motion the parts of the negative to be retouched. This will give a suitable surface. The medium is suitable for working either on the film or varnish. It appears to answer well the purposes for which it is intended.

Messrs. Fuerst Brothers write that they have made arrangements with one of the largest London smelting works to supply them exclusively with their nitrate of silver, and that in this way manufacturers of photographic plates, papers, &c., and users of nitrate of silver generally will be able to obtain a perfectly pure and uniform quality at the lowest market price, based on the value of best standard silver. In a very short time they are to introduce their own brand of chloride of gold and such other manufactures of gold and silver as are of importance to the trade.

The Eastman Photographic Materials Company write: "It will probably interest you to know that we have been fortunate enough to obtain the services of Mr. Harold Senier, F.I.C., F.C.S., as manager of our factory at Harrow. Mr. Senier has worked in photography for twenty years, and has an intimate knowledge of all the processes, including the wet process. He was one of the first film-workers, and has used all the different processes of printing. He is a member of the Photographic Society of Great Britain, Fellow of the Institute of the Chemists of Great Britain (one of the original members), Fellow of the Chemical Society of London, and considered one of the finest analytical chemists."

Herefordshire Photographic Society.—The following are the newly-elected officers:— *President:* Alderman F. Blake, J.P.—*Vice-Presidents:* Messrs. A. Watkins, T. J. Salwey, J. Parker, C.E., M. Wilson, and Rev. G. H. Morgan.—*Council:* Messrs. T. Smith, A.C.A., E. G. Davies, E. W. H. Chave, A. C. Edwards, A. E. Elliott, E. Pilley, R. Clarke, C. E. Woodhouse, E. Stephens, E. Horth, and A. C. Slatter.—*Hon. Treasurer:* W. E. Haines, High Town, Hereford.—*Hon. Secretary:* Cecil Gethen, 9, St. Nicholas-street, Hereford. Regular meetings are held on the first Tuesday in each month during winter at 7.30 p.m. Outings on the first Thursday in the month during season. Annual meeting, October. The number of members is eighty.

Central Photographic Club.—The Committee of the Club have decided to suspend the special weekly meetings during the months of June, July, and August. During the summer months a number of Social Outings will be arranged for. The first of these has been arranged to take place at Leatherhead, on Saturday, June 16, under the direction of Messrs. T. Sebastian Davis and W. F. Slater. Special arrangements have been made with the London and South-Western Railway for the issue of special tickets, to enable members and their friends to travel at the reduced rate of 1*s.* 6*d.* return, instead of 2*s.* 10*d.* The train will leave Waterloo at forty minutes past two

p.m. The Railway Company reserves a carriage both ways. A group of those attending the outing will be taken at half-past six. The arrangements for tea, which is fixed for seven p.m., will be made known at the time of starting. Ladies are specially invited to attend the Club's Social Outings. Members can, if they so desire, take their cameras, but it is not imperative that they should do so. The train leaves Leatherhead at forty minutes past eight p.m. Members and friends will oblige by making early application for tickets at the Club-rooms or to Mr. W. F. Slater, 169, Southampton-street, Camberwell, S.E., to enable all necessary arrangements for the comfort of the members and their friends to be completed beforehand. The frequency of the Social Outings will depend upon the success attending the first of them. On the next Friday evening following the Outing a demonstration of the development of the different brands of plates used with different developers will take place in the dark room of the Club. By the kindness of one of the members, the foreign photographic journals will in future be available for consultation at the Club-rooms. A fresh arrangement has been made with regard to the exhibition of pictures at the Club, by which some of the works by the leading members will constantly be on view, some of them being changed each week. Messrs. Avery and James have undertaken the hanging and arrangement of the pictures. The Club is open from eleven a.m., with an attendant in charge, from whom information can be obtained. The Committee asks the co-operation of the members with the view of bringing the Club under the notice of their friends, so that our membership may be greatly enlarged. Hypo is provided for the members' use, free, in the Club-room.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
18	Leeds Photo. Society	*Printing*: Silver, Godfrey Bingley; Platinum, T. W. Thornton. *Mounting and Framing.* J.C S.Mummery.
18	North Middlesex	
18	Richmond	
18	South London	*Photographic Experiences.* Thomas Fall.
19	Ashton-under-Lyne	Excursion; Mobberley. Leader, S. Sharp.
19	Birmingham Photo. Society	
19	Brixton and Clapham	*Notes on Pictorial Work with Hand and Stand Cameras.* W. Thomas.
19	Hackney	Carbon Demonstration. Birt Acres.
19	Hastings and St. Leonards	
19	North London	
19	Paisley	
19	Rochester	
19	West London	
20	Bury	
20	Leytonstone	
20	Photographic Club	Recent Printing Processes.
20	Southport	
20	Southsea	
21	Birmingham Photo. Society	
21	Glossop Dale	
21	Hull	
21	London and Provincial	
21	Oldham	
21	Oxford Photo. Society	
21	Woodford	*Hand Cameras.* Henry Crouch.
22	Cardiff	
22	Croydon Microscopical	
22	Holborn	
22	Maidstone	
23	Croydon Camera Club	Eleventh Excursion, to Caterham, leaves East Croydon at 2.47. Leader, G. R. White.
23	Croydon Microscopical	Exc.: Warlingham and Worms Heath.
23	Hull	
23	Leytonstone	Excursion: Zoological Gardens. Special Ladies' Day. Leader, J. H. Barrat.
23	Liverpool Amateur	Excursion: Rhydymwyn and the Alyn Valley. Leader, Dr. Ellis.
23	Oldham	Exc.: Rossett and Gresford. Leader, W. Thompson.
23	South London	Excursion: Hayes and Keston. Leader, Mr. Grigg.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JUNE 12,—Ordinary Meeting, Mr. J. Spiller (Vice-President) in the chair.

The following gentlemen were elected menmbers of the Society:—Messrs. F. K Hurman, P. L. Waterlow, G. Inskip, Major J. D. Lysaght, J. D. Geddes, and C. F. Townsend.

The following Societies were admitted to Affiliation:—The Oxford Camera Club and the Erith Photographic Society.

PROFESSOR MARSHALL WARD then read a paper on *The Action of Light on Bacteria.* After remarking on the many different kinds of microbes or bacteria that there were, and pointing out their extremely rapid growth, he said that the reason they did not all live was that they could not stand the sunshine. A drop of water, containing several millions of rod-shaped microbes, if mixed with a film of gelatine, and the plate culture left in the dark at a temperature of 30° Centigrade, would allow the germs to multiply at almost incalculable rate. Having observed that a slide of such colonies, if kept in sunlight, prevented the growth of the germs, the Professor pointed out how he had confirmed the observation by covering up the whole of the gelatine plate and leaving a stencilled-letter space open, by which means clear images of the letters were obtained on the plate cultures. The plates were exposed over a mirror, the gelatine being soluble at 27° Centigrade, and, as the spores would stand boiling at a considerably higher temperature than that, there was no question of temperature in the destruction of the germs by sunlight. Coming to the question as to whether the action of the light on the gelatine made the latter a bad food-producer for the germs, or, in other words, poisoned them, Professor Ward then described some experiments, showing that the figures of the letters were actually formed in a layer of the plain germs themselves, proving that the light action was not on the gelatine, but on the germs. The next point was, what part of the spectrum the action was due to. Spectroscopically tested glasses were used, and it was found that behind a blue glass an image of the letter was obtained in two hours, whereas behind red and yellow no trace of the lettering was seen. Spectra were broken up by cupric sulphate and potassium bichromate, and the results confirmed. Experiments in projecting the spectrum itself on to the films were also described and illustrated, and the arc light also utilised through quartz and glass. The experiments mentioned had dealt with the anthrax bacillus, but on other bacilli of light as light the blue rays were found effective. The blue rays in winter were found to kill bacilli, as well as the light from a blue sky. Professor Ward concluded his lecture (which was illustrated by many lantern slides) by exhibiting a photograph on a plate of germs obtained by printing through a negative.

The CHAIRMAN said the lecture was a very interesting development of photography, and referred to some experiments described at the last meeting of the British Association as to chlorophyll being subject to the effect of the bleaching action of light.

Mr. ANDREW PRINGLE said that Professor Marshall Ward need not be ashamed of the fact that the positive on the plate of bacteria he had shown was not sharp. He might send it to the next Exhibition of the Dudley Gallery Salon. Having complimented the Professor on the scientific interest and excellence of his lecture, Mr. Pringle concluded by commenting on the fact that in such experiments bacteria knew that the blue end of the spectrum was bad for them, and so made tracks for the red end.

Mr. J. CADETT viewed with alarm the possibility of silver salts being replaced by a new material in plate-making.

After other remarks by Mr. H. A. Lawrance and the Chairman, a vote of thanks was passed to Professor Marshall Ward for his lecture.

THE DEVELOPMENT OF PRINTING-OUT PAPERS.

Mr. W. J. WILSON, F.C.S., addressed the meeting on this subject, and, having referred to the attempts previovsly made to develop weakly printed gelatino-chloride prints by acid development, said that method was preferable to alkaline development, which reduced the chloride and other salts of silver. In the method he now described and demonstrated this latter disadvantage was overcome by converting the salts into silver bromide. In the manipulation of the paper he recommended the use of a yellow light, and said that practically the exposure might range between twenty seconds and as many minutes. The bromising solution could be applied for between one and ten minutes, and should not be too strong, otherwise it would have a solvent effect on the gelatine. Any bubbles that formed on the surface of the prints could be got rid of by withdrawing the print, surface down, in contact with the sides of the dish. The developer recommended consisted of—

Hydroquinone	3 grains.
Soda sulphite	4½ ,,
Potassium bromide	6½ ,,
Ammonium carbonate	6 ,,
Caustic soda	6 ,,

per ounce of solution. Having discussed the action of the various ingredients of the developer, Mr. Wilson passed round prints and opals in various stages of development, also partly developed prints in comparison with others fully printed out, as well as prints illustrating effects produced by developer modifications. For toning after development, he had found nothing better than the sulphocyanide bath. He showed a very thin negative, from which he obtained the best results by partly printing and subsequent development. By this process the invisible details of the partly printed proofs were rendered visible by development.

Owing to the lateness of the hour, the demonstration and paper had to be hurried through, and, after a vote of thanks had been passed to Mr. Wilson, it was agreed to resume the subject at the next technical meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 31,—Mr. C. H. Oakden in the chair.

Mr. A. J. BROWN proposed that the resolution of April 5 be expunged in so far as it related to Mr. W. E. Debenham. The Association had not been justified in the course taken.

Mr. J. WEIR BROWN seconded the proposition, remarking that he did not think there was any evidence connecting Mr. Debenham with the matter.

The proposition, on being put to the meeting, was carried *nem. con.*

JUNE 7,—Mr. P. Everitt in the chair.

DEVELOPERS.

A discussion on developers took place, initiated by Mr. A. L. HENDERSON, who stated that he had recently been experimenting with developers, and would shortly produce one that would bring out more detail than any other developer he had used. He mentioned some experiments in proof of its powers.

Mr. J. E. HODD alluded to the extraordinary degree of intensity obtainable with "Velox." It brings the image up at once, giving the negatives a pyro-soda colour.

Mr. W. D. WELFORD had found Velox the best developer for snap-shots, it giving both density and detail rapidly. He had tried it against washing soda and pyro, and found it better than the latter. He thought that of all the modern developers nothing equalled Velox. He had developed about 450 exposures on various makes of plates and films with Velox with good results. Although diluted, the image appeared just as quickly as if the developer were used as recommended (equal parts).

Mr. HODD had obtained good results by commencing development with pyro-ammonia and finishing with Velox.

Mr. J. S. TEAPE had recently started development of a bromide enlargement with Thomas's hydroquinone developer, and, finding after a quarter of an hour that he got no image, added one grain per ounce of amidol to the developer, when the enlargement flashed up instantly, fully exposed.

Mr. HENDERSON, in using the hydroquinone developer, started with an old solution first, then placed the plate in a fresh solution. So soon as the image commenced to appear, he replaced the plate in an old solution. By this method he thought a great deal more was got out of the plate.

Mr. R. BECKETT spoke in favour of amidol, stating that, in his opinion, bromide paper required less exposure with it than with other developers.

Mr. HENDERSON, as regards rapidity of development, said that the quicker the developer the clearer the shadows of the negative would be.

Mr. WELFORD remarked that, using Velox, he found it soon reached a certain stage, beyond which development could not be carried. In his opinion, Velox was a good automatic developer, which could be used in the dark.

Mr. THOMAS BEDDING had recently used Velox for developing transparencies on Wratten's ordinary plates, and did not find that it possessed any advantage over pyro-soda, or that its action was as rapid as previous speakers had stated.

Mr. R. CHILD BAYLEY'S experience of Velox confirmed the latter point.

After further discussion on this subject, it was arranged that, on the 21st inst., several members should develop exposed strips of plates with various developers as a kind of developer test.

RESIGNATION OF MR. FRESHWATER.

Mr. T. E. FRESHWATER informed the meeting that he proposed to resign the Secretaryship of the Association at the forthcoming annual meeting. He said that in future he would be compelled to devote more time to business matters. He had informed the Committee months ago that he would be unable to undertake a second year's office, and he now wished to state that his resignation was in no way connected with recent events in the Association.

The CHAIRMAN, on behalf of the members, expressed regret at Mr. Freshwater's resignation, and thanked him for his services to the Association.

PHOTOGRAPHIC CLUB.

JUNE 6,—Mr. J. Bulbeck in the chair.

PHOTOGRAVURE.

Mr. H. WILMER gave a paper and demonstration of *Photogravure*.

Mr. WILMER first read his paper, which was profusely illustrated with the negatives, copper plates, and resulting proofs, and the demonstration was then proceeded with.

First a chalk paste was made up, and, with a wad of cotton-wool, the paste was rubbed on to the copper plate with a circular motion. The paste was then rubbed off with a fresh wad of wool. Next the "graining," the plate being placed on a slab of glass and slid into the graining box. This box revolved, and was longer on the sides (*i.e.* not a cube), and contained about half a pound of powdered bitumen. The plate was allowed three and a half minutes in this box. Upon examination, the grain was not sufficient; so, after reagitating the box, the plate was replaced, and allowed to remain another two minutes.

The question being asked if powdered resin was used in the same manner,

Mr. Wilmer answered, "Yes," but, being a heavy powder, required longer graining, and in the "heating" greater care had to be used, it melting at a much lower temperature.

Questioned as to coarseness of grain, Mr. WILMER said that, if the box, after agitation, was allowed to remain at rest, say, for fifteen seconds, then reagitated and resting again for a minute, the result would be that the coarser grains or particles would be removed.

Proceeding with the demonstration, the plate was fixed in a pin vice, and moved over a spirit flame until it attained a "bluey-grey" tone. The "lining," or putting a margin round the picture, was then done with a black varnish, an ordinary ruling pen, and a brush. First a line is to be drawn with the pen, and afterwards the margin filled in with the brush.

The temperature of etching solution was then tested with a Beaume hydrometer.

Mr. Wilmer said that at this point the great thing to avoid was the rising of "devils," which he described as minute black spots. One thing to bear in mind was the time from the commencement of etching, a printing plate not being obtainable under ten to twelve minutes. After each solution was poured off, the plate was hurriedly shown to indicate the effect produced. After the final etch, the plate was washed with plain water, then cleaned with a wad of wool saturated with benzole, this taking off the margins and backing of black varnish, and removing the grain; then another clean up with methylated spirit, and finally a rubbing with whitening, this latter to be very carefully done, as it rubs down the picture.

The finished plate was passed round, and, in the opinion of practical workers, was considered to be a very successful one.

Brixton and Clapham Camera Club.—June 5.—Mr. W. Thomas read a paper on *Pictorial Results with Hand Cameras*. The same gentleman will, on Tuesday, June 19, read a paper on *Pictorial Results with Stand Cameras*.

Hackney Photographic Society.—June 5, Mr. R. Beckett presiding.—Mr. ROOFE gave report of excursion to Enfield on previous Saturday. The weather had been unfavourable to photography, but a pleasant afternoon had been spent. Mr. THOMAS FALL, on behalf of the Central Photographic Club, invited this Society, with the South London, to take part in the first excursion of the Central Club to Leatherhead on June 16. It was decided that the Hackney Society's excursion to Broxbourne, fixed for June 16, should be postponed until the 23rd, and that the Central Club's invitation be accepted. Mr. J. Westcott was elected member. Members' work was shown by Messrs. S. J. Beckett, Grant, Guest, Gosling, and Westcott. Mr. HENSLER said he had heard that giving exposed plates a preliminary bath in hypo solution (one in 2000) before developing was a good way for bringing up detail in snap-shots. He inquired if any members had experience of this. In reply, several members spoke of the accelerating action of hypo in ferrous oxalate, but had no knowledge of its effect in other developers. Mr. THOMAS FALL then entertained the meeting with some of his experiences, commencing from the time when, many years ago, he first started photography. His purchase of an advertised camera and set, ready-made developer, and a few minutes' instruction, his first negative, and, in common with all beginners, his delight therewith, were all described. Then followed amusing anecdotes of his first professional experiences. In those days photographers were few, and could command good prices. Mr. Fall did not believe in cutting down the latter; he considered that, if a good price were charged, the work was better valued. Above all things, he thought that a professional photographer should possess tact, particularly nowadays, when people were so exacting. It was this characteristic of the time that made portrait photography increasingly difficult. Sitters knew, or fancied they knew, something about photography, or, if they did not, they generally had friends who did, and the consequence was that their demands and requirements were often carried to absurd lengths. There was no remedy for this but tact. Mr. Fall related some experiences of his own illustrating this. Speaking of the old processes, he mentioned the pleasure he had always felt in developing the wet-plate negatives, there was so much control over results. He showed some very fine old waxed-paper negatives, and also a collection of modern photographs, the work of himself and others. Speaking generally against retouching, he showed comparative examples in retouched and untouched prints, showing how this practice is abused.

South London Photographic Society.—June 4.—The HON. SECRETARY (Mr. C. H. Oakden) gave an address on *Art Photography and the late O. G. Rejlander*, illustrated by a series of lantern slides of Mr. Rejlander's works.

Rotherham Photographic Society.—June 5, Mr. J. Leadbeater presiding.—Two members and one hon. member were elected. An excursion to Eyam, Derbyshire, was fixed for the end of the month. The CHAIRMAN gave some hints on the successful working of albumenised paper. Mr. W. H. SHEPHARD (Financial Secretary) demonstrated with success the carbon process of printing. Samples of tissue had been received from Messrs. Elliott & Sons, and the same firm and the Autotype Company furnished printed instructions.

Sheffield Photographic Society.—June 5, Mr. Ernest Beck in the chair.—Mr. SPARHAM CAMP proposed a week's excursion around the Norfolk Broads in the latter part of July or early in August, which was very favourably received by the members present, after which Mr. C. W. CROWDER read a paper on *Art in Relation to Photography*, which vexed question was rendered by him on a broad basis and in a genial and humorous manner, and was the incentive to a very lively and instructive discussion by Messrs. Firth, Tomlinson, Chesterman, Beck, &c.

Cape Town Photographic Club.—At the monthly meeting of the Photographic Club Mr. WIGNALL gave a very interesting description of *Ether Saturators*. They are now quite superseding the oxyhydrogen limelight, and are being used for all the Exhibitions at Y. M. C. A. and other places in town. Only one gas is used for producing the light, viz., oxygen. One stream of this is passed through an instrument called a saturator, which is packed tightly with a material saturated with ether. This stream is mixed near the nozzle with a stream of pure oxygen, which renders the lime incandescent, and the result is a light quite equal to the oxyhydrogen, without the attendant danger of the mixed gases. Now and then a small report may be heard with the ethoxo light, but this is simply caused by clearing the nipple, and is absolutely free from danger. After the explosion which took place some couple of years ago at the Y. M. C. A., when the oxyhydrogen light was being used, it is reassuring to know that the Exhibitions now being given are not attended with any risk of another such accident. Mr. D. C. Andrew, who has lately returned to Cape Town, brought back a large number of lantern slides of places he visited during his tour, embracing many exceptionally fine views of Japan; these were exhibited to the members of the Club at the monthly meeting, and were so much admired that, at the earnest request of the members, he consented to give a public exhibition of them at an early date. The Club does not make very much public stir in the city, but does a lot of useful work; it has a membership of eighty, and the Council have just arranged for a series of six technical lectures on *Photographic Chemistry*. These are to be given fortnightly, in the dining-hall of the Y. M. C. A., by Mr. C. Ray-Woods, of the Royal Observatory, who is a trained teacher of chemistry. This course of lectures is thrown open at a nominal fee to the general public. On Whit Monday a field day was arranged, a number of members proceeding by the early train to Stellenbosch, where they were met by Professor Logeman (a member of the Club). After several photographs had been taken in the town, the party proceeded up Eerste River in the direction of Jonker's Hoek, getting some charming little bits of river scenery; and in the afternoon a visit to Papacaisberg gave a magnificent view of the town, with its grand mountains in the background. Altogether a most enjoyable day was spent, the party returning by special train, and reaching town by eight o'clock.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.

Sept. 24–Nov. 14 ... Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.

Oct. 1–Nov. 3 ..... Photographic Salon. Alfred Maskell, Hon. Secretary.

November 20–22..... Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,915.—"Improvements in Cameras." Complete specification. T. M. Clark.—*Dated June*, 1894.

No. 11,094.—"Improvements in Photographic Cameras." M. A. Weir.—*Dated June*, 1894.

No. 11,166.—"An Improved Process of Photo-engraving." R. Sanson-Grimoin.—*Dated June*, 1894.

No. 11,200.—"Trimming, Rebating, and Bevelling Plane and Shoot Board for Photo-engraved, Electrotyped, or Stereotyped Plates of Zinc, Copper, Brass, or other Metals, and Wood Blocks." A. W. Penrose.—*Dated June*, 1894.

PATENTS COMPLETED.

Improvements in or connected with the Preservation of Photographs Produced on Slate for Decorative or Artistic Purposes.

No. 10,685. William Jones and Hugh Jones, Garth, Bangor, North Wales.—*April* 28, 1894.

This invention has for its objects the rendering of photographs produced on slate for decorative or artistic purposes impregnable to damp and atmospheric influences, whereby the photographs keep their distinctness much longer.

We carry out our invention as follows :—

The part of the slate upon which the photograph is to be produced is first of all enamelled white or tinted by a process of slate-enamelling. The photograph is then produced on the white or tinted part by the ordinary process of photography. When the photograph is so produced it is then enamelled, being covered with a very thin coating of very pale polishing copal varnish. The slate is placed in a stove, and subjected to about 170° of heat, after which the photograph is polished by being rubbed with very soft rotten-stone.

What is claimed is: The process of producing photographs on slate by first enamelling the slate a white or tinted colour, then producing the image or the like by photography upon the surface of the enamelled slate, then enamelling the photograph by a covering of pale polishing varnish, which is heated and dried in a suitable stove, and afterwards polished, substantially as and for the purpose described.

Improvements in Photographic Cameras.

No. 11,212. John Featherstonehaugh Parsons, Siddington House, Kingsdown Parade, Bristol.—*May* 5, 1894.

This invention relates to film-carrying photographic cameras.

According to this invention, the films are made up in packs, with separate intervening backing cards, or stiffening pieces, of special form, and made of vulcanite, celluloid, or other suitable substance, there being one such backing card or stiffening piece behind each film.

Under one form of construction, the backing cards have vertical ribs or corrugations extending rearward, and situated at intervals between the sides of the cards, and keeping the films at a definite distance apart. The combined pack of films and backing cards stands on a shelf provided therefor in the camera. As is usual in film-carrying cameras, the pack tends to advance towards the lens by the action of a spring compressed behind the pack.

Between the front end of the shelf for the pack and the rear end of the top of the dark chamber is an aperture extending across the camera. Over this aperture is presented the leading film and its backing card, both of which are prevented from dropping through the said aperture by the action of the spring behind the pack, which spring causes the leading film to be pressed at foot against the top of the cover of the dark chamber, the top of the cover projecting above the top of the shelf on which the pack is placed.

At the sides the leading film bears against fixed stops, and at the top against a hooked holder extending along the top, and recessed at points corresponding to the ribs of the backing cards. The holder is attached at each end to a flat arm, which is extended down in a groove provided in the wall of the camera. The grooves are covered in by plates slotted to permit the holder to travel vertically. The flat arms aforesaid are connected at their lower ends by a cross plate, which the bottom of the camera is grooved to receive. Below the shelf on which the pack of films and backing cards is placed is a ledge, to which is fixed a spring bearing towards its free end against a plate fitting the dark chamber, and capable of being moved therein. Against the opposite face of this plate bears one end of a spiral or other suitable spring.

When, after an exposure has been made, it is required to remove the film on which the photograph has been taken and the backing card behind it, the cross plate at the camera bottom is drawn down by the operator, and, the hooked holder being thus brought down on the top of the film and its backing card, they are pulled down below the top of the dark chamber, and are pinched between the spring situated below the pack shelf and the plate above indicated as being acted upon on each face by springs. The ribs or corrugations of the backing cards maintain the films at such a distance apart as to prevent more than one—the exposed—film from being pulled down at one and the same time. A film and backing card having been drawn down as above described, they are, by the action of the spring below the pack shelf, forced forward in the dark chamber, the said spring overcoming the slight resistance of the spring situated in advance of the movable plate. The holder, when fully lowered, still projects above the pack shelf, and acts as a temporary check to the advance over the aperture aforesaid of the next film in succession. When the holder is pushed up to its full height, the next film and its backing card spring forward into the holder, the back part of which is shorter than the front. The sides of the film are brought to bear against the side stops, and the bottom against the top of the dark chamber, which top projects above the level of the pack shelf.

Instead of being provided with a series of hollow ribs or corrugations, as above described, the backing cards may have solid ribs or projections, or one central rib or projection, or they may be otherwise shaped to effect the desired object, namely, to maintain the films at such a distance apart as to obviate drawing down more than the leading film at one time.

An Appliance for Washing Photographic Plates and Prints.

No. 12,734. William Thomson, Royal Institution Laboratory, Princess-street, Manchester.—*May* 5, 1894.

My invention consists of an appliance for washing photographic plates and prints by a constant stream of water, by which the pollution of the water surrounding completely, or nearly completely, washed plates by the introduction of unwashed ones (as happens with the washing arrangements commonly in use at present) is prevented.

My appliance is made by dividing a box made of zinc, tin, tinned copper, pewter, or other material, into separate watertight compartments or chambers by means of sheets of the same or other material, soldered or fixed watertight along the sides and bottom of the box. Each of these chambers is again divided by another partition, which may be fixed or soldered down the side, but which must not quite reach to the bottom of the box, but is left open (by preference from one-eighth to one quarter of an inch). I do not, however, limit myself to any special size of opening, the object being to allow the water to flow down one side of the partition, pass under it, and rise on the other side. The partitions which do not go to the bottom I make by preference movable, so that they can be employed for lifting the plates out of the chamber. This I accomplish by making a projection or projections from each side of the bottom part of the movable partition upon which the photographic plates rest. I also arrange V-shaped pieces of metal or other material, fixed at their apices down each side of the chamber (which may or may not go to the bottom), four in each chamber, arranged two in each of the opposite sides of the box, and on each side of the movable position, to act as slides for the photographic plates. It will thus be seen that the plates may be dropped at once between the V-shaped pieces on each side of the movable partition without trouble, and they may be lifted by simply raising the movable partition, which is made higher than the fixed partition for the sake of convenience in taking hold of it.

The top of each of the fixed partitions is arranged on a lower level than the previous one, so as to allow the water to flow from one chamber into the other in a series of waterfalls.

The water flows from a tube (preferably fixed near the top in the back of the appliance, and attached by means of an indiarubber tube to the water tap) down one side of the movable partition of the first chamber and up the other side, falling over the first fixed partition into the second chamber, and so on through all the chambers to the last, from which it is run off by a projecting tube above the level of the last plate.

To prevent the first chamber from being deeper than the last, I arrange the bottom to slope downwards from the former, the highest partition being by preference about an inch and a half above the last or lowest partition.

Instead of V-shaped pieces separately fixed in each chamber, I claim that crimped sides may be soldered or fixed on in such a manner that one V or crimp will answer the purpose of a slide for the movable partition, whilst the adjoining V's on each side of the movable partition act as slides for the photographic plates.

I also claim that the two sides of the box itself may be crimped in a similar manner to answer the purpose of the separate V-shaped or crimped piece above mentioned.

None of the partitions are higher than the sides of the box.

A Combined Spring-catch and Lock for Photographic Dark Slides.

No. 21,127. Alfred Joseph Dewey, High-street, Sidcup, Kent.—*May* 5, 1894.

My invention consists of an improved spring and catch for the shutter of a photographic dark slide, that is constructed in such a way that the spring acts as a fastening or catch before the plate is exposed, and automatically as a lock after exposure, thus preventing exposing the same plate more than once; but, in the event of not exposing the plate, the spring can be reset while the slide is in the camera.

The following is how I purpose to construct the spring and catch and carry out my invention :—

The spring consists of a piece of sheet hard brass steel or other suitable material, preferably hard brass, into which holes are made for fixing to the dark slide, and one end has a slot cut in it or is left projecting for the catch hereafter described.

The spring is fastened to the dark slide, preferably on the top.

The catch is made with a taper or bevelled top and a shoulder each side; this is fixed to the dark slide in such a place so that the slot or projecting end of the spring before mentioned will catch under the shoulder of the catch.

To use this invention, set the spring by keeping it pressed close to the shutter, when it is pressed home; it now acts as a fastening, which, when the spring is released by pulling the shutter out automatically, places itself in a position to spring the other side of the catch, and so forms a lock, as it cannot now be released in the usual way.

When it is desired to open the shutter of the dark slide, it can be unlocked by inserting the thumb or suitable key under the spring until it will pass the catch.

What I claim is an improvement in the spring catch or fastening for photographic dark slides, constructed so that it will automatically lock the shutter and prevent exposing the same plate more than once.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

REVERSED NEGATIVES FOR CARBON PRINTING.

To the EDITOR.

SIR,—A few weeks ago, in article by your well-known contributor Mr. T. N. Armstrong, it was recommended that negatives for purposes requiring reversal should be taken through the glass plate, and various correspondents have since pointed out the disadvantages of the practice, which seem to be confirmed by the fact. that most practical workers prefer to use more or less expensive mirrors and other appliances to secure the accuracy of result needed for their work. Little has, however, been said about a more common want until the letter of "G. N. F.," in your issue of the 1st instant, which asks for a simple way of obtaining reversals from negatives of the ordinary kind, without the trouble and risk of stripping, and without the intermediate process of making a transparency.

May I point out a fact which has evidently been overlooked even by Mr. Armstrong, that such a process has already been described, and if "G. N. F." and others interested will refer to pages 740 and 824 of the ALMANAC for 1894, and to the report of the meeting of the North London Photographic Society, on page 174 of the current volume of the JOURNAL they will find a full description of the process to which I refer. By this process reversed copies of existing negatives may be made direct by contact printing, and if the details be once mastered—a very easy task—there is no difficulty in obtaining such copies in every respect equal to the originals. The ALMANAC for 1894 and the current volume are, or should be, in the hands of all your readers, so I will not occupy space by again detailing the process; it is sufficient for me to say that since I had the privilege of describing it for the help of my fellow-workers it has been, to my knowledge, most successfully adopted by at least some carbon printers of experience, who have found it effectually answer the purpose for which it was introduced. I am now using, for certain work, a negative reversed a second time—*i.e.*, from a reversal—the original negative, with some of Redmond Barrett's retouching, having been unfortunately broken.—I am, yours, &c., WM. BISHOP.

June 11, 1894.

CARBON PRINTS WITHOUT A REVERSED NEGATIVE.

To the EDITOR.

SIR,—Allow me to draw the attention of your correspondent "G. N. F." and others to the method of developing the exposed tissue on glass and backing up the print with paper or other substances, a reversed negative not being required. I send a few so produced for your inspection. No. I. is backed with thin paper, No. II. with a coating of gelatine and zinc oxide, as in the Eburneum process of Mr. Burgess. To give an appearance of warmth, red chalk was roughly rubbed on the back of No. I., while behind No. II. was placed a piece of orange paper. No. III., an interior, is backed with toned drawing-paper. Of course, prints so produced require framing, and for this purpose the imitation leather frames can be recommended as both cheap and effective.—I am, yours, &c.,

Acton, June 11, 1894. J. AUSTIN.

THE CENTRAL PHOTOGRAPHIC CLUB.

To the EDITOR.

SIR,—Kindly allow me to correct an error in Mr. Thomas Fall's letter in your last issue *re* our first excursion, on Saturday, June 16, which will take place at Leatherhead, and not *Maidenhead* as stated. We have made special arrangements with the London and South-Western Railway for a reduced fare of 1*s.* 6*d.* return and reserved carriages both ways. The train leaves Waterloo at forty minutes past two p.m. The Hackney and South London Photographic Societies have combined with us to make a big success of this outing. Members and friends wishing for tickets at the reduced fare must apply to me, as they are not purchasable at the booking office.—I am, yours, &c., WILLIAM F. SLATER.

169, *Southampton-street, Camberwell, S.E.*

PHOTOGRAPHIC SALON, 1894.

To the EDITOR.

SIR,—In your current issue you suggest that the Committee of the Photographic Salon would be wise if, like the conductors of other exhibitions, they would give some "information as to how or by whom the exhibits sent in are selected and hung — who, in fact, perform what are the equivalent of judicial functions." Although I have not been deputed by my Committee to reply officially to this suggestion, perhaps I may be allowed to offer a few remarks on the subject. I speak, of course, personally; but I believe, at the same time, that I express the feelings of my colleagues with regard to these points. It is true that in the case of photographic exhibitions we do not follow the general practice; but, if we consider the management of some other pictorial exhibitions—for instance, the Royal Academy, New Gallery, New English Art Club, Painter-etchers, and other societies of painters in oil and water colours—I think it will be found that our practice is in accord with theirs. I am open to correction; but, writing off-hand, the only exhibition I can remember which publishes the names of the selecting committee is that of the New English Art Club, and that only in the catalogue, after the opening of the exhibition. I cannot help thinking that, unintentionally, you have hit upon one of our strongest points. We hope we have created a new type in photographic exhibition management, and in this and other ways, in which we have differed from previous practice, we are glad to notice that our initiative has been followed, and is likely to be followed still more, by the managers of a more ancient photographic institution than our own. It will be sufficient to notice, amongst other new departures, that of printing the prices of pictures in the catalogue. In our opinion, it is sufficient, to gain the confidence of those whom we wish to see as exhibitors, that we should publish the list of our General Committee, who are practically responsible for the selection, and who may reasonably be entrusted to carry out the details of the working in the manner which they may judge to be the best. As you are the first to ask for information, might I ask, on behalf of our Society, the favour of publicity in your valuable paper of the names of the Committee (which I beg to enclose), all of whom are, I think, well known in the photographic world?

A more serious matter is the inference implied in the latter part of your note, that the best positions and a generous portion of the wall space in last year's Salon was appropriated by two or three of the Committee. I am not concerned to meet an allegation which has only been made by implication, and which possibly may be open to another interpretation; but I should like to take the opportunity of calling attention to the fact that in our gallery the hanging space is divided into bays, by which means we obtain a large number of good positions or places of honour, and that it would be impossible in practice that two or three members should occupy them all. The prizes, therefore, which we are enabled to offer may be said to be at least equal in value to the so-long-continued practice of medal distribution preferred by the management of societies of more venerable antiquity.

You do not anticipate that under our present system any considerable section of the exhibiting public will continue to support the Salon. I think I may say, however, that this is by no means our chief anxiety. The exhibiting public in photography is so large and miscellaneous that a small proportion is perhaps more likely to bring credit to the art than the system pursued, which covers the walls of exhibitions elsewhere. I am glad to say that we have every reason to believe that the Committee of Management of the Photographic Salon possesses the confidence of the most artistic section of photographers, both at home and abroad, and that we are in no danger of losing the support of any whose co-operation we are anxious to enlist. From this point of view the success of this year's Salon is, in fact, already assured. I am confident also, Sir, that we may count upon your support in drawing attention by publicity, even if we fail, unfortunately, to enlist your sympathy, to an institution which has proved itself of value to photography by its undoubted success last year. The managers of the Salon will, I feel sure, be always prepared to receive your comments and suggestions in the same good spirit in which they are given.—I am, yours, &c., ALFRED MASKELL.

The following is the list of the General Committee of the Photographic Salon, 1894:—Bernard Alfieri, J. Craig Annan, J. S. Bergheim, Shapur Bhedwar, Valentine Blanchard, Rowland Briant, Tom Bright, T. M. Brownrigg, Arthur Burchett, A. Buschbek, Eustace Calland, H. H. Hay Cameron, Lyonel Clark, Francis Cobb, Hector Colard, Walter Colls, William Crooke, Henry E. Davis, George Davison, J. Gale, John Pattison Gibson, William Asbury Greene, Karl Greger, Alfred Horsley Hinton, Frederick Hollyer, Richard Keene, Baron Alfred Liebig, Alfred Maskell, H. P. Robinson, Ralph W. Robinson, Baron N. de Rothschild, Lyddell Sawyer, Francis Seyton Scott, J. Strakosch, Frank Sutcliffe, Carl Ulrich, Henry Van der Weyde, J. B. B. Wellington, B. Gay Wilkinson, W. Willis.

Exchange Column.

Will exchange pair of fluted oil backgrounds, 8×6, new, for good violin.—Address, A. HARE, Photographer, Sutton, Surrey.

Will exchange whole-plate, single-view lens, for half-plate wide-angle, by good maker.—Address, A. H. ARCHER, Photographer, Bishop's Stortford, Herts.

Wanted, good hot rolling burnisher, in exchange for twelve-inch bar burnisher, in good condition as new.—Address, A. E. STANLEY, Lansdown, Stroud, Gloucester.

Will exchange whole-plate box camera, brass-bound, two single backs, for a landscape background, a tripod, or time shutter.—Address, L. HAYWARD, 4, Exmouth-road, Southsea.

Will exchange eight feet by seven feet six inches interior background, by Marion, cost 2*l.* 15*s.*, for half-plate rectilinear lens, any maker.—Address, J. B. STOKES, 12A, New-road, Southampton.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

PHOTOGRAPHS REGISTERED :—

Frederick Argall, Truro.—*Souvenir of the "Billy Bray" centenary.*

Charles Rowland Whiting, Ealing.—*Seascape off Cowes, Isle of Wight, entitled "A Nocturne."*

Horace Greaves Pike, Lichfield.—*Portrait of H.R.H. the Prince of Wales, and group of the Staffordshire and Yeomanry officers.*

R. W.—See reply to A. J. K.

F. A. BOURNE.—Sulphocyanide toning baths are not usually considered to be worth saving.

J. E.—See pages 865–929 of the ALMANAC for 1894, where numerous metol, eikonogen, and quinol formulæ are to be found.

GEO. GLOVER.—We are sorry to inform you that a patent was granted in 1868 for an invention precisely similar to what you indicate in your note.

TOURIST.—By leaving Liverpool-street Station at eight o'clock in the evening, you will arrive at either Antwerp or Rotterdam at nine next morning.

A. J. K.—An exhaustive paper, by Colonel Waterhouse, *On the Reversal of the Negative Image by Thiocarbamides*, was published in this JOURNAL of September 19 and 26, 1890, pages 601 and 613 respectively.

GEORGE.—Information concerning the various paper and plates are contained in Dr. Just's *Manual on Bromide Printing*, Woodbury's *Printing-out Paper*, Abney's *Photography with Emulsions*, and his *Instruction in Photography*.

VERDANT GREEN.—Gelatine which has been deprived of its power of solidifying when the solution becomes cold is termed meta-gelatine. This condition is brought about by long-continued boiling, or by mixing with it acids of various kinds.

S. P. W.—To remove organic matter from water, add to it a small quantity of an alkaline permanganate, such as that of potash, stirring it well up, and continuing the addition until, after having remained quiescent for a brief period, a delicate pink tint pervades the water.

"49" says: "Can you give me some idea of Hurter & Driffield's speed number for Ilford isochromatic plates, medium rapidity?"—In reply, we have no information on the point. Perhaps some reader who has tested the plates named by the Hurter & Driffield method can give the speed number.

C. TURBEY.—The negatives sent do not show any signs of what is known as halation. The appearance is really due to the sun shining on the lens at the time the exposure was made. It must not be surmised that, as the exposure is very short, the sun on the lens is of less importance than if it were longer.

OPTICS.—For your purpose, a rapid rectilinear of about six inches focus would prove the more useful, although the distortion arising from employing a single lens for groups and animals would be undistinguishable. The lens marked A of the maker named is a very fine one; we are not acquainted with the other.

POSITIVE.—Protonitrate of iron is made by mixing a solution of protosulphate of iron with one of nitrate of baryta in their combining proportions, and afterwards filtering out the insoluble sulphate of baryta formed. Protonitrate of iron was used by a few many years ago in the collodion process for positives on glass.

TOURIST asks: "Who are the proper authorities to apply to for permission to photograph in the Crystal Palace and grounds?"—Messrs. Negretti & Zambra. They have the sole right to take photographs at the Palace. They may possibly grant you permission to photograph there—of course for a fee—but we do not know. Better write them. Their address is Holborn Viaduct, E.C.

J. HARRISON.—Simple meniscus lenses of various foci, from that of a few inches up to seventy or eighty, may be purchased at any spectacle-maker's, but they will be in the rough as regards the edging and centering. The optician will, of course, fit them into such mounts as may be required at an additional price. Simple meniscus lenses are generally described by spectacle-makers as periscopic glasses.

CREWE.—Carbon prints on ivory are—indeed, they must be—made by the double transfer method. They could be produced by single transfer, but contact with the bichromate and the ivory would produce a stain in the latter which would materially mar the result. The ivory serves to absorb the bichromate, and no amount of after-treatment, except such as would injure the image, appears to remove it.

D. H. HAYES.—No patent rights are claimed for the use of eosine in connexion with collodion, either with or without ammonium, so far as we are aware. The first use of eosine as an "orthochromatiser" was with collodion, and it is very unlikely that any claim for its use in this way now would be put forward. If it were, it would be impossible to sustain it in a court of law, unless, indeed, some entirely new method of using it were introduced.

LONDON AND COVENTRY PHOTOGRAPHIC COMPANY.—To insert your letter would be a libel on the firm. The weight of the residue sent is no criterion as to the amount of silver it contained. As to that, you give no data whatever; therefore what reason is there to surmise that there was more silver in the residues than the refiners have accounted for? We shall probably have something to say about this matter when space will permit, as we have recently received several letters on the subject.

W. BARRETT says: "I shall be glad to know whether it is legal or not to take portraits at one's own studio privately on Sundays?"—We know of no reason why you should not take portraits in your studio on Sundays without going in fear of the law.

A. BRADEN.—Certainly; there would be an advantage, on a hand camera, in a lens that would work with an aperture of *f*-6 over one with an aperture of *f*-8. It must not, however, be imagined that a lens with the former aperture, of five-inch focus, will cover a quarter-plate nearly so well as one with the latter opening and of five-and-three-quarter-inch focus. If a lens is required to give fine detail, with an aperture of *f*-6, all over a quarter-size plate, it need be between six and seven-inch focus at least.

C. C. C. says: "I have just had a batch of chocolate mounts sent in exchange for some I returned because the colour on them stained the prints, and the prints all peel off at the edges when they are dry and burnished. I use starch, just as I always have done, and, on trying the same starch on the staining mounts, the prints stick all right. Can you help me?"—Evidently the surface colour is fixed with some medium with which the starch does not assimilate. Try a weak solution of gelatine that contains a little alcohol.

MR. A. PITCAIRN-KNOWLES, of Berlinstrasse 125, Charlottenburg, writes: "Would you kindly give me some information in your next number as to whether there is any institute in England similar to the Photo-chemical Laboratory of Professor Vogel in Berlin, or of Professor Eder in Vienna, and what subjects are taught at the same? I should like to know particularly whether an establishment of that kind exists at the Camera Club in London."—The only institution in England analogous to Eder's or Vogel's laboratories in Berlin and Vienna is the Polytechnic, 309, Regent-street, of which Mr. E. Howard Farmer is Principal. Here facilities are given for studying most, if not all, branches of practical photography at very moderate fees.

T. O. O. says: "I made up the following solution for sensitising paper:—Silver nitrate, 2 ounces; water, 16 ounces. The formula said distilled or rain water. As I had none of the former, I used the latter. At first the solution appeared a little turbid, and then it assumed a brown colour, which it retained after filtration. What shall I do?"—Rain water is frequently recommended in place of distilled water, but when it is collected in the neighbourhood of large towns, or from the roofs of buildings, it is generally far worse than common tap water. Add a drachm or two of a solution of common salt to the solution, and expose to the sun for a day or so, then filter and slightly acidify with nitric acid, and all will be right.

T. A. W. writes: "I herewith enclose two photographs, which have been between blotting-paper for the purpose of straightening them, but, on taking them out, I found them stained with red and yellow spots, as you will see; They were left in the blotting-papers for about two days. Can you inform me how this is, and the cause of them staining? The blotting-paper was sold me for that purpose. Also, is this the best way of straightening photographs? And will you kindly inform me how to eliminate the stains, as there are about forty stained?"—The stains are due to a species of mildew, owing to the prints being kept so long damp. It is a good way to dry prints flat between blotting-paper, but the paper should be dry before they are placed between it, then they will be dried in a few hours, and there will be no stains.

O. O. writes as follows: "I am anxious to know whether there has ever been invented anything to lessen the usual time taken for retouching? I have made a certain composition so that I can retouch a cabinet large head in sixteen minutes, and a *carte-de-visite* in five. Will you please give me your advice as to whether it would be worth my while patenting it, and if it would fetch much money? If you will favour me with an answer, I shall be extremely grateful."—We have many curious queries sent us from time to time; the above is one of them. Many negatives are "retouched" in much less time than that mentioned, but perhaps that is mainly due to the *composition* of the retoucher himself, and not to the "composition" he uses. As no details are given of the one in question, no opinion can be expressed as to its probable merits.

LENS (Southampton) writes: "I have a Dallmeyer 4B patent, at the back of which there is a screw arrangement, with notches cut on the mount. Can you tell me what this is for, and what advantage is gained by altering this?"—In reply: The *raison-d'être* of the screwed ring with notches is this: When the notched ring—which is really a cell containing a lens—is screwed home, the objective gives sharpness of a very high order; but, by unscrewing this cell, a certain amount of aberration is introduced, causing the sharpness to be of a lower order. This aberration increases in proportion as the cell is screwed out, one, two, three, or more notches, which are merely for the purpose of noting the amount of aberration introduced. This system is useful, especially when producing large heads, for by it the rugosities in the face are rendered less pronounced in the photograph than if they were reproduced with a needle-point-like degree of sharpness.

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THE BRITISH

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WIDE ANGLES.

We have so often spoken of the occasional advantages to be derived from the ability to produce pictures which, in regard to the extent of subjects included, may be termed panoramic, as to render it unnecessary for us to do so on this occasion.

When writing, in March last, on *the Angle included by a Lens*, we stated that, while it was not easy to differentiate between a medium angle and a wide angle, one in which the focus of the lens and the base line of the plate to be covered were equal, and which represented an included angle of 53°, might be considered a fair centre of a border land between the medium and wide angle.

But occasionally, and according to the nature of the view desired to be taken, it is desirable that an angle very greatly in excess of this be included, and for some time we have bestowed some consideration on the best means for effecting this with the least expenditure of mechanical means, which are usually synonymous with increased expenditure of money. The perfection of panoramic cameras is to be found in the panascopic camera invented by Johnson & Harrison, or in the panoram, more recently introduced by Colonel Stewart. But both of these are necessarily costly instruments; besides, the former of them has now ceased to be made.

We have long thought that a camera which would include an angle of about 90° on the base line of an oblong picture would prove a boon to many of the public, especially if it were supplied at a cost which would be within the reach of the average amateur. In order to test the practicability of certain ideas which at various times have suggested themselves or been suggested, we have had model cameras constructed in which some of them are carried into effect.

We start on the assumption that lenses which are constructed to give a very large field of delineation or circle of illumination fail in making the whole of such area available on account of their not having the requisite flatness of field. Such a lens can only cover flatly if it is fitted with a diaphragm approximating to pinhole dimensions. What is now required is perfect correction of the oblique rays even if the field be round. Working with such a lens, it will be found that on a flat plate the image is sharp in the centre only, and rapidly falls away in blurriness as it approaches the margin. By bringing the focussing screen nearer to the lens, so as to get the margin sharp, and noting the space through which the ground glass has to be advanced, the degree of roundness of the field will be ascertained.

Now, if provision be made in the dark slide for bending a celluloid sensitive film to the curve thus indicated, and a negative image be then impressed, it follows to a dead certainty that the resulting picture, although taken with a large aperture, will be sharp to the very edges. Having ascertained this from actual trial, we can strongly assert both its practicability and the ease with which it can be carried into effect.

In one instance we took an 8×5 dark slide, and, without touching the centre of the rebate, against which the plate rested, we imparted a roundness to the ledge by cutting it away, until, when a celluloid film was placed in it, and pressed forward, so as to be in contact all over, it was found to have assumed a curved or cylindrical form. It was not much, but quite sufficient to sharpen the margins by bringing them into focus. A rounded pad pressed against the back of the film ensured its remaining curved until it was taken out for development, when, by the release of the pad, the plate resumed its pristine flatness. By the adoption of this method, a lens of four and a half inches focus was thus enabled to cover an 8×5 plate with a comparatively large aperture, and, by making use of a V-shaped vertical bar to impede central rays, the negative was evenly illuminated to the corners. On examining the image on the focussing screen, we felt that, with the same lens and by this arrangement, a much larger plate than that used might easily have been covered.

The use of this for taking a widely scattered group by a rapid exposure will suggest itself. In order to test the comparative gain arising by the employment of a curved film as against a flat one, we brought two of them over against a cricket field filled with players; lens, films, and all alike in every respect except that one film was forced into cylindrical shape and exposed one after the other, using for this purpose a gravity shutter. On developing, the inestimable advantage of one system over the other was immediately apparent. Both were perfectly exposed, but in one the sharpness was confined to the central portion of the plate, while the other was sharp all over.

In carrying out still further the idea of exposing films in a slightly curved condition, we have had metallic sheaths constructed with a curve of the requisite radius in which to insert the films. The application of this system to the employment of the Eastman or other roll-holder has also claimed our attention, but this we must reserve for another article in which we shall give more prominence to panoramas pure and simple. At present, we conclude by a brief description of methods we had in use four years ago for effecting the bending of the film, and we give them, not as being the best, but by way of inciting others to improve upon them.

One, and the best of them, consists in dropping the film into an aperture quite straight and square at the top, and, when

down in its place, then liberating a pusher behind by which the film is forced forward against two curved faces, one each at top and bottom. After exposure, the pusher is withdrawn, and the film, resuming its flat form, is removed to make way for another.

Carrying out the idea in another way, we have a dark slide with a vertical aperture in the side corresponding with a grooved slot in top and bottom inside, these slots being slightly curved, so that, when the film is slidden in at the vertical aperture, it naturally assumes a cylindrical form as it is inserted.

PHOTOGRAPHIC RESIDUES AND THEIR VALUE.

Despite all that has, from time to time, been written on the subject of photographic residues, there still exists a considerable amount of misconception as to their value. During the past few weeks we have received an unusual number of letters—beyond what we are constantly receiving—complaining of the small return made by refiners for wastes sent them for reducing. In some instances the complainants have gone so far, by implication, as to impeach the integrity of the refiners without a shadow of reason for the imputation. In not one of the letters was there any tangible evidence given to show that the residue contained more than had been fully accounted for. The data given is of the vaguest possible kind, and the letters show that quite an erroneous idea exists with some as to the actual value of metallic silver itself, as evidenced by the small parcels of waste sometimes sent for reduction. Here are two or three examples of the complaints.

One correspondent says he sent so many ounces of sensitising bath, which the argentometer showed contained so many grains to the ounce. Now, the so-called "argentometer" is a most fallacious indicator, as it invariably shows, with a well-used bath, considerably more nitrate than it actually contains. It is merely a hydrometer, and sinks or floats according to the specific gravity, whatever the solution may be, even if it contains no silver at all. In a solution of common salt, for example, it would act precisely as it does in one of nitrate of silver. However, if the argentometer is rightly adjusted, and is employed for the temperature for which it is adjusted, it will, with a pure solution of nitrate of silver, register correctly; but, as the sensitising bath becomes contaminated with other salts, such as the nitrates of ammonium, sodium, barium, &c., so will the test become more or less fallacious. Few, we should have surmised, would have thought it would pay to send two or three pints of solution from the country to London for the refiner to deal with, at the present price of silver, and certainly not, on the slender argentometer data, complain of the return made. Had the silver been precipitated, washed, and dried, and then weighed, its exact value to a farthing would have been known.

Another writer says he sent the residues from the fixing of so many dozen quarter-plates and half-plates, and so many sheets of paper, adding that he did not think any of the silver had been lost, and complains of the smallness of the sum remitted. In this case, what evidence is there to form an opinion upon as to the value of the residue? Messrs. Haddon and Grundy have shown that the average quarter-plate contains but a grain and a quarter of silver as it leaves the maker, and some much less than a grain. When it is considered that the greater portion of that small quantity is taken to form the image, there cannot be much expected in the fixing solution. The same remark applies to paper, especially the gelatino-chloride printing-out papers. In this case, had the sulphide of silver been washed and dried, its value could have been estimated exactly; then an opinion could have been arrived at as to whether a fair return had been made or not.

One of the complaining correspondents says he forwarded so much ashes from paper, and only got a small amount in return. In this case only the weight of the ashes is known, without the slightest idea whatever of the proportion of precious metal they contained. Only those who have seen, as we have, the heterogeneous masses sent to refiners have any conception of what composes "residues." Some time ago we were shown, at a refiner's, about a pound and a half of broken negatives, nails, pins, parts of printing-frame springs, &c., which had been roughly separated from ten pounds or so of residues. Of course, all this figured as so many pounds of "silver residues." It is, we are told, a very common practice with photographers to send the chloride and sulphide residues in a pasty state, sometimes containing fifty per cent. or more of water. In that state, of course, no estimate can be formed as to its value. The water has to be driven off before the silver is reduced, which necessarily increases the labour of the refiner, and it has to be paid for.

It may save disappointment to some to say a little about paper residues. When photographers used to sensitise their own paper, strong baths were employed, consequently the paper contained a large proportion of free nitrate. That is not the case now with the ready-sensitised albumen papers. Hence the ashes from them must of necessity contain far less silver than those which were of home sensitising. The gelatine printing-out papers contain much less silver still, and, what is more, the ash from them is far heavier than that from albumen paper. In the first place, the paper itself is of a different kind from that used for albumen, and, when burnt, yields more ash. Furthermore, this paper is surfaced—enamelled—with sulphate of baryta—"baryta white"—a very heavy material, which remains after the paper is burnt, and possibly increases the weight of the ash fifty per cent. or more. Therefore it will be seen that the value of ashes of paper of the present time cannot in any way be compared with those of only a few years ago. By the way, it would be interesting if some experimentalists were to give us the average amount of silver per sheet in the commercial papers, as Messrs. Haddon and Grundy have done with plates.

There is another phase of the question that none of the correspondents seem to have taken into account, namely, the value of the silver when it is recovered. The present price of standard silver varies, according to the daily market, between two shillings and fourpence and two shillings and fivepence per troy ounce. A little while ago it was down to two shillings and three pence per ounce, that is for silver of the standard quality, but the metal recovered from photographic wastes is often very impure, and is therefore of proportionately less value. Supposing that, say, ten ounces of metal is recovered, and it is of the standard fineness, its value is under twenty-four shillings, and from that sum the refiner's charges have to be deducted. Some years back the price of silver was more than double what it is now, and at that time the ashes from paper contained several times the quantity of precious metal they do at present, hence the discrepancy in returns now and then.

We are not writing in defence of refiners, but to point out that it is most unjustifiable to impugn their honesty when the

senders of residues have not the ghost of an idea as to the metal they contain. It is a very simple matter to estimate the value of residues before sending them away, and, if that were always done, there would possibly be less complaint of refiners. We shall probably have something to say on that subject shortly.

Death by Electricity.—Though we do not remember to have heard of a case of death through accidentally receiving the current used in a photographic electric light installation, so many deaths are recorded from such shocks in other cases where the light is employed, that when this mode of illumination becomes more common such a catastrophe may be expected. It is, therefore, well to note that, at the French Academy of Sciences, M. d'Arsonval recently contended that the death so produced was only apparent, and not real, and that by treating persons so struck they might recover if subjected to the usual treatment for drowning.

The Twenty-eight-Inch Greenwich Refractor.—The object-glass of this instrument has been tried in the photographic position, with the crown lens reversed and the lenses separated as suggested by Sir G. G. Stokes. To find the exact distance of separation at which the best results were obtainable has taken much time, and the small modifications required in the cells and special contrivances, devised for the delicate adjustment of the heavy crown cell and lens, for the exact adjustment of the crown lens for tilt and centering, still increased the delay. A large number of photographs have been taken with the lenses at various distances, and these are expected to be very useful in arranging the Thompson twenty-six-inch photographic telescope.

Insect Destruction in Hot Countries.—Quite apart from the risk of fading that photographs in hot countries are subject to, there is always the interminable insect foe to contend with. Some, but not all, of the preventive treatments used for books in India might with advantage be employed in the case of photographs. In the Library of the Revenue and Agricultural Department a little benzine collas is poured into the crevices of the binding, and the books shut up for a few days in a close-fitting box. In the Indian Museum Library the books are kept in complete safety in close-fitting glass cases with a few ounces of naphthaline on each shelf. Such a plan would be admirable for photographs, while, on the other hand, it will need no warning from us to prevent our readers adopting the plan of the Royal Botanical Gardens at Sibpore, for they employ a saturated solution of corrosive sublimate in alcohol to brush over the leaves.

Spontaneous Combustion of Yellow Paper.—Mr. A. Dupré, of Sutton, Surrey, has reported a case of true spontaneous combustion which occurred with a lamp shade of crinkled tissue paper. Mr. Dupré describes the shade as a combination of white and yellow crinkled tissue paper gathered in a bunch, and states his belief that the accident that happened was caused by this paper spontaneously igniting. The danger is stated to be owing to the chromate of lead used to colour the paper. The presence of this ingredient may be detected by setting fire to a piece of the suspected paper, and, blowing out the flame, a glow will continue along the burnt edge till the whole is consumed like "touch-paper." Photographers are already so much under the ban of the insurance companies that it would be well to remove the possibility of any accident from such a cause by specially examining any yellow or canary paper in use to see whether it answers or not to the above simple test.

The Value of a Negative.—In the courts last week, before Mr. Justice Grantham and a common jury, the action of Lorrie and Wife *versus* Craze and Wife was tried. The plaintiffs keep a photographer's shop in the Commercial-road in the East-end, and the defendants are their next-door neighbours. It appeared that in August last Mr. Lorrie accompanied a large number of the members of the East London Licensed Victuallers' Association on an excursion down the river on the vessel called the *Clacton Belle*. The occasion was one on which they made a present to their Secretary, and the plaintiff took a photograph of the group, and was promised a large number of orders for copies. He had but one negative, and this he placed on the cheffonier in his studio. The defendants, it appeared kept fowls, and the plaintiffs' chief claim was founded on the fact that one of defendants' cocks got into the studio and smashed the negative. Mr. Crispe appeared for the plaintiffs, and the defendants were unrepresented. The jury gave a verdict for the plaintiffs, with 40*l.* damages, and judgment was given accordingly.

Peroxide of Sodium.—This substance has an increasing interest, and a full account of its properties, as recently published in a foreign journal, suggest a possible use in photography, if it could be procured sufficiently cheaply. Herr T. Poleck, in the course of a minute examination of its properties, states that it reduces salts of mercury, silver, and gold with liberation of oxygen. It would seem to be of probable use for precipitating the silver from waste fixing solutions—either print or negative—without any risk of the unpleasant smell which often accompanies the free use of liver of sulphur for that purpose. It would also throw down any gold present, which in waste fixing from gold-toned silver prints is always thrown down in sufficient quantity to cause the refiner to give several pence per ounce higher price than for the metal from chlorides. It is, as we have before remarked, very singular, but not more strange than true, that so large a proportion of photographers throw down the sink this most valuable of all photographic "waste."

Photographic Salon, 1894.—Messrs. George Davison & Alfred Maskell write: "We have the honour to inform you that the Photographic Salon, 1894 (second year), will open at the Dudley Gallery, Egyptian Hall, Piccadilly, on Monday, October 1, 1894, and remain open until November 3 following. The aim of the Committee is to collect for exhibition only that class of work in pictorial photography in which there is distinctive evidence of personal artistic feeling and execution. The great success achieved by the Salon of 1893 has established the Exhibition in the estimation of the public, and of the artistic and general Press, and the Committee are determined to make every effort to ensure a still greater success and influence for the Exhibition of the present year. Full particulars and entry forms will be published and forwarded in due course. Meanwhile the Committee trust that all who are interested in furthering the art of pictorial photography will give their assistance by submitting the best examples of their recent work, and by bringing the undertaking under the notice of those capable of rendering valuable co-operation."

Methylated Spirit.—So great is the importance of this chemical to a large branch of manufacturing industry apart from photography, that it has been thought worth while to write a pamphlet devoted to it. *Methylated Spirit, a Compendium for the Retailer and Laboratory Director, with some Information for the Public*, is the title of a little *brochure* by Mr. Algernon Warren; publishers, Messrs. Arrowsmith, of Bristol. It contains a complete account of all the restrictions attending its purchase and storage, and the method of overcoming them with the least trouble. It is an undoubted boon to photographers using it at all largely that the old kind of spirit—that is to say, without addition of mineral oil, wood naphtha being the only agent used to render it non-potable—may still be obtained under certain conditions, not at all difficult, though certainly troublesome. What it is wanted for, and the probable annual consumption are the chief factors of information needed. Afterwards it must be ordered upon special forms provided by the Excise, stored in one particular room distinctively labelled over or about the entrance, a register of the purchase kept, the premises kept open to the occasional visit of the Excise officer, and, finally, the "permit" sent out to purchaser by the seller with each package of spirit must be carefully kept for inspection when called for.

PHOTO-MECHANICAL NOTES.

Our own country, as usual, I regret to say, where process work is concerned, is lagging behind Germany, Austria, France, and the United States in the matter of the photo-chromo processes. One cannot say that the subject is totally neglected, for several English firms have the plant already laid down, and are actively at work experimenting in this direction. Still, there is no mistake about it, we are behind, for, whilst we are experimenting, really practical results, produced commercially, come to us from the countries mentioned. Moreover, those English firms who are endeavouring to work the processes have bought the methods from German workmen, who have been imported to teach the processes. It is, in fact, to Germany that we must look for most of all that is known on the subject, and for the best results. This is due, in a great measure, to the researches of Dr. Vogel and other German professors into the theory of colour photography, and to the mass of information published as a result of their labours, but of which only inadequate translations have found their way into the English press.

It is, perhaps, one of the advantages of coming last in the field, that one is able by a retrospective glance to dispense with much wearisome experiment, and, with regard to the colour process, so much has been done that the ground is practically plotted out. The three-colour system is the basis of all the colour reproduction processes, and the principles underlying this are now pretty well known. Nothing seems more simple than to place in rotation before or behind the lens three suitably coloured screens, and secure three negatives from the same object, each negative picking up its due proportion of the three primary colours. But the process does not begin nor end there, and in practice harassing difficulties will present themselves, and it will require great skill and patience to obtain passable results.

Sets of the three-colour screens, I hear, will shortly be on the market, and thereby one difficulty will be removed, for it will save the necessity of having to study the suitability of various colour-filtering mediums. The commercial screens are announced to be of red, green, and violet, these now being accepted as the best colours. Immediately behind the lens will be the most suitable place for them, and it will be necessary to use in conjunction with the red and green screen isochromatic plates. For the blue an ordinary plate registering about 18 or 20 on the sensitometer will suffice. Now, in this connexion, one of the difficulties of the process presents itself. Rapid isochromatic dry plates may in skilful hands prove suitable enough for making negatives for collotype, but what shall we say of the half-tone process, in which we must use either a slow dry plate or collodion? Just imagine an attempt to make an exposure on a wet-collodion plate, with a line screen in front, a colour screen behind the lens, a reversing mirror also intercepting, and a necessary stopping down for screen effect to about *f*-16. Life is too short for such exposures, especially if we are to depend upon the daylight of our fickle clime. It would seem, in fact, that the electric light will be absolutely necessary to work a process of this kind in order to ensure constancy, for a variation in the density of one of the negatives would quite throw out the whole scheme of colour.

This difficulty of varying density will present itself most forcibly in negatives for collotype. Indeed, the difficulties in applying the process successfully to collotype are almost insuperable, although most people seem to think that collotype in colour has a great future before it. There have, I admit, been some very beautiful specimens published of this process, but there have been many indifferent ones, and we have not seen the failures. Just consider, first, the difficulty of securing three negatives of relatively equal value from the same subject, and, moreover, of absolutely equal size; further, the difficulty of making three printing plates also equal in quality; and, finally, the utter impossibility, with the hand roller at all events, of inking these plates to the same shade of colour every time. The latter difficulty will not, of course, be so great in machine printing, but even there it will require the services of a skilful chromo-lithographer as "machine-minder." Again, colour printers know well the trouble which changes of temperature give them. It is often impossible to repeat, at a subsequent day's working, the colour arrived at when starting.

My opinion is that a commercially satisfactory colour process will only be obtained by the aid of the divided screen in conjunction with the coloured screen, because we have only then to get a black and white negative, *i.e.*, black lines or black dots, with clear spaces between, the half-tones regulating themselves according to the now generally known principles of half-tone work. For colour work there is no reason why the divided screen should be of mechanically ruled lines or stipple; one of the colours might be done with a grained screen, similar to the grain on a photogravure plate, or a reticulated grain, similar to a collotype plate, and it is not impossible to produce such screens.

One important point must not be overlooked in using mechanically ruled screens, and it is this, that one set of ruled lines printed over another in the same or nearly the same direction will produce a striped or *moiré* effect. It is therefore quite impossible to use the ordinary cross-lined screens. The acknowledged substitute is a single-lined screen, shifted to different angles for each colour, but here again it must be remembered that if one colour formed of a series of lines crosses another at too acute an angle, the same *moiré* effect is seen, the minimum angle at which a pair of line systems can cross without showing this water marking being thirty degrees. Albert, of Munich, one of the most successful workers of the half-tone colour process, takes advantage of this fact, and crosses his colours at not less than thirty degrees to each other. Thus, in a very fine example of his work in Eder's *Jahrbuch* for 1893, a single-line screen of about 128 lines to the inch appears to have been used. For the yellow it has been placed at about thirty degrees to the base line, for the blue at sixty degrees, and for the red at 120 degrees. The mechanical harshness of the ruling is quite overcome, and the result is beautifully soft and rich in colour. A peculiarity of the grain, when examined under a strong glass, is that the lines are—if I may paradoxically put it—not lines at all, but chains of dots of an oval shape, just joined at their narrow ends. This effect may, as I indicated in my last "Notes," be produced by using a pair of single-line screens, and exposing one way for a longer time than the other, or it may be brought about with a cross-lined screen by altering the shape of the diaphragm in the lens to somewhat the shape of an I. There can be no doubt that Albert, by some such method as this, has gained better "colour" than he would have done by securing simply straight-edged lines.

Kurtz, of New York, uses single-line screens. For one colour the lines are perpendicular, and for the other two they cross at forty-five degrees. The effect is mechanically harsh, and the colours do not blend as nicely as they do in Albert's work. One would have thought that Kurtz, being one of the most successful half-tone workers in the States, would have known that unbroken single lines cannot possibly carry the full tones of a picture. The tones will be too light where they should be dark, and too dark where they should be light, the high lights being consequently muddy, and the whole picture flat.

Husnik, of Prague, adopts a more daring method than Albert. He chops up his lines completely into dots, yet when the three stippled blocks are printed one over the other, no *moiré* effect is observable. This one can understand if you imagine the dots to be in rows, one row crossing the second at forty-five degrees, and the third running perpendicularly through. The rule for avoiding the *moiré* effect holds good for dots as for lines so long as the dots are wholly dots, and not partly connected into cross lines, as they would be in black and white half-tone. Husnik, too, appears to use a ruled single-lined screen, reversed in course of exposure, and producing a rounded dot. The screen is coarsely ruled, about 120 lines to the inch, so that the dots can, to some extent, lie between each other. The colour is more crude than in Albert's method, but it is better than Kurtz's work according to the example I have seen.

The French method of chromotypy consists in taking an ordinary black and white half-tone block as the key, and preparing colour plates by hand. Usually a number of transfers are made from the key block upon zinc plates grained by the photogravure method, and the portions of the picture intended to print a certain colour are stopped out with varnish, the rest being etched, practically according to the old aquatint process. It has occurred to me that an aquatint plate introduced into one or other of the photochrome processes previously described would greatly improve them; but, as I have before indicated, there is no reason why this should not be produced with a grained screen.

William Gamble.

ARCHITECTURAL AND GENERAL INTERIOR PHOTOGRAPHY.*

In interior church and cathedral work we have an endless variety of subjects, comprising, beside the general views, old monuments, trophies peeps between columns (generally very effective), the organ, reredos, choir stalls, and a hundred-and-one other subjects all capable of being effectively treated and yielding picturesque negatives. Beside these there are quaint caps, spandrels, windows, window traceries, and subjects showing the blending of one period into another, which, from an educational point of view, are extremely interesting and valuable. In fact,

* Concluded from page 379.

to an earnest worker, one building will provide work for a considerable number of weeks.

Always use the longest-focus lens possible, especially in general views. Close prominent objects, if very large on the plate, will help to increase the defect of a short-focus lens, resulting in the false appearance of perspective.

I would ask you, gentlemen, to remember that there are established rules of perspective, that even a slight rise of the front of the camera alters the perspective. But how many think of that when placing their camera in almost every conceivable position, forgetting that they may so falsify the resulting photograph as to utterly spoil it as a means of showing the subject as they and others see it? I have refrained from going further into this interesting subject, as you had it so effectively treated by Mr. McIntosh at the last meeting.

In domestic interior work we have an entirely different and far more difficult class of work. Drawing and dining-rooms, halls, staircases, libraries, &c., make very pleasing photographs if executed carefully, and, moreover, give good scope for artistic treatment in the grouping of furniture, &c. Possibly the greatest trial is to avoid the hard cast shadows which are always present in such work. To do this satisfactorily, and for the photograph to be a success, this is imperative. Always give a very full exposure, endeavouring to flatten down the result; in fact, an under-toned plate is worse than useless, showing excessive hardness and very often halation of the bright points of the room.

Some knowledge is required in selecting the best point of view. A great many workers fly to the corner of the room. This is not always the best position, for, if the room has a ceiling composed of squares or has any number of straight lines, the corner view will give a very unpleasant and distorted appearance to it. A much better position is to place the camera nearer to the centre (but not quite in the centre) of the shortest side, keeping it as parallel as possible with the sides of the room. Always notice on the screen the appearance given by the different pieces of furniture, as there are certain angles when a round-backed chair will present an oval appearance. Objects near the corner of the plate will be distorted or drawn out considerably; in fact, you should always compose your picture on the screen, not judging what it will look like from the front of the lens. One more point in using wide-angle lenses: Always remember that there is a considerable loss of light at the corners of the plate; try and allow for this by substituting light for dark objects in those particular places.

Of the various carpets met with, green photographs capitally, and will show the furniture off to the best advantage. Red felt and pile carpets also photograph well, as they generally reflect a quantity of white light. If you have a large table in the room with a pattern tablecloth, be careful

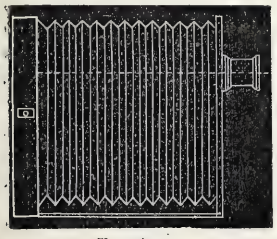


Fig. 4.

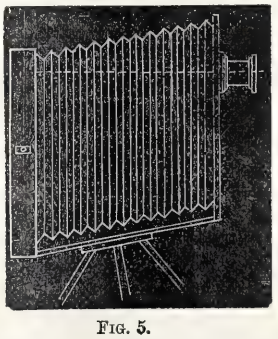


Fig. 5.

not to get it too near the camera, otherwise it will look like the carpet and will give a peculiar appearance to the room. Regarding the pictures, oil paintings, unless modern, reproduce very badly. On the other hand, water colours are liable to be hard and unpracticable. If reflections appear in the glasses, they must be got rid of, a paper wedge behind one corner of the frame being generally sufficient. Attention to these matters should always be given when pictures form an important item in your photograph, and therefore expose accordingly. China also comes out very hard and crude; blue china, although sometimes very deep in tone, will be scarcely printable.

In dining-rooms, when you have the cloth laid, expose for the darkest shadow of the room and well back your plate. If carefully developed, the tablecloth will print out, showing all the detail without any trace of halation being present.

In arranging a room for photographic purposes, avoid a jumble of small pieces of furniture; this looks very bad, and gives a showroom appearance. At the same time it is as well not materially to alter the appearance of the room, as people have a pardonable weakness for the photograph to represent the room as they and others see it in their every-day life. Also, when taking a series of views in one house, do not use a short-focus lens for a small room, for it will result in making the small room appear as large, or larger even, than the others. Your customer, uneducated in the mysteries of wide-angle lenses, will somewhat marvel at the phenomenon. This to a professional is more important than it seems, and should always be borne in mind.

3. *Focussing and Exposing the Plate.*—Photography has limitations. This is forcibly brought home when photographing in elevation. For instance, when desirous of taking the *façade* of a cathedral standing in a forty-feet roadway, what are we likely to experience? Having most carefully arranged the apparatus, squared the camera, placed the lens as high as it will go, still, to our dismay, a large portion of the subject is absent from the screen, and in its place, to our disgust, there protrudes considerably more than a satisfactory amount of uninteresting foreground. The usual course to adopt in such a case is to tilt the camera and swing the back to a perpendicular position. Now, if in possession of a camera having a swing front such as I have described, the requirements are to be accomplished with greater ease and quickness, and with generally far better results. When the front of the camera has been raised very high, the axis of the lens is considerably above the centre of the plate, and in consequence, unless the lens is of great covering power, the two top corners of the image will be cut off. Now, by swinging the front or lens board, obviously the axis of the lens is placed in a more central position, and at the same time the desired result is obtained. I would here point out that swinging the front will not produce more top than tilting the camera and swinging the back, as is sometimes stated. Both produce approximately the same; but, when the lens has been raised until the corners of the plate are cut off, then, by swinging the front, and afterwards slightly lowering the lens board, you have the same amount of subject without the objectionable black corner (see figs. 4, 5, 6, 7, 8, and 15). I should here like to explain to the younger members what "raising the front" means, as I have found people going about the world with the idea that raising the front and raising the camera are one and the same

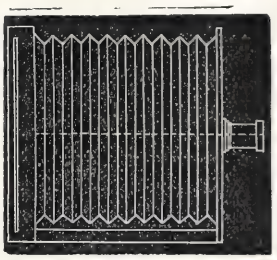


Fig. 6.

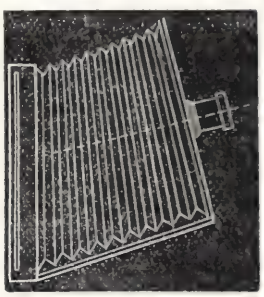


Fig. 7.

thing. We will say, for instance, that our building is eighty feet high, and the image, when it is all on the screen, measures ten inches. The scale is one inch to eight feet. When first looking at the screen, we find, say, sixty feet represented, leaving twenty feet absent. Now, if we raise the front four inches, we get an additional twenty-eight feet of subject, leaving eight feet to spare, which will, of course, be represented by sky. This is not quite accurate, there being a small allowance to be made for perspective, but it is so small that in this case it can be disregarded. In focussing very high subjects some difficulty will be found in getting bottom and top in focus at the same time, especially if the lens is strained by either altering the position of the back or front of the camera. The best place to focus is a little above the centre of the screen, so that when stopped down, the bottom of the building is quite sharp. A slight softness is scarcely noticeable in the final print. Here I would strongly advise the use of a small stop in all exterior work. There is no necessity whatever for using large apertures; the smaller the better.

As to the exposure of exteriors no correct guide can be given. It will vary between five five seconds to ten minutes with *f*-64.

If people are continually passing and repassing, then give a longer exposure; this will, as a rule, completely obliterate them. In practice I have found an exposure of fifteen seconds entirely destroy all trace of moving objects. Here, again, the use of a small stop is advantageous, enabling you to prolong your exposure, which you could not otherwise do. Another method of making an exposure where there is an enormous traffic past the building, and perhaps people standing about whom you cannot very well ask to move, is to break the exposure as many times as possible. Expose for two seconds, then wait until the traffic has somewhat altered, then give another two seconds, and so on till finished. By this means I

have photographed buildings in the very heart of the city without a trace of anybody showing in the negative. Besides people crossing your view, the worker is often troubled with individuals of another character, namely, street boys, loafers, and other "gentlemen" having more time on their hands than they quite know how to profitably employ, and therefore form the nucleus of a small crowd anxiously awaiting the impressive moment of uncovering the lens. A good remedy for this evil is to carefully, and with grave deliberation, proceed to roll a cigarette. The crowd will completely melt away before this interesting operation is finished.

Having successfully photographed the exterior and its details, we try the interior and must, *of course*, start with the general views.

To produce successful photographs of these, one or two precautions are necessary: Do not photograph from exactly the centre. Place the camera slightly to the right or left of the centre aisle. It is also advisable to obtain more of one side of the object than the other. This is usually done by swinging the camera round. I would suggest instead that the sliding front be used, and the camera kept as parallel as possible with the sides of the building. This places the near object in better relation, and the centre point of the building is better preserved. As an illustration of the use of the sliding front, you have before you a print of

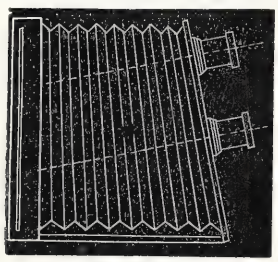


FIG. 8.

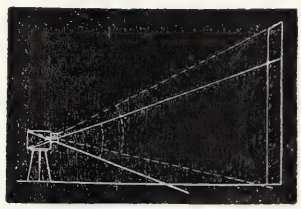


FIG. 15.

Trinity Chapel, Canterbury Cathedral. Now, if I had placed the camera exactly in the centre, I should not have been able to give the idea of the length or the distance between the west window and the columns; also, if I had placed the camera on one side and then twisted it, the two columns would have gone off in perspective. But, by keeping the camera parallel with the building, and sliding the front along until the picture was central on the screen, I accomplished that which I was aiming at, which was to give some idea of the length of the cathedral, which is the longest but one in England.

In focussing dark interiors, do not forget objects in the near foreground. When focussing, one is apt to overlook the dark foreground if there happens to be a light object in the distance, the consequence being that the resulting negative is considerably out of focus in the near portion. Exposing interiors is certainly a rather difficult subject, and is a point on which a great many people fail. As a guide, I suggest the following, which in practical use I have found invariably correct: Stop down the lens until, without any great effort, you can just see all the picture on the screen, and, using a plate of the rapidity of Mawson & Swan's "Castle" or Cadett's "Ordinary," give an exposure of ten minutes. The exposures for the other stops can then easily be calculated. Thus suppose you can see the image all over the screen at *f*-22, the exposure at *f*-45 would be forty minutes, *f*-64 eighty minutes. If in any doubt always allow a liberal margin over the longest computation. Over-exposure is easily remedied—an under-exposed plate is almost useless. These times are for unbacked plates; backed plates I should give twenty per cent. more.

If halation is expected, the best method is to give a very full exposure, so that the plate does not need forcing in development. If it is forced, and halation should be present, it is almost sure to show very badly.

In photographing old oak, remember that you are only photographing points of light reflected from the surface, and therefore should give a generous exposure on a quick plate, and one capable of yielding a soft image.

The worker, who in the summer selects our principal cathedrals as his subjects will be greatly hampered by the number of visitors. I particularly noticed this when working at Canterbury. The whole time I was in the choir there was a constant stream of people. They were taken round in batches in charge of a verger and always started at the choir. When a certain number had assembled, sufficient for the verger to exercise his chaperonic offices upon, a procession was formed. The verger was in the van. With, serious, solemn and stately step he led the way; he was followed by the sight-seers, meekly, humbly, almost nervously, following their mentor just as sheep follow a tinkling bell. No sooner had the tail end of one procession moved off than another followed in its wake; there seemed a never-ending flow of people and an inexhaustible supply of vergers. For hours and hours the monotonous performance was repeated, and perhaps accounted for the settled melancholy look of the Canterbury vergers. It commenced before I arrived, and was going strong and well when I left, and, for aught I know, may have continued without intermission to this very hour. I gave one-and-a-half hour's exposure, and by carefully dodging the crowd, managed to obtain a negative without a trace of their interesting personalities. So long as the people keep on the move, you can go on exposing; when they stop, put on the cap. It requires a good deal of patience, but photographers are supposed to cultivate that estimable virtue.

In composing domestic interiors, it is as well, as I have said before, to be guided by the appearance which the view presents on the screen. The foreground is always hard to fill satisfactorily, having a crowded appearance, with perhaps a chair or table, but, on the other hand, appearing empty without anything. Here is where the worker will be able to show his power. While one man will arrange his subject in a satisfactory manner, another will only produce a showroom of furniture-shop effect.

In some subjects it is perhaps necessary to include one or more windows; this can, of course, be accomplished by the aid of backed plates, but it is always better to block those particular windows out. This is usually done by covering the outside with black cloth or brown paper, or pulling the sun blinds down. To get the effect of the window, you must remove the paper or cloth at the end of the exposure for a few minutes, three minutes being generally sufficient. By this means it is possible to show the landscape as seen from the window.

If you have light coming from one direction only, there will be a quantity of dark shadow to overcome, which will necessitate very careful grouping of the furniture in order to produce a satisfactory picture.

Do not place your camera too high; four feet to four feet six inches is quite sufficient. If the camera is higher, you look over the immediate foreground objects, and touching the ground past them, which is undesirable.

In exposing on all such interiors, I would strongly recommend a very full exposure, for, as stated above, your object must be to flatten somewhat the resulting negative. A great thing to study in this branch of work is the careful lighting of your subject. This can be varied by the use of the ordinary inside blinds, also by the sun blinds found outside many rooms. It is *not* advisable to draw the blinds up to their fullest extent. By so doing you accentuate your cast shadows. In fact, the softer the light in the room, coupled with a corresponding exposure, the better the result. Another point to notice is that a comparatively dull day is often the best for interior work, the light being much softer and subdued. As a slight guide to exposure, I would suggest that an additional thirty-five per cent. be added for Church work to that given above.

4. *The Development and After-treatment of the Negative.*

We now arrive at the final and, perhaps, the most interesting stage of our negative. It is in the development of our subject that we are able to realise the outcome of our labour, whether good, bad, or indifferent.

To be a good and careful developer should be one of the chief aims of every worker, and nothing is so likely to dishearten the young photographer as to be unable to develop his plate in a satisfactory manner.

The developer which my remarks are based upon, and the merits of which I am acquainted with more than any other, is our old friend pyro and ammonia made up in stock solutions as follows:—

Pyro	1 ounce.
Sulphite soda	3 ounces.
Water	10 ounces.

Dissolve the sulphite first, then add it to the pyro.

Bromide of ammonium	1 ounce.
Water	10 ounces.
Ammonia ·880	1 ounce.
Water	9 ounces.

In giving this developer, I do not state that it is the *best* developer for this class of work. Both pyro-soda and pyro-potash yield splendid results. I fancy that with either of the last-named you get more general detail without so much density; but, as their action is so slow, you cannot force portions of the plate so easily as you can with pyro-ammonia.

For general exterior work—pyro solution, 30 minims; bromide, 20 minims; ammonia, 10 to 15 minims to the ounce of developer is a good proportion to start with, afterwards adding ammonia as required. If the subject is full of contrast, lower the pyro and bromide to one-half,

developing the plate as quickly as possible, which will tend to yield a softer image. On the other hand, if the subject lacks contrast, you may double the quantity of pyro. In fact, I have used up to eight grains to the ounce with satisfactory results.

Interiors are best started with a weak developer; by which, I mean weak in all its constituents. This will bring out the detail without causing very much density in the high lights. This treatment will only yield satisfactory results with subjects which have not been what I should call much over-exposed, otherwise you will get flat negatives, and it will be found almost impossible to gain enough density.

If the subject is light, or is known to be very fully exposed, use a developer strong in pyro and weak in bromide and ammonia, bringing the image up as slowly as you can, so that you gain all the relief possible. If portions of the plate refuse to develop under the ordinary treatment, take a smaller measure, in which place a few drops of ammonia ·880, fill up with water, and then pour on and off those portions which you desire to hasten. Or perhaps an easier method is to flood the plate with this ammonia water without washing the developer out of the plate, then pour off and once more flow the developer over without any intermediate washing. In some instances windows or other bright objects show halation early in development. In such cases disregard it for the time being, and develop as quickly as possible, trusting to local reduction afterwards to give you a presentable negative. In subjects that develop very quickly, showing palpable signs of over-exposure, you should fix the plate as soon as all details are well out and before the image veils over, afterwards intensifying. This will give you a clean and bright negative.

For some subjects quick development is advisable, and greatly lessens the contrast. To do this properly, one must know his subject thoroughly, otherwise failure will certainly result. This is not a method I should recommend to the young worker, but only to the man well up in this branch of his work. White marble buildings (exterior) in brilliant sunshine, or subjects which are full of strong glare, are best so developed.

If your plates are suffering from severe under-exposure, an amidol developer may be used to bring out all possible detail, afterwards using pyro for density. A good formula is:—

Amidol	20 grains.
Sulphite soda	40 ,,
Ten per cent. bromide potassium	10 drops.
Water to	5 ounces.

Make up just before using.

A word as to judging the density of the negative. If you are developing with a very weak solution, bear in mind that, although the plate may appear quite hard when looking through it, yet when it is fixed it may possibly be very thin.

When you are using a developer strong in pyro, density will be gained easily, and the plate will fix as hard as it looks. Rapid plates gain density much quicker than slow ones, although in the dark room it appears to be the other way about. Backed plates also appear *much* harder and denser before fixation than they really are.

After fixing, if the plate is yellow from prolonged development, you can quickly remove the stain by placing the negative for a few minutes in the following solution:—

Chrome alum	1 ounce.
Hydrochloric acid	2 drachms.
Water	20 ounces.

This will keep for any length of time, and can be used over and over again.

For reducing, either locally or generally, Howard Farmer's ferridcyanide and hypo reducer works like a charm. Use a small piece of cotton-wool, and bathe the parts it is required to reduce.

After the negative is dry, if it is inclined to print hard, cover the back of the plate with matt varnish; then scrape away those portions that appear very dense. If this is insufficient, mineral paper may be placed on the back, and the hard portions cut away. Several layers of this can be used until the desired effect is produced. This papering of the negative, if carefully done, will effect great improvements, details which before refused to print yielding under its influence.

On printing I will say but little. The type of paper used depends upon the taste of the worker. Platinum, carbon, and matt-surface chloride papers all give very fine results. Platinum, giving a longer range of tone values, is perhaps the best for this class of work. I strongly urge you not to print architectural subjects on rough paper. Much as I appreciate the use of rough papers for landscape work in a pictorial sense, yet I cannot but cry out against using such papers for subjects which depend entirely on detail for their success.

Gentlemen, I hope I have not tried your patience too much. To some this paper may appear rather long, but, in dealing with a subject possessing the manifold and almost boundless possibilities of architectural photography, it is necessary to examine questions from various standpoints.

I do not claim infallibility for the methods I place before you, and in submitting them I do not in any dogmatic spirit urge their adoption. The utmost I can claim is that my paper represents my experience, and that experience has been gained by working under every conceivable condition. If its recital and any further explanations I can give tend to help those who have not had my opportunities of investigating this most interesting and valuable branch of photography, I shall feel perfectly justified in having taken up so much of the Society's time.

JOHN H. AVERY.

ON THE AVOIDANCE OF REFLECTIONS IN COPYING.

II.

IN a former article I referred to the advantages obtained by using long-focus lenses in copying, and showed how, by their employment, reflections emanating from the sides of the picture were obviated. These very frequently take the shape of the window sashes or other portions of the room in close proximity to the source of light.

It frequently happens, however, that difficulty will be experienced with reflections from objects in a direct line, or nearly so, with the picture. These may be traced to the presence of any bright objects in the room. A golden rule to follow when undertaking work of this description is *to have nothing to reflect*, and, where possible, a room chosen that is well adapted for the purpose. Any ordinary-sized room having one window, and which faces to the north, will, during the fore part of the day, answer admirably; for, as a rule, there will always be some portion of the room that has a decided dark corner, and for this work the darker the better, and, should the walls be papered or painted with a sombre hue, it will also help materially to keep down reflections.

Under such conditions let the picture be placed at such a distance from the window as will permit of the camera stand being placed well away from the light of the window, in what I have termed the dark corner of the room. This, in some cases, may mean a distance of several feet where the size of the picture is considerable; but, with long-focus lenses and the camera hidden away as it were in the dark, it will permit of the glazed surface of the picture being turned well round towards the light until the point is just reached where it cannot face more directly without showing reflections. This will be found the extreme limit for the particular size of lens being used, but with a lens of tolerably long focus it will be found that the picture is facing the source of light sufficiently well as to permit of a very evenly lighted surface being obtained.

I have said that a golden rule to follow is to have nothing to reflect. Of course, where fixtures are present of such a class that it is impossible to remove them, much may be done to prevent reflections from such by simply covering them up with some dark material. This may refer to bright articles, such as gilded picture frames or framed engravings. Removal, however, is always the safest line to follow if at all possible. The brasswork fittings of the camera must be attended to also, and a very simple contrivance is to provide a piece of cardboard of a size larger than the front of the camera, cut an aperture out that will just permit the card to fit tightly on to the hood of the lens, and then proceed with the aid of a little lamp-black mixed up with a small quantity of glue to blacken over the face of the cardboard. This will cover up, when placed on the hood of the lens, every particle of brasswork, even the lens itself, and prevent any reflections being thrown back on to the picture. When everything has been done in this respect, should the operator be wearing white-linen shirts, let him button up so as to show not even a white collar. When such precautions are taken there will be no ghosts in the resulting negative.

In cases where the room selected for the work has more windows than one, let there be no hesitation in closing up the one least suitable, and be most particular to have the room as dark as possible behind the camera. Any one who undertakes this work for the first time under such conditions will not be long in finding out the comfort and advantage of shutting out all direct front light.

A good copying board of sufficient length is also another great comfort. It will enable a worker to place his camera without any trouble, so as to have no distortion in the resulting picture. I have seen more trouble arise over this matter than any one could well

believe, but with a good *long* copying board, having lines drawn across its surface at distances of one foot apart, the camera is placed square on, without any trouble or loss of time or temper.

To those workers who have not facilities for undertaking such work in suitable places indoors, I would suggest the advisability of outside situations, for there is no doubt in large towns and cities most excellent copying can be done in many back courts and alleys, and I know of one gentleman, who annually photographs hundreds of paintings, who invariably makes all his exposures in the open air. The spot selected is virtually a well in a back yard—*i.e.*, the yard is surrounded on all sides by high buildings. My friend claims that he can produce negatives with a better range of tone from the various colours of the pictures, and gets far better detail than when working indoors. Reflections are avoided by a careful selection of the best point to place the pictures in relation to the source of light and the use of long-focus lenses. T. N. Armstrong.

PHOTOGRAPHY AND ARCHÆOLOGY.

Part II.—Photography as Applied to the Different Branches of Archæological Study.

In my last article I pointed out and considered in some detail the various important advantages which render photography so valuable an accessory to the practical archæologist. I also gave an outline of the principal difficulties with which the archæologist has to contend, with the object of showing how, by the adoption of this art as an auxiliary to his inquiries, he may reproduce in a pictorial form many of those evidences of the past which are in hourly danger of being swept away by one or other of the many adverse influences to which they are exposed. I now propose to give a short summary of the chief branches of archæological research, and to point out how, through the services of the camera, the work of specialists in each of those branches may be made to conform to scientific methods of investigation.

The domain of archæology is such a wide one, that, for the purpose of facilitating the study of the science in its smaller subdivisions, it is customary to divide it into certain large sections which, while possessing many features in common, exhibit an individual unity that entitles them to independent treatmeut. The most natural division would seem to be the separation into eras. In many cases this may be combined with a division founded on geographical distribution. As I here intend to confine myself to the archæology of the British Isles, I shall adopt a tripartite division on the former lines, which has the advantages of convenience and simplicity. In accordance with this scheme, I propose to consider the subject under these eras, the Early, the Mediæval, and the Modern.

By the Early era I wish to be understood as referring to that vast period of time extending downwards from the earliest pre-historic ages of which memorials are found to exist to the year 410 A.D., when this island was finally abandoned by its Roman colonists. The Mediæval era will embrace the next thousand years, or, roughly speaking, those centuries contemporaneous with the rise, progress, and extinction of the feudal system.

The Modern era will, in like manner, denote the period extending from the middle of the fifteenth century to our own times.

The memorials of the pre-historic ages do not, as a general rule, present many features of interest to the photographer. This is mainly due to the great similarity that characterises the relics of this period. There is an absence of individuality about these early memorials, which, however accurately it may reflect the every-day life of primitive society, is found a disadvantage when they come to be considered from a purely pictorial standpoint. There, are however, a few exceptions. Amongst these I may mention megalithic circles, especially those in which some regard is paid to structural principles (as, for instance, in Stonehenge); personal ornaments of gold and of bronze, exhibiting decorative devices; and the few sculptured and inscribed stone monuments that can be assigned to this early era. The photographer who confines his attention to the archæology of the pre-historic period will find these three classes of remains among the most suitable for reproduction.

The relics of the Roman period are of a much more interesting character. They are rich in illustrations of all that concerns the civilisation of the invaders, in customs, polity, and arts. Apart from this, they have a particular value for us on account of the light that they throw upon the early history of this island—a history to which the references in the pages of the contemporary historians are so few and so obscure. Much may be done by photographers towards the illustration of the remains of this important period. Our Romano-British antiquities may be be divided into two great classes, the *military*, and the *civil*. Under the former head must be included the many varieties of fortifications, as temporary and stationary camps, walled towns, watch-towers, barrier walls, and the like; also military roads, milestones, bridges, aqueducts, granaries, and all similar works of legionary construction; and, lastly, miscellaneous relics, such as arms, armour, *vexilla*, and centurial stones.

Remains of this class are often highly effective subjects for the camera. Witness (to take a few illustrations at random) the *pharos* at Dover and the multangular tower at York, the Portway at Lincoln, the foundations of the great bridge over the North Tyne at Corbridge, the stationary camp at Ardoch, and the town walls at Leicester, Richborough, and Wroxeter.

The memorials of the civil life of the Roman invaders are both numerous and valuable. Of these the foremost place must be given to the inscriptions. These are mainly of two kinds, namely, altars, or votive tablets, and sepulchral monuments. The greater number belong to the latter half of the second and the beginning of the third centuries of the Christian era, though examples both of an earlier and a later date may be met with. The lettering is often of a curiously complex character. This is particularly the case in most of the inscriptions of a date posterior to the accession of the Emperor Severus. In these abbreviations are of common occurrence, and ligatures, or tied letters, are very freely employed. The transcription of such inscriptions is, consequently, often a matter of some difficulty. Photography may here render invaluable service to the antiquary, for by its means he may readily obtain perfect facsimiles of these historical relics. Very little has yet been done in this direction. Hundreds of inscribed stones of the Roman era, in the form of altars, tombstones, coffins, and monumental tablets, few of which have been photographically reproduced, are permitted to lie hidden in obscure local museums and amongst the miscellaneous lumber of private collections. These, in a pictorial form, might easily be made accessible to students of this period of British history, and their collection may be advocated as falling within the legitimate province of the photographer.

Next in rank come the sculptures and remains of statuary in stone, marble, and bronze. Memorials of this character are found in abundance on the sites of most of the Roman colonies and camps in England and Scotland. These are valuable as illustrating in considerable detail the manners and customs of the age. The execution, though rude, is often spirited, and is sometimes commendable for its artistic qualities. Here, again, the photographer has a good opportunity to distinguish himself in the field of archæological research.

The beautiful mosaic pavements of the Roman era next call for attention. Southern England in particular is rich in the possession of these relics of imperial times. They are generally found on the sites of the villas which, during the latter part of the Roman occupation of this island, sprang up in such large numbers in the urban districts of the more civilised provinces. These pavements are often of exceeding delicacy and beauty. Many of them (as at Silchester and Caerwent) are remarkable for their rich geometrical designs, formed of interlaced knot work and coloured tiles. Others, again (as at Frampton, in Dorsetshire) exhibit figure groups of a mythological character. On a pavement discovered at Cirencester, we meet with highly realistic representations of flounders, eels, shrimps, crabs, and other denizens of the deep. It is, unfortunately, almost impossible to preserve these mosaic pictures in their original condition. In an exposed state they are very susceptible to the action of the elements, and will seldom resist for any lengthened period the destructive influences of cold and frost. Under these circumstances the camera—that unfailing resource of the archæologist—must again be brought upon the scene.

The list of Romano-British antiquities would be incomplete without some mention of the principal public and private buildings of the period. These include temples, public baths, basilicas, theatres, amphitheatres, villa residences, hypocausts, shops, inns, and posting-houses. Most of the remains of this class are little more than fragments. They are, however, far from deficient in archæological interest, and, on this account, seem to deserve the notice of the photographer.

Lastly, we have the smaller relics of the Roman age, among which I may mention coins and medals, personal ornaments, pottery and glass ware, domestic implements and utensils, and all like memorials of the portable class. In proportion as these are interesting as illustrating the state of the industries and the arts during the Roman occupation of Britain, they will be found suitable subjects for reproduction in the camera.

I now pass to the consideration of the archæology of the mediæval era.

Ecclesiology is, perhaps, the most interesting and important branch of archæological inquiry in this period. Nowhere can the

growth of native architecture be studied to greater advantage than in the remains of our cathedrals, abbeys, and ancient churches. Most of the larger edifices of this class have been carefully examined and described again and again. Antiquaries have, however, concerned themselves less with the details than with the more prominent architectural and structural features; and, consequently, until the former have received their due share of attention, it cannot be said that these buildings have been properly and sufficiently examined.

The smaller churches, in the few cases in which they have met with notice, have been studied in a very superficial manner. Yet of no class of our national antiquities may more numerous examples be found, and of none can it be affirmed that the results to be obtained will more amply repay the labours of the investigator.

In all such cases photography will be found a trustworthy and efficient auxiliary. Our minor ecclesiastical antiquities are no less deserving of attention. In the first place, we have those of a sculptural character—fonts, shrines, sedilia, choir screens, pulpits, and tabernacle work—many of which are among the finest extant specimens of the workmanship of the mediæval period.

Of early wood work we have also many vestiges, in the form of carved stalls and canopies, rood-screens, desks, and muniment chests.

Early metal work, though less common, has its representatives in alms dishes, lamps, candelabra, clocks, vanes, and weathercocks.

A branch of archæology, which has received the name of campanology, is wholly devoted to the study of our church bells.

Communion plate is among the other relics of this class, which are of sufficient importance to merit special examination and independent treatment.

In the category of remains of a decorative character, stained glass occupies the leading place. The subject has received little attention from ecclesiologists, no doubt on account of the apparently insurmountable difficulties which here confront the draughtsman. Now, however, that the camera is capable of supplying his place, there is no longer any excuse for the continued neglect of this important branch of ecclesiology. Of stained glass, considered apart from its connexion with ecclesiastical antiquities, I shall have more to say when I come to speak of heraldry. Fresco and mural paintings are, perhaps, the only other evidences of decorative art likely to be met with by the photographer.

So much, then, for the antiquities of the ecclesiological class. The field, as it will be seen, is a very wide one, and the facilities therein offered for photographic work are as ample as can well be desired.

The military antiquities of the period are, as might be expected, of an equally interesting character. Castles of every description are met with in abundance—the gloomy Norman keep, the Edwardian fortress with its courtyard and circular flanking towers, and the more elaborately planned baronial residence marking the era of the later Plantagenets—few of which are so entirely featureless as to be unworthy of the attention of antiquary or photographer. Mediæval arms and armour form another branch of study. They are illustrated in the fullest manner in the sepulchral memorials of the age: in incised grave slabs, in monumental brasses, and in the sculptured effigies which so frequently adorn the altar tombs which still remain in many of our ancient churches.

Such monuments are valuable, too, for the important information which they afford us in that department of archæological inquiry which is commonly, though improperly, termed *heraldry*.

For decorative purposes, shields bearing armorial devices are usually very freely employed. Similar ornaments frequently occur on the richly sculptured capitals, corbels, and bosses which form such prominent features in the ecclesiastical architecture of the later Gothic style.

The art displayed in the treatment of these conventionalised devices is often of a high standard, and the delicacy of the workmanship is, in many cases, of a kind to which the camera alone is capable of doing justice. Early heraldry may also be profitably studied in the richly emblazoned stained glass windows which are still permitted to adorn some few of the chantry chapels attached to our cathedrals and collegiate churches. In the waxen seal impressions commonly appended to charters and documents of the mediæval era, as well as in the matrices or seals proper, we have additional materials for the investigation of this interesting subject. Our early illuminated manuscripts, too, are often rich in illustrations of an armorial character.

Leaving the antiquities of this period, I come to those of the modern era, the third and last of my proposed divisions.

The chief feature of this era is, of course, its architecture, which, both on account of its variety and its ornate character, merits the most careful examination. The baronial edifices of this period have a special interest for the archæologist, as they serve to illustrate very happily the gradual transition that led up to the introduction of domestic architecture. The smaller remains, too, should not be neglected. Antique crosses, such as may be found in the market-places of our smaller towns, or by the wayside in our country districts, may be mentioned among the vestiges of this class. So, too, the sculptured fountains and sundials that serve to ornament the gardens and lawns of so many of our ancient halls and mansion-houses. The list might be greatly extended, but I think I have already sufficiently indicated how abundant are the facilities here afforded for systematic photographic work.

In the department of genealogical research, the camera will be found an auxiliary of no mean importance. It will furnish the genealogist with valuable illustrations of his subject in the form of reproductions of family portraits, and facsimiles of epitaphs, autographs, and early handwriting. By its means, also, the painted pedigrees which adorn the interiors of certain of our ancient baronial halls may be made accessible to the student.

Topography, considered in its archæological aspect, is another branch of inquiry in which the services of photography as a copying agent cannot well be dispensed with. It is, however, now necessary to conclude this very imperfect sketch of the various items that go to make up the sum of our national antiquities. The scientific study of these remains may, as I have endeavoured to point out, be greatly advanced and facilitated by the adoption of photography by the practical archæologist.

The photographer, too, who is inclined to regard his art rather as a means than as an end, will find these early memorials well worthy of his attention. He should not, however, forget that, for the successful undertaking of all work of this class, a certain amount of preliminary knowledge is necessary. This he may obtain from the various technical handbooks, dealing with practical archæological research, which of late years have made their appearance.

He should confine himself to a single branch of study, and endeavour to treat it in as exhaustive a manner as his opportunities afford. Should he find his choice of subjects too limited, he may, however, go to work upon another plan, and, selecting a particular parish or district, attempt to make a general photographic survey of its principal objects of antiquity. He should also strive to make himself acquainted with what has already been done in his chosen field of inquiry, in order that he may be able to concentrate his attention on the special points that have been neglected by his predecessors. In the transactions of local archæological societies, as well as in county histories and topographical works, he will meet with much valuable information having a practical bearing on the work in which he is engaged. Logical principles demand that he should devote a portion of his labours to the illustration of the life of the present day, which, it must not be forgotten, will in its turn come to possess an antiquarian interest of its own. Finally, he should bear in mind that success in this, as in any class of photographic work, is the result of a definite system working towards equally definite ends. Let him remember that his special aim is, or ought to be, to perpetuate for the eyes of posterity the numberless relics of the past that are in danger of falling into oblivion.

MATTHEW WILSON.

A LARGE OUTING.

[By our Special Outist.]

AT half-past two on Saturday afternoon, June 16, Waterloo South Station was invaded by a small battalion of photographers armed with cameras ranging in size from the lilliputian quarter-plate to the lordly and leviathan 12 × 10. The occasion was the first outing of the Central Photographic Club to Leatherhead, and, besides that august body, the Photographic Club, the London and Provincial, the Photographic Society of Great Britain, the Sonth London, the Hackney, the North Middlesex, and other Societies had sent their best and brightest representatives. There were also many charming ladies present. As our train backed into the station, the excitement was immense. Friend Slater had secured two reserved carriages for us, and ere the train stopped we tumbled gaily into our seats, close upon a hundred strong. The windows were promptly adorned by Brother Oakden with labels, upon which the words "Central Photographic Club" were boldly inscribed; off we steamed, a galaxy of photographic rank, talent, and beauty, and "Bright the light, shone o'er fair women and brave men" [*Byron* up to date].

The journey down was enjoyable and instructive to all the occupants of our compartment, I am sure. To some, I believe, it was profitable, for the inevitable talk cum tobacco was sweetly interspersed by a careful study of about fifty-two samples of the most popular colour process of the day, with which one of our number, with great forethought as to our

artistic tastes, had provided himself. Personally, I was distinctly the richer by the passing round of such undoubted objects of interest. Linguistic incidents also freely characterised the journey, but the harmony was never in jeopardy, for everybody agreed to rescind everything or anything with the utmost readiness. While the train was going at its highest speed, Friend Slater, at the imminent risk of his life, suddenly appeared on the footboard, dived into our compartment, and handed us our tea tickets. A motion for his expulsion was then put and carried *nem. con.*, but he disappeared with the agility of a harlequin, and the peace was not disturbed.

We duly detrained at Leatherhead at 3.30. The weather was extremely disappointing—there was no fault to find with it. Holy Moses! What a crowd of photographers, photographers' wives, sisters, cousins, aunts, &c.! What a motley collection of photographic apparatus streamed out of the station! Leatherhead rubbed its eyes with amazement. We smacked our lips with—something else. Off we trailed, splitting up into thirty or forty small parties of twos and threes, through the hilly and serpentine streets of the clean, old-world, cosy, little town, a blue sky overhead, the earth bathed in bland sunshine, the trees and fields looking their greenest and freshest. Our party consisted of three: an esteemed avuncular relative of mine armed with a hand camera; a cameraless and frivolous wight who was grateful to me for having relieved him of some of his superfluous luggage on the journey down, and myself, plus a camera, four lenses, a dozen slides, and numerous accessories. In return for my kindness to him, the Frivolous One graciously offered to carry some of my apparatus, and in a trice he had filled his pockets with lenses, shutters, caps, extra fronts, yellow screen in case, stereoscopic division, camera case on his back, and the camera and legs gracefully disposed over his shoulder. "Here," exclaimed I, in a burst of enthusiastic appreciation of his generosity, "here at last is a man who has nobly profited by the Divine counsel to bear one another's burdens." But soft—I anticipate. Arrived at an ancient edifice occupied by a devout and simple son of St. Boniface, it was proposed by Uncle, seconded by the Frivolous One, "That we do proceed to explore the interior of this ancient edifice, for the goodly purpose of making a practical analysis of the contents thereof (if any)." This was duly put, and carried *nem. con.* It was not rescinded—not if *we* knew it.

"We stood on the bridge at Leatherhead
As the clock was striking the hour,
And the sun shone e'er the village
With great actinic power."—LONGFELLOW, *improved.*

A charming view of winding stream, mead, trees, and an old mill is to be obtained from the river level at the bridge. I have been there before, and so we at once made for the spot. I surmised that I should have it all to myself. I was only partly correct in my surmise. Upon our arrival about thirty cameras occupied the coign of vantage, and it was fully twenty minutes before I could get an opportunity of uncapping. Having made a couple of exposures, the Frivolous One and I went in search of Uncle, whom we found gracefully taking snap-shots while supporting the parapet of the bridge. At this stage of the proceedings I became the victim of a hole-and-corner conspiracy. Brother Oakden, with a villain-of-the-piece-like air, invades the peaceful scene. He carries a 12 × 10 camera, *au grand complet*. The group is to be taken with it. With a wily and seductive smile he hints that, if the Frivolous One would like to carry the big camera he (the Frivolous One) may have the privilege of exposing two of the 12 × 10 plates. The Frivolous One, fired with the poor ambition to do big work, succumbs to the bait, and grandly permits me to carry my own traps. But—ha! ha! revenge is to be mine.

Meanwhile we three explore the stream, threading our way through the forest of cameras, and I obtain other stereoscopic and single views in and around the river. We meet a small party, the spokesman of which kindly directs us to a picturesque park and church, two miles off. Uncle thereupon addresses the crowd. Says he, "I have come out to enjoy myself, and not to make a walking tour of the entire county against time." We mollified him by gently leading him to a placid lake, dotted with water lilies and swans. Of course I have been anticipated, the banks of the lake are fringed with cameras. After the exchange of a few improving stories and puns with Professor Fall, I secure a view of the lake. Then the Frivolous One, after borrowing a focussing cloth, essays to make an exposure. I mildly hint that, if he sufficiently underexposes, and prints the negative on rough paper, the subject will be an admirably Salonic one. He hesitates. I proceed, "Twelve-ten plates cost 12*s.* per dozen. Why waste a shilling in these hard times?" He relents; I have conquered. The world is saved the infliction of at least *one* fuzzygraph. So the golden hours slip by. Uncle proposes a confirmation of the aforesaid analysis. We agree, and so back to the bridge. Total distance traversed from the station: about 400 yards.

Towards evening the wanderers return, and we all make our way back to town, where, in the grounds at the rear of the tea place, the all-important group is to be taken by Professor Fall. There are some cycling ladies in rational costume, and we tremble lest the novel figures are to be included in the group. The catastrophe is averted. The Professor disposes us in amphitheatrical fashion, and thoughtfully places me among a group of ladies. Then he makes us all look pleasant by telling us funny stories. All is ready, when, horror of horrors! the 12 × 10 plates are not to hand. Ha! ha! said I not that I would be avenged? In a moment of weakness, the Frivolous One parted with them to a friend who has not returned. My plot had succeeded. There is a period of agonising suspense, which the Professor skilfully bridges over with more humour, and then three exposures are made, "in case the first one was not successful." Next comes . . . . Tea!! And what a Tea!

Mr. Sebastian Davis takes the chair. Uncle, Friend Slater, the Frivolous One, Brother Oakden, and myself place ourselves near some ladies, with an eye to early annexation of the cup that cheers. Nearly a hundred are present. It is a merry, merry meal, for our appetites are good and the commissariat department is in a state of admired disorder. We commence with lettuces and bread and butter, then comes cake, next eggs, then jam, meat, cucumber, and then some of us (including the Frivolous One and Uncle) are darkly suspected of going all over the ground again. I provide myself with a wholesale working "stock" early in the proceedings. The Professor and Friend Slater become assistant waiters for this occasion only. The ladies appear to enjoy themselves, the laughter is unceasing, the fun unforced and pure; but by-and-by the hush of appeased appetites falls on the assembly, the tea is over, Mr. Sebastian Davis and Mr. Slater are congratulated for their efforts in making the outing a grand success, and so we break up, and, to the accompaniment of pleasant chat and tobacco, we seek the station for the return journey.

"When the heart of a man is oppressed with care, Mr. Boffin," there is nothing like a photographic outing and good company for removing the load. We have all had a glorious afternoon's enjoyment, and my aspiration is that good development may wait upon each exposure. I detrain at an earlier station than the majority, and, as the snake-like train glides past me, I wave good night to ten compartments full of smiling and happy-faced people, who look as if they had thoroughly enjoyed their outing. Which leaves me at present.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

DUBLIN MEETING, JULY 9 TO 14, 1894.

THE Meetings and Exhibition will be held at the rooms of the Photographic Society of Ireland, 35, Dawson-street. President for the year: Sir Howard Grubb, F.R.S. Hon. Secretary: F. P. Cembrano, jun., 10, Cambridge-gardens, Richmond, Surrey.

The following are the official arrangements:—

MONDAY, JULY 9.

Small parties will be formed, under suitable leadership, to see the city, and visit and photograph places of interest therein. Opening of the Convention, and Presidential address in the Royal Dublin Society's Buildings, Kildare-street, at 7.30 p.m. Full-dress *conversazione*, at nine o'clock, will be held in the Museum Buildings adjoining, by the permission of the Lords of Committee of Council of Education. It is expected that his Excellency the Lord Lieutenant will be present.

TUESDAY, JULY 10.

Excursion to the Hill of Howth. Leader, Mr. John A. C. Ruthven Will leave Amiens-street Station about eleven o'clock, by special train. The Hill of Howth rises about 560 feet, is situated on the north side o Dublin Bay, and from it magnificent views may be obtained. After visiting the Abbey, which dates from the eleventh century, visitors will be taken through the demesne of the Earl of Howth, celebrated for its fine walks, ruins, and Cromlech; thence by the Cairn Hill, and round the high cliff shore, from whence views of Dublin Bay, Killiney, Dalkey, and the Sugarloaf can be obtained. If time permits, Ireland's Eye may be visited. Return to Dublin about five o'clock. Excursion to Blessington and Poul-a-phouca. Leader, Mr. V. E. Smyth. Will leave Nelson's Pillar about eleven o'clock by tram to Terenure, thence by steam tram to Blessington, passing the picturesque remains of Tymon Castle and Tallaght Church; from Blessington by car to the Rocky Pool, on the Liffey and Burgage, with its ancient stone crosses; thence to the waterfall at Poul-a-phouca, returning about six o'clock. Papers at 8 p.m., at 35, Dawson-street:— *The uses of Photography in Medicine*, by Mr. Andrew Pringle, F.R.M.S. *Colour Photography*, by Dr. Joly. *An Unexplored Field of Photography* (with lantern illustrations), by Mr. T. C. Hepworth, F.C.S.

WEDNESDAY, JULY 11.

General Meeting at 35, Dawson-street, at 10 a.m. Meeting of General Committee at 35, Dawson-street, at 11 a.m. Convention Group on Duke's Lawn, at noon. Annual Dinner and smoking concert at 6.30 p.m.

THURSDAY, JULY 12.

Excursion to Valley of the Boyne. Leaders, Mr. J. L. Robinson and Dr. Cosgrave. Special train from Amiens-street Station, about nine

o'clock, to Drogheda, situated at the mouth of the river Boyne, visit St. Lawrence Gate and Old Walls, the Magdalen Steeple and West Gate, passing the Boyne Bridge and King William's Glen, where the great battle was fought, and, continuing along the river, visit the celebrated Tumuli of Dowth and New Grange, the monastic remains of Mellifont, and the round tower and Celtic crosses of Monasterboice, returning, *viâ* Drogheda to Dublin, about seven o'clock. Papers at 8.30 p.m., at 35, Dawson-street:—*On the Effect of Temperature on Photographic Sensitiveness*, by Dr. Joly. *On a Photographic Sextant*, by Dr. Joly.

FRIDAY, JULY 13.

Excursion to Enniskerry, the Dargle, and Powerscourt. Leader, Mr. J. H. Hargrave. By train from Westland-row or Harcourt-street station, about ten o'clock, to Bray; thence by car, through the Dargle, to Enniskerry; thence to Powerscourt Demesne and the Waterfall, returning to Dublin about six o'clock. Excursion to Trim and Bective. Leader, Mr. J. L. Robinson. By train from Broadstone Station, visit the yellow steeple part of an Abbey founded by St. Patrick, the Castle, the Old Walls, the Watergate and Sheepgate, Newtown Abbey and the Priory of St. John, the Ruins of Bective Abbey, &c., returning to Dublin about six o'clock. Full-dress reception at the Mansion House, by the Right Hon. the Lord Mayor.

SATURDAY, JULY 14.

Excursion to Glendalough and the Seven Churches. Leaders, Dr. Scott and Mr. Werner. By train fron Harcourt-street, about nine o'clock, passing the rocky scenery of Brayhead, to Rathdrum; thence by cars to Glendalough (glen of the lakes), visit the Round Tower, the lakes, St. Kevin's Bed, and the Seven Churches, many interesting relics of early Christian times, returning through lovely scenery to Rathnew, and from thence by train to Dublin. This excursion has been arranged for Saturday in order that members wishing to visit the Vale of Ovoca, or other parts of Wicklow, and able to stay over Sunday, may do so, and it is arranged that the tickets will be available for this purpose. Arrangements will be made to enable those returning to England on Saturday night to reach Dublin in time for the steamer.

PLACES OF INTEREST IN AND AROUND DUBLIN.

Permission to photograph the following places of interest in the city has been obtained:—Christ Church and St. Patrick's Cathedral, Trinity College, the Castle and Courtyard, the House of Lords, the National Gallery, Science and Art Museum, the Zoological and Botanical Gardens, Prospect and Mount Jerome Cemeteries, St. Audoen's Arch, St. Stephen's Green, Royal Hospital, Pro-Cathedral, Guinness & Co.'s Brewery, Inchicore Works, and the Phœnix Park.

Amongst the places worth visiting in the vicinity may be mentioned:—The Phœnix Park, with the Vice-Regal Lodge, the Furry Glen, the lakes, deer, &c.; the Strawberry-beds and the river scenery of the Liffey Valley; Lucan, with its Spa, Leixlip, and the Salmon Leap Waterfalls; Kingstown, with its magnificent harbour, mail boats, and yachting scenes; Killiney and its beautiful bay, strand, and hill, from which grand and far-reaching views are to be obtained.

GENERAL INFORMATION.

Membership.—Application for membership should be made to the Hon. Secretary or to the Local Hon. Secretary. The subscription is 5*s.* per annum, and is due on January 1 of each year. Ladies are eligible for membership.

An Exhibition of Photographs and Photographic Apparatus will be held in the rooms of the Photographic Society of Ireland, 35, Dawson-street, from July 9 to 14 inclusive, between the hours of 10 a.m. and 6 p.m. Members must produce their badge on entering. The public will be admitted by ticket obtainable at the door, price sixpence.

Annual Meeting.—The annual meeting will take place at 35, Dawson-street, on Wednesday, July 11, at 10 a.m.

Group.—The group will be taken, weather permitting, on Duke's Lawn by Mr. A. Werner, on Wednesday, July 11, at noon; size 18 × 15; price, in silver or platinotype, mounted, 5*s.*

Headquarters.—The Hotel Métropole, Lower Sackville-street, will be the Convention headquarters during the meeting.

Dark Rooms.—The Photographic Society of Ireland Dark Rooms, at 35, Dawson-street; Messrs. Curtis Brothers, at Suffolk-street; Messrs. Yeates & Son, Suffolk-street; Messrs. Robinson & Son, Grafton-street; Mr. Thomas Mayne, Lord Edward-street.

Dinner and Smoking Concert.—The Dinner will be held on Wednesday evening, July 11, at 6.30 p.m., followed by a smoking concert. Tickets, 7*s.* 6*d.* each (including attendance, but exclusive of wine), from the Hon. Secretaries. Ladies will be welcome to the dinner.

Signature Book.—Members on arrival are requested to enter their names, full address, and where staying in Dublin, in the signature book in the Council Room at 35, Dawson-street.

SYNOPSIS OF PROCEEDINGS.

Monday, July 9.—No excursions. Opening of the Convention and Presidential Address in the Royal Dublin Society's Buildings, Kildare-street, 7.30 p.m. *Conversazione* in the Museum Buildings, 9 p.m.

Tuesday, July 10.—Excursions (1) to Hill of Howth, leaving Amiens-street Station by special train at about 11 a.m.; (2) to Blessington and Poul-a-Poucha, leaving Nelson's Pillar by tram to Trenure about 11 a.m. Papers, at 35, Dawson-street, at 8 p.m.:—*The Uses of Photography in Medicine*, by Mr. A. Pringle, F.R.M.S. *Colour Photography*, by Dr. Joly. *An Unexplored Field of Photography*, by Mr. T. C. Hepworth, F.C.S.

Wednesday, July 11.—No excursions. Annual General Meeting at 35, Dawson-street, at 10 a.m. Meeting of General Committee at 35, Dawson-street, at 11 a.m. Convention Group on Duke's Lawn at noon. Annual Dinner and smoking concert at 6.30 p.m. Garden Party at the Right Hon. the Lord Mayor's, at Killiney, at 2 p.m.

Thursday, July 12.—Excursion to Valley of the Boyne, Mellifont, and Monasterboice by special train from Amiens-street Station at about 9 a.m. Papers at 35, Dawson-street, at 8.30 p.m.:—*On the Effect of Temperature on Photographic Sensitiveness*, by Dr. Joly. *On a Photographic Sextant*, by Dr. Joly.

Friday, July 13.—Excursions (1) to Enniskerry, by train from Westland-row or Harcourt-street station about 10 a.m.; (2) to Trim and Bective, by train from Broadstone station about 10 a.m.

Saturday, July 14.—Excursion to Glendalough and the Seven Churches, by train from Harcourt-street about 9 a.m. Council Meeting at 35, Dawson-street, at 10 a.m.

Our Editorial Table.

GLEAMS OF LIGHT AND GLIMPSES THROUGH THE RIFT.

By THOMAS SLANEY WILMOT. London: Simpkin, Marshall, Kent, & Co. Birmingham: The Midland Educational Company.

THE author of this book has been an occasional contributor to our JOURNAL and its Annual. In *Gleams of Light* we have a collection of philosophical essays on topics connected with mental rather than physical science. Although the volume contains much of what has been termed supernatural, but which Mr. Andrew Lang in his new book more correctly prefers to call the "rather unusual," the special subject in *Gleams of Light* which will most interest photographers, and which is ably treated, is "Gleam Eleventh," which is devoted to psychic photography, and contains an account of numerous experiments, something over thirty, which are recorded with the requisite fulness, and illustrated by numerous Meisenbach engravings, quarter-plate size, concerning which we would observe that they are well printed on stout, smooth paper, and that many of the psychic figures are quite as sharp and clear, in some cases more so, as are the terrestrial sitters. Of this class of pictures there are about three dozen. But these do not alone represent all the plates, for we find that there are in all no fewer than fifty-two; six of them, whole-plate size, are hand-coloured paintings. It has been known, from the times of Reichenbach, that an aura, invisible but sometimes fluorescent, surrounds certain objects—a powerful magnet, for example. A similar aura is said to surround or emanate from certain individuals, which is further said to be visible to persons peculiarly constituted. This etherealised aura is stated to be of different colours, according to the nature of the object or individual from whom it emanates. In this work we have the application of this to psychic photography and its failures discussed, as also the probable causes of the abnormal appearances of many of the psychic figures when obtained. A photographic journal is not the place for reviewing the numerous other topics relating to the "occult" treated, in a very charming manner, in the pages of this goodly volume of 724 pages. We learn, however, that portions of it are being prepared for being issued in smaller volumes at popular prices, which the present one, limited in issue and sold at five guineas each, can scarcely be said to be. But the whole "get up" of the book—paper, typography, style, and binding—indicates that expense in its production has been quite a secondary consideration.

FALLOWFIELD'S PHOTOGRAPHIC ANNUAL FOR 1894–5.

THE shadow of this goodly annual is very far from growing less. It comes to us this year with 754 pages, and contains every conceivable piece of photographic apparatus up to date. Among the thousand and odd illustrations there are sixteen Swantype pictures, showing what the Facile hand camera is capable of, that must be accorded special praise for their real excellence. Instead of making any attempt to indicate its general features, we would recommend each reader to obtain a copy for himself, and devote a week or two to studying its contents, which are of an encyclopædic nature. He will assuredly find much to interest him.

THE NORWICH LADY AND HER PHOTOGRAPHS.

CASE AT NORWICH COUNTY COURT.

AT Norwich County Court, on Monday last, before his Honour Judge Price, Q.C., an action was tried in which Egmont A. Usherwood, photographer, sued William Hanworth, general furnisher, Dereham-road, Norwich, for 1*l.* 17*s.* 6*d.*—two photographs of pony and trap, 12*s.* 6*d.*; one ditto, 7*s.* 6*d.*; six copies ditto, 15*s.*; and one ditto, 2*s.* 6*d.* 10*s.* had been paid on account, 11*s.* 3*d.* had been paid into Court, which left the amount in dispute 16*s.* 3*d.*

Mr. J. T. M. Palmer, who appeared for the plaintiff, stated the facts of the case as he proposed to prove in evidence, remarking that the wife of the defendant, for whom the photographs were taken, was a very difficult lady to please.

The plaintiff was then called. He stated that he was a photographer, carrying on business in Dereham-road, Norwich. On March 14 defendant called on him, and said he wished him to photograph his wife and her sister in the pony trap, together and separately. They eventually agreed that the picture should be taken "up the Dereham-road," plaintiff contracting to do the job for 12*s.* 6*d.*, which meant one of each. Plaintiff went up the Dereham-road, and the photographs were taken. He had rather more trouble than usual in taking the photographs because the horse was restive, the lady being rather persistent in using the whip in order to "show off" the animal, and he was occupied about an hour and a half. He produced prints from the negative he had taken of Miss Smith (Mrs. Hanworth's sister), which was subsequently disapproved of; the print of Mrs. Hanworth and Miss Smith, taken together, was approved of. He had received no reason for the disapproval of the first-mentioned photograph; it was simply returned, saying it was not accepted because it was not satisfactory.

The photographs were handed to his Honour, who said he saw nothing to take exception to; but, considering the two, he thought the photograph of Miss Smith the better. She was apparently taken in profile. (Laughter.)

Plaintiff, replying to further questions, said that both ladies wore veils.

Examination continued.—At defendant's request he took another photograph of Mrs. Hanworth seated in the pony trap, and this was a very difficult affair, as the pony was more restive than ever. A few days afterwards he received the proof of the photograph back, asking if he could not do a "lighter" face. He did so, and left it with Mrs. Hanworth, who, however, wanted further alterations in the photograph. He accordingly did several rough sketches, but he altogether failed to satisfy her, and sent the photograph back, saying he could not do more. She returned it to him, and so the matter ended. Plaintiff added that seven copies of the photograph which was approved were delivered to Mrs. Hanworth; the proof constituted the eighth. He sent his bill in.

By the Judge: Mrs. Hanworth approved of the photograph in which Miss Smith and herself were taken together. One was taken on a hot, dusty day in March, and the other on a cloudy day in the same month; that accounted for one appearing much brighter than the other.

His Honour, having compared the photographs taken on the different days, said that unquestionably one was much superior to the other.

Plaintiff replied that he could not give sufficient exposure in consequence of the bad light, and the manner in which Mrs. Hanworth would persist in flourishing the whip, which caused the pony to be most restive. For this picture, however, he had only charged 7*s.* 6*d.*, whereas, for the other, he had charged 12*s.* 6*d.*

Mr. Palmer called His Honour's attention to the fact that the picture which he (the Judge) had expressed himself as considering the better of the two, was the one which the defendant had refused to accept.

In further cross-examination plaintiff said that, in consequence of the horse moving, he had to take three plates. Never admitted to Mrs. Hanworth that the plate he supplied was a faulty one.

His Honour expressed his strong opinion that there was no reasonable defence to the action, or, at any rate, one which he felt inclined to entertain. The defendant had made no express contract that, unless the photographs produced were to his satisfaction, he should not pay for them, and now objected to pay as a mere matter of caprice. That defence he could not uphold.

Mr. Miller said he had two photographers to call who would speak as to the photograph which the defendant had refused to accept as being faulty.

Mr. Palmer replied that he had three photographers to call who would swear to the contrary.

His Honour said he certainly did not intend to sit there in judgment of rival photographers. (Laughter.) His decided opinion was that, the defendant having selected his photographer, and that photographer having done his best, without guaranteeing any certain result, the defendant must pay for the work he had done, the charges made for which were not disputed as unreasonable. In fact, his view of the matter was this, that Mr. Hanworth must take his photograph as he took his wife, for better or worse. (Loud laughter.)

Mr. Hanworth: Quite so, your Honour; but I should like to say a word or two.

The Judge: I will hear whatever you have to say, but I cannot see how you can alter my decision. I think you had better submit to my ruling as between man and man, and that is a verdict for the plaintiff for the amount claimed.

Mr. Palmer applied for costs on Scale B, and his Honour allowed the application on the ground that the case was one of importance to a large section of the public.

News and Notes.

MR. R. R. BEARD has removed from 62, Alscot-road, Bermondsey, S.E., to larger and more convenient premises at 10, Trafalgar-road, Old Kent-road, London, S.E.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, Tuesday, June 26, *Platinotype Printing.* Mr. F. Hollyer will introduce the subject and give a demonstration. The new daylight carbon tissue will be shown by Mr. H. A. Lawrance.

THE following are the officers of the Kimberley Camera Club for 1894–5:—*President:* Mr. James Lawrence, M.L.A.—*Chairman:* Mr. Montague Thane.—*Vice-Chairman:* Mr. Frank H. Hancox.—*Council:* Messrs. L. Atkinson, J. Childs, and E. Goffe.—*Secretary and Treasurer:* Mr. Charles Howie, P.O. Box 233.

WE are informed that the inventor of the Watkins' exposure meter has worked out an entirely new method of timing photographic development by means of an instrument called the eikronometer. This is a small clock, with a ten-minute dial especially arranged for the new method, and also useful for other timing purposes.

MR. E. H. FITCH has removed from 34, Angel-road, Brixton, to Fulwood's-rents, High Holborn, London, W.C. He expects to have the new factory in full operation by the end of June. On and after July 1 he intends trading as Fitch & Company, and the address will be Seldon House, Fulwood's-rents, High Holborn (opposite Chancery-lane).

THE following are the newly elected officers of the Putney Photographic Society:—*President:* The Hon. Baron Pollock.—*Vice-Presidents:* Mr. H. Kimber, M.P., and Dr. W. J. Sheppard.—*Council:* Mr. F. Chasemore, Dr. J. F. Farrar, Messrs. H. Faulkner, T. Gilbert, W. F. Gorin, William Martin, jun., and L. S. Zachariasen.—*Hon. Secretary and Treasurer:* Mr. William Martin, jun., 4, Lower Parkfields, Putney, S.W.

PHOTOGRAPHIC SECTION, PHOTOGRAPHERS' COPYRIGHT UNION.—The following circular has been sent to members of the Union:—Since we last addressed you, no doubt you have seen in the photographic journals a report of how far we have been successful in obtaining the adhesion of the photographic profession to the proposals we made for the protection of photographers' property in copyright; but, for those who may have not seen the report, we append the same herewith, which was read by our Chairman of Committee at a recent representative meeting of photographers in London. Here follows the report already published. Since the general meeting referred to, your Committee have received many letters of approval, also many letters asking for advice and guidance in dealing with the Press and publishers, and from the points raised your Committee offer the following suggestions:—The minimum fee (10*s.* 6*d.*) is chargeable for cabinet size or under. When the reproduction excceds cabinet size, the fee should be doubled up to panel, and for any size greater there should be a further increase. *Restrictions as to the Use of Subjects.*—When permission is granted for a photograph to be reproduced, the strictest attention should be given to limiting the use of that subject to the one purpose and occasion for which the fee has been paid, so as to avoid its multiplication and sale for other purposes. It is desirable that a uniform form of permission be adopted for the granting of licences, and this we have prepared for the use of members. It is most desirable that all negotiations for right of reproduction should be made direct between the photographer and applicant, and not through any agency. The Committee have prepared a series of forms, under the advice of their solicitors. First, for registration of copyright. Second, for granting permission to use copyright photographs. Third, for the assignment of copyright from the sitter to the photographer. For the benefit of members, a letter of intimation has been sent by the Union to every publisher and every paper and magazine, warning them that, before making use of any photograph, they are expected first to consult the photographer and to ascertain his fee for permission to use, and to give all necessary particulars as to size, process, &c., for the proposed reproduction. After this intimation the excuse cannot be made by the publisher or paper that they were unaware of the photographer's rights. We are desirous of giving what help we can in regard to information, and will answer any questions bearing on the subject which may be addressed to the Secretary of the Union, Mr. Henry Gower, Photographic Trade Section, London Chamber of Commerce. A circular to those photographers who have not yet joined the Union has also been sent out.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Meeting of Delegates, June 13, at 50, Great Russell-street, W.C., Mr. E. Clifton (Photographic Club) in the chair.—A discussion took place with reference to the sending of notices calling the delegates to each meeting, and it was finally decided that notices of meetings should be given in future through the *Photographic Society's Journal*, and that each delegate should be informed by letter that this will be the case, and that no other intimation will be given. It was proposed that the Committee of Delegates suspend their meetings until the second Wednesday in October, but this proposition was lost. The Chairman welcomed Mr. F. Dunsterville, delegate from the Amateur Photographic Society of Madras. A letter was read from the Secretary of the Croydon Camera Club with reference to the matter which has already been recorded. It was agreed that the letter should rest on the table. A letter, which had appeared in the photographic papers, from the Hon. Secretary of the Leytonstone Camera Club, was read, and it was agreed the matter should be dropped. It was proposed by Mr. Grant (West Kent

Amateur Photographic Society), seconded by Mr. Teape (Central Photographic Club), and carried, that a list of the dark rooms at present available should be published in the forthcoming issue of the *Photographic Society's Journal*. A discussion took place as to the publication of information about the various localities provided by delegates, and it was agreed to appoint a committee to edit the same, committee to consist of Mr. Mackie (Photographic Society of Great Britain) and Mr. Welford (Midland Camera Club), with the Chairman, *ex officio*. It was also decided that non-affiliated Societies should be applied to as well. A letter was read with reference to a paper by Messrs. Haddon and Grundy, recently read before the London and Provincial Photographic Association, and it was proposed by Mr. Everitt (London and Provincial Photographic Association), seconded by Mr. Marchant (North Middlesex Photographic Society), and carried, that the Secretary ask Messrs. Haddon and Grundy to place the paper as read before the London and Provincial Photographic Association at the disposal of the affiliated Societies for circulation. In answer to a question by Mr. Grant, the Secretary stated that it had already been decided that a delegate need not be a member of the Society he represents, and it was consequently in order for any Society at a distance from London to appoint any one in London, whether a member of their Society or not, to represent their interests on the Committee. Mr. Thomas (Brixton and Clapham Camera Club) brought up the question of a standard light. The Secretary stated he understood that the Photographic Society had a committee now sitting considering the whole matter of light and speed standards. Mr. Beckett (Hackney Photographic Society) brought up the question of a photographic survey of London, and after some discussion it was proposed by Mr. Coventon (North London Photographic Society), seconded by Mr. Beckett, and carried, that the delegates of the metropolitan Societies be requested to obtain a collection of photographs of objects of interest in their respective neighbourhoods for circulation amongst the other Societies. Next meeting, Wednesday, July 11.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
25	North Middlesex	Technical Meeting.
26	Birmingham Photo. Society	
26	East London	*Flashlight Photography.* Mr. Uffindell.
26	Great Britain (Technical)	*Platinotype Printing.* F. Hollyer.
26	Hackney	Sale and Exchange Night.
26	Halifax Camera Club	
26	Lancaster	
26	Leith	
26	Paisley	
26	Warrington	
26	West London	
27	Burnley	
27	Croydon Camera Club	Twelfth Excursion, to Addington Hills. Leaves Club at 2 p.m.—8 p.m., *On Making the Best Use of Photographic Apparatus.* G. R. White.
27	Leytonstone	Second Annual Dinner, at the Masonic Hall, High-road, at 7 o'clock.
27	Photographic Club	*Modern Developers.*
27	Southport	
28	Glossop Dale	
28	Halifax Photo. Club	
28	Hull	
28	Liverpool Amateur	
28	London and Provincial	Annual Meeting.
28	Oldham	
29	Cardiff	
29	Croydon Microscopical	
29	Holborn	
29	Maidstone	
29	Swansea	
30	Ashton-under-Lyne	Exc.: Lincoln. Leader, Dr. Hamilton.
30	East London	Excursion to Roydon.
30	Hackney	Excursion to Zoo. Leader, G. W. A. Cross.
30	Hull	
30	Oldham	Excursion: Barton for Manchester Ship Canal. Leader, Fred Megson.
30	South London	Excursion: Zoological Gardens. Leader, Mr. Boxall.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 14,—Mr. W. D. Welford in the chair.

Mr. H. B. SHARP (of Sharp & Hitchmough, of Liverpool), in exhibiting the firm's new projection lantern (see Photographic Club, below), remarked that it was constructed in a more portable form than the usual run of lanterns. The lantern is packed in a box, and is of camera-body form. When placed on top of the box for use, the tail and front boards let down, and are made rigid. It is intended for use with Lawson's saturator, which is held by a tray in the base of the lantern. The lantern is also adjustable, to give a long extension, and is fitted with a stage for taking various sizes of carriers, together with a mask or diaphragm, enabling a disc to be obtained on the screen, clear and horizontal, without putting in a slide. Rising and side motions are given to the lantern, the box containing receptacles for tools, &c. The "box," said Mr. Sharp, is similar to that "invented" by Mr. Askew, but boxes on the same principle were made fifteen years ago, and they (Messrs. Sharp & Hitchmough) had made such a box before Mr. Askew had patented his. The weight of the lantern is eleven pounds, and it can be adapted for use with an oil lantern or a limelight jet.

Mr. Sharp was thanked by the meeting for showing the lantern.

The Chairman showed a panoramic view. The ends of the pictures, when joined made a complete circle of the view.

After other business, the nomination of officers for the ensuing year was proceeded with.

The meeting then became a special one.

PHOTOGRAPHIC CLUB.

JUNE 13,—Mr. Alexander Cowan in the chair.

Mr. H. Wilmer showed a proof from the plate etched by himself at the previous meeting. It was much admired, and was considered superior to the one etched before the Photographic Society of Great Britain.

The HON. SECRETARY said it would be considered at the next committee meeting whether this picture should form the frontispiece to the next annual report.

Mr. Bulbeck also showed two copper plates of small size etched by himself, and proofs from same. These were very excellent little pictures, and were much admired.

A NEW LANTERN.

Mr. H. B. Sharp (Sharp & Hitchmough, Liverpool) showed a portable lantern which was entirely self-contained. The one shown was specially adapted for use with a Lawson saturator. The focussing was done with rack and pinion on lens jacket, and short or long-focus lenses could be used and readily exchanged, as each was mounted in a cell that slipped into the jacket. To obviate the necessity of inserting a slide and projecting same on screen to ascertain when same was horizontal, a square mask was fitted in front of the condenser, and the edges of said mask could be focussed. One novelty specially pointed out was the adjustable carrier stage, which admitted of mounted and unmounted slides of irregular sizes being used. The lantern in use was fitted on top of the travelling case (which had adjustments for raising and lowering the apparatus, and a lateral motion), which was mounted on a tripod with gas bottle suspended underneath, the whole being very steady.

Mr. FRANK HAES having asked if the lantern would take American slides,

Mr. H. SNOWDEN WARD said the best of the American societies now stipulated for the three and a quarter slide. He explained that the reason they were made $3\frac{1}{4} \times 4$ was that titling could be written.

Mr SHARP said that the total weight of his lantern when boxed up was less than half of an ordinary lantern of the same length of focus.

Mr. Snowden Ward presented, on behalf of the Le Page Company, a sample bottle of fish glue, which was specially prepared for photo-mechanical purposes. It was very adhesive, a little of it went a long way, and it was perfectly neutral.

Mr. Sinclair showed Cadett's new exposure meter (Dibdin's patent), the price of which was 6*d.* only.

Mr. FOXLEE, referring to a lens shown by Mr. Halse two or three years since (a Steinheil antiplanat), said that there was now a new one by the same makers, much lighter in build, the posterior lens of which, instead of being one heavy glass, consisted of a crown between two flints. The advantages claimed were that it was more rapid and covered with larger aperture.

Croydon Camera Club.—The eleventh excursion of the season was held on June 13, when a party of eight members travelled down to Cambridge, the leader being Mr. W. Fenton Frost, who arranged for special cheap rail tickets. Arriving before eleven a.m., nine hours were spent in securing just on one hundred negatives, mainly of such scenes as Clare Bridge, Darwin's Corner, the Mathematical Bridge, &c., although the colleges and other buildings were not entirely neglected.

East London Photographic Society.—June 12, Mr. M. A. Wilkinson (President) in the chair.—Negatives were shown by Messrs. Aldridge, Bennett, and Marshall. A paper was read by Mr. G. C. BENNETT, entitled *Negatives or Pictures*, in which were remarked the pleasing changes which had been wrought in public exhibitions of late years, and condemning the meaningless habit of exposing plates simply because they are taken out, without giving due consideration beforehand as to whether the subject contained the necessaries to make up a picture. Also asking the question of all amateurs, "If asked for a few prints for exhibition, what proportion would be available?" the lecturer made bold to say not more than ten per cent. What, then, of the ninety per cent.? Were they simply exposed plates, or what were they? He drew attention to the great benefit to be derived from studying works of art of painters of repute. In conclusion, he commended the spirit of the paper to their serious thought, and trusted that, in the Society's forthcoming Exhibition their contributions would in some way show the teaching set forth in the discourse.

ON Saturday, the 16th, five members of the Society carried out the arranged outing to Whipps Cross and neighbouroood, and had a very pleasant and enjoyable afternoon. The Society has now made arrangements so that its members shall have a quarterly competition carried out under separate rules governing the same.

Hackney Photographic Society.—June 12, Dr. Gerard Smith in the chair.—Report of the excursion to Loughton on Derby Day was read by Mr. Dean. As Mr. Farmer announced that he would be unable to lead the Broxbourne excursion on the 23rd inst., it has been postponed until the 7th ult. Members' work was shown by Messrs. Farmer, Gosling, Hudson, Roofe, and Gerard Smith. The Hon. Secretary showed Mallandain's sepia and blue papers, and also Sprat's patent fastening for dark slides. Mr. R. BECKETT then dealt with the subject of halation. Speaking of the so-called cures—Brunswick black, sienna and water, backing papers, &c.—he said that these were only partial remedies. To be effective, the backing should be a perfect absorber of actinic light, and its refractive index should as nearly as possible coincide with that of glass. Of all the remedies put forward from time to time, none were so perfect in this respect as caramel. It was somewhat troublesome to prepare, but when used was a complete cure for halation. A mixture of caramel and sienna was

often recommended, but the sienna weakened the effectiveness of the caramel. The latter should be used in solution alone, or with a little spirit added, to facilitate drying. It should be applied with a rather stiff brush to the back of the plates, which should then be allowed to stand for a short time to dry, or, rather, set. To prevent any chance of the plates sticking in the dark slides, a piece of fine tissue paper should be laid over the backing and pressed down. The whole operation would not take long, for, by the time a dozen plates had been coated with caramel, the first might have the paper applied to it. It was not necessary to remove the backing before developing. The caramel would only have the effect of making the solution darker, and this would be an advantage in there being less chance of fogging the plate. Mr. Beckett backed some plates at the meeting, and showed how easy the operation was. He also showed some results of experiments he had made with backed and unbacked plates. As a severe test, 240 times normal exposure had been given. In the results, halation had entirely obliterated the outlines of the figures in the unbacked negatives, while, in those backed, halation was quite absent in those in which the caramel had been allowed to dry before exposing, and nearly so, but not quite, in some which had been exposed while the caramel was still wet. The experiments also demonstrated the fact that it was necessary to clean the back of the plate before applying the caramel, as in one case, where a spot of emulsion on the glass had prevented the backing coming in optical contact with the latter, halation was present. Mr. G. H. JUDD, on behalf of Mr. Dallmeyer, then showed and explained Burchett's colour screens. He said that yellow screens, unless made very deep in tint, and, consequently, increasing exposure enormously, did not cut off all the violet and ultra violet rays. Mr. Burchett had discovered that green in combination with yellow did this effectively without greatly increasing the exposure, and on this principle his screens were made. They consisted of two discs of optically worked glass, one being light amber in colour, and the other a peculiar shade of green. They were mounted separately in hoods, and placed in combination on the lens, preferably the green in front of the lens and the yellow behind. They required an increased exposure of six times with orthochromatic plates, and nine to ten times with ordinary plates. With their use halation was prevented. Besides these, Mr. Burchett had introduced lighter screens made of two pieces of optically worked glass, cemented together with balsam stained with a light tint of greenish yellow. These increased exposure about twice. Besides these, Mr. JUDD showed a lens in which the balsam used for cementing the combinations had been stained. This, he said, was very effective for portraiture, and did not increase the necessary exposure. He then showed work done with the aid of the various screens. In the discussion which followed, Mr. AVENT questioned whether the same effect would not be obtained with an orange-coloured screen as with the yellow and green combination; also, referring to a statement made at a former meeting that, with ordinary plates, a yellow screen was of no use, he did not agree with it, and believed that a better colour rendering could be obtained with an ordinary plate and a deep orange screen than with the same plate without one. Mr. BECKETT concurred, and said that, as dry plates of the ordinary kind were sensitive to all rays of the spectrum, it was only a question of degree, and, if the blue and violet were cut off, the other rays would act if only allowed sufficient time.

Fairfield Camera Club.—Monthly Meeting, Mr. H. Holt (Vice-President) in the chair.—Mr. W. TYLAR, of Aston, Birmingham, the well-known manufacturer of photographic sundries, gave an interesting demonstration on the *Hill Norris Dry-collodion Plates.* By means of comparative lantern slides he showed the enormous advantages of dry collodion over gelatine for a variety of subjects, especially those requiring enlarging. The freedom from granularity in the former was quite a surprise to the members.

Liverpool Amateur Photographic Association.—On Saturday morning, the 9th inst., a number of members and friends proceeded to Manchester, and, under the guidance of Mr. J. Davenport, took train to Peel Causeway, thence by waggonette to the charming village of Rostherne. Some good pictures were obtained, particularly of the "Mere," a fine sheet of water affording every chance for artistic effects. A portion of the route—the walk down the Bollin Valley—had to be abandoned in consequence of the rain. Among the visitors was Captain C. A. Davis, an ardent photographer, whose ship, the *Governor Ames,* the only five-masted schooner afloat, is now discharging a large cargo of timber at the Canada Dock.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,305.—"Photographic Camera." W. J. GREATOREX.—*Dated June,* 1894.

No. 11,331.—"Improvements in Means for Mounting Photographs." J. G. ARMSTRONG.—*Dated June,* 1894.

No. 11,387.—"New or Improved Method and Means of Exposing and Changing Flexible Sensitive Surfaces used as a Pack in Photographic Cameras." H. H. and A. L. ADAMS.—*Dated June,* 1894.

No. 11,391.—"The Equalisation and Part Exposure Photographic Shutter for Instantaneous or Slow Work." Complete specification. H. T. DE LA CROUEÉ.—*Dated June,* 1894.

No. 11,529.—"Illuminating Dissolving Reflecting Screens and Accessories for Photography." J. J. BUTCHER.—*Dated June,* 1894.

No. 11,563.—"Developing and Changing Tent." F. AMSDEN.—*Dated June,* 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 11,789. ALFRED WILLMER POCOCK, 66, St. Ann's-hill, Wandsworth, Surrey.—*May* 12, 1894.

MY invention relates to photographic cameras, and consists of improvements in the detail of construction as hereinafter described, whereby they are rendered very compact and portable, and have no inconvenient projecting parts when closed and out of use, and whereby they are very easy to manipulate.

According to my invention, I connect the front and back boards or ends of the camera together by arms or frames pivoted to the front and back boards or ends respectively, and hinged together at their outer ends, so as to admit of the camera being readily opened out or expanded for use and closed or contracted.

Springs are arranged to act on the frames or arms so as to maintain the camera firm and rigid when in its expanded and contracted positions. Adjusting screws are also provided, by which the extent of expansion of the camera may be governed, these screws also serving to adjust the focus of the camera. The lens is mounted in a ring fitted to slide in a tube capable of being rotated in another tube fixed to the front board of the camera. The ring in which the lens is mounted has pins or projections which enter helical slots in the rotating tube, one or more of the said pins or projections passing through one or more of the said helical slots into a longitudinal slot or longitudinal slots in the fixed outer tube. The plate by which the stationary outer tube is fixed to the front board is provided with segmental slots, through which pass screws into a rim or flange formed on the rotating tube so as to connect the tubes together, but admit of the inner tube being rotated, which may be effected by means of a projection formed on the flange of the said inner tube. By turning the inner tube in the outer tube, the helical slots, by acting on the pins or projections on the ring in which the lens is mounted, will cause the said lens to move longitudinally in the said tube, and thereby the lens may be readily focussed. The lens and the focussing arrangement described are contained behind the front board of the camera. On the interior surface of the front board I arrange an improved shutter, which consists of two pivoted plates, arranged to slide one over the other opposite the sight hole or lens opening in the front board, these plates being provided with openings and an operating device so arranged that the exposure commences at the centre or axis of the lens, and closes from the periphery to the centre. The plates are connected together by crank arms and a connecting rod so as to move simultaneously, and one of the said plates is provided with an additional arm having a segmental piece with notches or projections or both, with one or other of which spring detents are caused to engage to retain the plates in the open or exposing position, and also in the closed position.

To this additional arm is pivoted an arm or lever, by means of which the shutter is set for operation, the end of which arm projects through a slot to outside the front board, this slot being provided at the opposite ends with notches, in either of which the said lever may be caused to engage. The arm to which this lever is pivoted carries springs which have a bearing on opposite edges of the lever, so that, when the lever is moved to one side or the other, and engaged in one of the notches in the ends of the slot, the corresponding spring is pressed out of its normal position, and tends to move the plates to their exposing position, but is prevented from doing so by the spring detents engaging the projections or notches on the segmental end of the arm. The arm may be released from the detents by depressing one or other of the said detents from outside the camera.

By pressing one of these detents, namely, that which is provided with an additional projection, the shutter will, under the action of the spring, be caused to open and close instantly; but, if it be desired to prolong the exposure, the detent not provided with the additional projection is first depressed, whereupon the shutter will open; but, as the other detent has not been depressed, the projection thereon will remain in the tract of a projection on the arm, and will thereby prevent the shutters from closing. To close the shutter the detent with the additional projection thereon must be depressed so as to remove the projection out of engagement with the projection on the arm, whereupon, under the action of the spring, the shutter will immediately close.

The sensitised plates or films to receive the pictures are arranged one on top of another in a case or chamber constituting a hollow dark slide, which is slid and fixed in the back board or end of the camera.

This dark slide consists of two cases fitted to slide one within the other. The outer case is closed on its four sides and at one end, whilst the inner case is closed at one end and only three of its sides, the other side being open, to expose the front plate of the set contained therein.

When the dark slide is inserted in the back board or end of the camera, the inner case is secured therein by a sliding bolt, so that the outer case can be withdrawn without the said inner case. To the exterior of one side or edge of the inner case is secured a blade spring, having a projection thereon which passes through an opening in the said side, and engages all the sensitised plates contained in the case except that lying next to the open side of the case.

Inside the case is a thin plate having at its inner end a projection to engage the edge of the front one of the sensitised plates, and at its opposite end

another projection which engages all the plates contained in the case. This thin plate is connected to a rod or bar situated outside the case by a pin which passes through a slot in the case, by means of which bar the thin internal plate may be drawn outward, and with it the front sensitised plate with which the projection thereon engages. The sensitised plates are pressed towards the open side of this inner case by springs, so that, when the front plate is withdrawn as described, the rest of the plates are pressed forward; a space being thus provided at the back of the other plates for the plate which had been withdrawn.

Before a plate can be withdrawn the outer case must first be drawn out sufficiently to expose the front sensitised plate, which outer case then forms a receptacle for the plate which is withdrawn, which plate assumes such a position in the outer case that, when the rod or bar connected to the inner slide is pressed inward, the projection thereon, which engages all the plates, will force the withdrawn plate into the space provided at the back of the other plates in the inner case.

Springs may be arranged in the inner case or in the sliding case, to pass the plate which is withdrawn by the pusher into the proper position for being pushed behind the other plates.

When all the plates contained in the case have been used, the case may be unbolted and removed from the camera, and replaced by another case containing a supply of unused plates.

A hook or bolt may be provided for the purpose of locking the outer case of the dark slide to the inner case, and situated or arranged so that, by the act of securing the inner case to the back board of the camera by the bolt provided for that purpose, the said bolt is caused to act on the hook or bolt so as to unlock the outer case, to admit of it being withdrawn to expose the front sensitised plate, and, by moving the bolt, to detach the dark slide from the back board of the camera, the said bolt will cause the hook or bolt to be moved so as to connect the outer case to the inner case of the dark slide, which can then be removed from the camera without danger of opening it accidentally during removal.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SILVER IN DRY PLATES.

To the EDITOR.

SIR,—I think Mr. H. S. Starnes has somewhat misunderstood my letter. What I meant to convey was, that those plates, weak in silver, gave good density apart from the developer employed. I further strengthened this by noting that ferrous oxalate gave as good relative density as the others. I am fully aware of the action of organic developers in increasing the density of the deposited silver by the addition of "extractive" colouring matter, but I still hold that this plays a secondary part in the question, since it is present in both "rich" and "poor" plates. One proves this readily by extracting the colouring and comparing the deposits in both cases.

If my memory fails not, I have performed the little experiment advised by Mr. Starnes, and may even have tried all the organic developers in the same way, besides trying to estimate the colouring thus carried down, and the amount of silver reduced in a given time by each developer. I was compelled, however, to come to the above conclusion; and, I repeat, it is comforting to know that the image from such "poor" films is not mainly a mixture of the "extractive" from the developer with a small proportion of silver, but is an image which, as regards clearing baths and fading in sunlight, will keep its density with the best. Mr. Starnes supports this view when he instances the behaviour of similar plates with a well-restrained and an unrestrained developer; for the "colouring" matter being present in the developer in both cases one would expect similar results irrespective of bromide. I did not mean to imply that the various gelatines acted as developers. What I wished to convey was that certain samples under like conditions gave very much greater density than others. And I will go a step further to assert that it is quite possible to prepare your gelatine for giving the best results with the least silver.

I quite agree with Mr. Starnes that a combination of the silver with the gelatine produces this density. But can he explain how I get similar results without the silver nitrate coming in contact for any length of time with the gelatine? Thus, in emulsion-making, when the gelatine and bromide are digested together and a solution of nitrate in water added.

At present I am inclined to think that a double compound may be formed, by the silver bromide and one of the constituents of the gelatine; that the formation of this compound is connected with the phenomena of solution; and that Messrs. Cross and Bevan are on the right track in attributing certain aspects of this subject to a solution of the silver haloid in the gelatine.

It is also very instructing to note the behaviour of the different salts of silver in giving density. The whole subject is very interesting, and will afford a rich harvest to the careful investigator.—I am, yours, &c.,

June 16, 1894. J. B. FINDLAY.

THE "GRAPHIC."

To the EDITOR.

SIR,—"Cosmos" is somewhat unjust in "assuming the *Graphic* has not been in the habit of paying their artists." I know many who have received high prices for their sketches, and, speaking as a photographer, I have always found the *Graphic* very much the reverse of mean—quite the contrary. As a professional, I offer no opionion respecting the circular addressed to amateur photographers, but should rather fancy the editor of an illustrated paper, depending on a regular flow of amateur talent, would at times find his pages somewhat difficult to fill.—I am, yours, &c.,

9, *Pembroke-square, Kensington, W., June* 18, 1894.

FRED HOLLYER.

To the EDITOR.

SIR,—Surely there must be an error or an omission in the circular your correspondent "Cosmos" writes last week respecting the *Graphic*. I have not seen the circular mentioned, but my personal experience with them for over twenty years and up to date is totally at variance with the same. They have never used a photograph of mine which has not been paid for on my usual terms, and, for specialities, I may say, very handsomely, with acknowledgment of authorship, and have never made any suggestion to the contrary, and I do not think for one moment they wish to get any photograph for publication for nothing. Many other illustrated papers I could mention row in the same boat. I am quite aware that many *so-called artists* will purchase a photograph, copy this, and send it in as an original *etching*, when they have never set eyes on the place. There is a reproduction from a photograph of mine in the *Illustrated London News* of September 26, 1857, of the planting of the Russian guns in Victoria Park, Bath, and I well recollect a conversation with the late Mr. Ingram, saying the time would come when the public would not be satisfied with the imagination of the artist, but would prefer the reality of the camera, and that the illustrated papers would not do without them. Has that time come? I think it has; without photography they could not exist, and photographers should be paid for copies of their works with acknowledgment. Respectable papers do this, from my experience, and the *Graphic* is certainly an A 1 example. HORATIO NELSON KING.

4, *Avenue-road, Goldhawk-road, London, W.*

VELOX *VERSUS* PYRO.

To the EDITOR.

SIR,—Kindly afford me the opportunity to correct a statement attributed to me in your report last week of the London and Provincial Society's discussion upon "Velox." As we are always likely to be tackled later on upon any definite assertion made, I should like to put this right exactly. Your report gives the idea that I said "velox" was better than pyro, but this is not true. My statement was to the effect that I usually tried new developers as regards their capabilities or advantages for snap-shot development against washing soda and dry pyro, the plate receiving a preliminary immersion in the former. "Velox" I found produced negatives quite equal to those resulting from the use of my standard developer. What you mean by "He had tried it against washing soda and pyro, and found it better than the *latter*" (my italics), I don't know, except it refers to pyro. The results with "velox" are equal to those with pyro (plus washing soda), but I have never stated that they are better, though the quicker development and easier printing negative are advantages in another direction. "Velox," however, is certainly better than washing soda by itself. WALTER D. WELFORD.

"*Photographic Review of Reviews*" *Office, London, June* 18.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted photographic apparatus in exchange for a large model steam crane.—Address, J. B., 22, Bedford-terrace, Moray-road, Holloway, N.

Underwood's half-plate "Instanto" set in case, new, also fine guitar, for cabinet portrait lens or whole-plate Euryscope by good maker.—Address, H. ALEXANDER, 6, Milton-road, West Hartlepool.

Will exchange nine Gem lens, quarter-plate, cold roller, set of carving tools, and auto harp, for a light whole-plate camera, square bellows, and backs.—Address, A. L. SMITH, 233, Uxbridge-road, W.

Will exchange Samuel's hand camera, rapid rectilinear lens, bag changing, carries twelve plates $2\frac{3}{4} \times 3\frac{1}{4}$, box of oil paints and box of water colours, for Lancaster's Instantograph quarter-plate, or any other good make, or will exchange for Gem apparatus.—Address, JOSEPH F. TEAGUE, 44, Leighton-lane, Leeds.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

PHOTOGRAPHS REGISTERED :—

William Griffith Honey, Cork.—*Photograph of O'Donovan Rossa.*

Thomas Boxell, Scarborough.—*Photograph of a drawing of "A Storm off Scarborough."*

Joseph Brandebourg, Chester.—*Photograph of the Delegates of the Primitive Methodist Connexion.*

RECEIVED.—The Sixty-first Annual Report of the Royal Cornwall Polytechnic Society; Pioneer; and others.

VOGT, HERBST, & CO.—Received; in our next.

W. G. ORME.—The "Lucerna" can be strongly recommended.

F. W. P. (U.S.A.).—The address is, Colonel J. Waterhouse, Calcutta.

ARTHUR VIVIAN.—We fear we can do nothing further to assist you in recovering the negative. Why not try the effect of legal proceedings?

R. A. C.—If you consult the advertisement columns, you will see there the tissue is already on the market. Write to the manufacturers.

VIGNETTER.—To vignette a portrait into a black surrounding, protect the figure by an opaque oval or other shaped mask attached to a glass plate, and then expose to the light until the ground is black.

HUGH HOMFRAY.—The combined toning and fixing bath made by the formula enclosed cannot be expected to yield such permanent prints as the sulphocyanide one recommended for the Ilford P.O.P.

S. O. BRIAN and S. B.—You will find an article on the subject of your complaint in another column. Of course, as you will see, we cannot offer any opinion as to the fairness or otherwise of the returns.

T. REDWELL.—We can give you no help beyond telling you that the plates must have been exposed to light. If the plates blacken all over and show no image directly the developer is applied, there is no remedy.

W. A. WHISTON says: "Can any reader give me such instructions as will enable me to produce letterpress blocks by photography, similar to those by the Meisenbach Company? Is there any book on the subject?"—See the ALMANAC for 1893.

KENT.—Impossible from a casual look of the print to say the cause of the fading. If the mounts are suspected of being the cause, why not test them and be sure? You can satisfy yourself on the point by following the directions given on page 542 of the ALMANAC for 1893.

E. GOODFELLOW.—Much will depend upon your regular charges. If they are moderate, then we should say that half a guinea would be a fair price for the negative under the circumstances. If the business is a high-class one, the price should be more; if a cheap one, it may be less.

H. R. P. (France).—If neither of the washers named give satisfaction, we fear we cannot assist, as they are amongst the best, and are generally approved of. We should advise a trial of washing in ordinary dishes, as the number of prints is very small, leaving the water running into them, and taking the prints out and draining them at frequent intervals. There is no more effectual way of washing prints than this.

C. C. (Leeds).—We know nothing of the paste in question, but we should hesitate to use any mountant the composition of which we did not know, for any silver prints we valued, unless we had some guarantee beyond that of the retail seller that it would be inert in the pictures. As a rule, commercial adhesive cements are not to be relied upon when the permanence of the photographs mounted with them is of importance.

AMATEUR.—All will depend upon the character of the plates as to which will give the best results. The developer that may be the best for one brand of plate is not necessarily the best for another. The rules follow to some extent, but, as different developing agents behave differently with varying makes of plates, no definite rule can be laid down that would be of any real value. Try a few tentative experiments with the developing agents named on different makes of standard plates. The result will prove of value to you for future guidance.

MAC.—There is no fixed rule as to the value of the goodwill of a business, as so much depends upon conditions. In small businesses the goodwill is often worth nothing from a business point of view. The plant at valuation would then be a fair price. In a business with large returns, if the prices are low and the expenses high, it might not be worth much, while, with a smaller business and smaller returns at high prices and moderate expenses, it might be worth much more. As we have said, much must depend upon circumstances. It is not the returns, but the net profit upon them, that is the chief consideration.

TANGENT says: "I am anxious to invest in a cheap hand camera, not more than 20*s.* or 25*s.*, and shall be very much obliged if you would kindly give me advice as to which is the best. In the mean time I don't wish to get an expensive camera, and then I'd rather get an ordinary stand camera than pay a stiff price for a hand camera."—In reply, we do not undertake to advise our friends which is the "best" apparatus. If "Tangent" will procure a copy of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, and look through its innumerable advertisements, we do not doubt that he will find therein described a hand camera fulfilling his requirements.

J. E. G.—1. Crayons and chalks of the nature wanted are common articles of commerce. 2. With a very long exposure this is an ordinary indication.

F. E. G.—We advise you to get a lens one size larger than your present one. None of the cemented "rapid" lenses will cover sharply and flatly to the margin the size of plates advertised to do unless when stopped down, hence the advisability of employing one of larger dimensions and longer focus.

CHARLES HOARE.—You have taken considerable trouble to draw plans of the studio and adjoining building, but give no indication of their aspect. We, however, assume that the studio runs more or less north and south. If that is so, the east and west sides had better be glazed and fitted with blinds. Then the one side can be used in the morning, and the other in the afternoon. At times it may be an advantage to place the background at one end, and at times the other. With regard to lens, as the space is confined, it will be best to have two or more of different foci, and to always use the longest that circumstances will permit of, otherwise the perspective will appear strained.

L. M. asks: "Does a telescope answer satisfactorily as a means of focussing a camera where it is necessary to focus for various distances at short notice, such as is the case with marine views, or does not the telescope carry too much depth of focus to be critically reliable? What class of telescope should be used?"—In reply: In contrast with a photographic lens a telescope has no depth of focus to speak of, and hence its great value as a critically reliable means of obtaining the acme of sharpness in a photograph. The most convenient class of telescope for the purpose is the small pocket kind with two or three draws usually carried by tourists. They are quite inexpensive.

W. E. W. asks: "1. Can you tell me how to make a medium that will render photographs transparent that are mounted on glass with gelatine, as I want to paint them similar to crystolines? I have tried a mixture of castor oil, Canada balsam, and turpentine, but after a few days they are covered with opaque spots. 2. Can you tell me where I can obtain plates for a small hand camera?"—In reply: 1. Gelatine is more or less impervious to the usual materials used for rendering prints transparent. Possibly, however, a second or third application of the castor oil and balsam mixture, with a few days' interval between each, will answer. 2. Any of the makers would supply them to order. Failing that, the best way will be to purchase some of the stock size and cut them down, selecting, of course, those that will cut to the best advantage.

S. J. C. writes: "1. Having some of my negatives stained with silver, through printing without varnishing, I purchased a bottle of King's solution for removing stains, but found it only removed the metallic appearance, and left brownish spots on the film. Will you kindly advise me what to use to take away those spots? 2. I have also some peculiar brown spots on some of my negatives, before printing, caused, I believe, through making the hypo bath in a dish with iron rust in it. Can you kindly tell me how to remove them?"—1. Probably the solution was not allowed to act long enough. Try a longer time. 2. We have had no experience of spots of this nature, and cannot suggest a method for their removal. The spots, however, may not be really due to the cause suggested, and this is another reason why a suggestion cannot be made.

HADJA says: "I have an argentometer as used for testing strength of silver bath. I don't quite understand the scale. Do the figures show how many grains to an ounce of solution, or is there any calculation required? Also, does the precipitate of carbonate of soda (when clearing an old silver bath) take up any silver? and would it be detrimental to bath if the bicarbonate were used? Information as to the above would greatly oblige."—The so-called "argentometer" is supposed to register the grains per ounce of nitrate of silver in the solution. It does this rightly if it is well constructed and the solution contains nothing but nitrate of silver. Carbonate of soda, when added to the bath, precipitates some of the silver as carbonate of silver; hence it becomes weaker in proportion to the quantity added. See leading article on another page.

R. J. FORD says: "I should be glad if you can give me any idea of what causes the fog line through the centre of the plate? This is one plate of six. The rest are all right but one, and that shows a slight indication, but not so pronounced as the accompanying print. The camera is perfectly light-tight, and the slides are the same. The shutter is a new one, and perfect. Do you think it comes from the lens stop—I mean where the diaphragm goes in? That is the only solution I can give to it. There was no sun shining at the time. If you can help me I shall be thankful. It occurred last summer, and I want to avoid it this."—The fog is due to the action of light in some way or other, but certainly not through the slot of the lens. We should rather suspect the shutter or the slides, the former rather than the latter, as the most intense part of the fog is at the bottom of the plate, and there is a sharp line of demarcation down the centre of the plate, one side being quite free from the evil.

*** Several answers to correspondents unavoidably held over.

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PANORAMAS.

In a previous article we confined our attention to the depicting of wide-angle views of nature—that is to say, wide angles as usually understood, and not as partaking of the nature of panoramic projection. To the former there is necessarily a limit, but to the latter there is none, for by it the whole circle of 360° may be included with perfect accuracy and without difficulty.

But the majority of artists do not aspire to anything beyond what we may designate a limited panoramic projection—that is to say, one-third of the circle, or 120° on the base line of the picture, for an angle of this width is found to be quite sufficient to depict such objects as chains of lakes, ranges of mountains, or other subjects having a like relation to angular measurements.

In our previous article we have alluded to a successful method of taking a wide-angle view on a film by a lens working with what might be esteemed a moderately large aperture, this having been effected by imparting a slight curvature to the film. We now purpose to indicate by what means the idea may be carried much farther, taking in the coveted third of the circle, a thing that no lens yet made is capable of doing in plane perspective.

We have referred to two panoramic cameras as being perfect in their way, but which to the average photographer are comparatively prohibitive, the one from its not now being manufactured, the other from its costliness.

We have tried, and very successfully so, the imparting of a panoramic degree of curvature to a flexible film by means analogous to what we already described, and have no hesitation in saying that, if the subject were thoughtfully taken up by some of our energetic camera-makers, one could be placed on the market that, in respect of price and real efficiency, would meet the desires and requirements of many. By a panoramic degree of curvature of a film we mean one in which the curve will form a portion of a circle of which the focus of the lens shall be the centre.

To go into details, the nature of the lens that is to be employed is not very material, a single achromatic giving results equalling those obtainable by one strictly rectilinear; nor does it matter whether it covers a large field or even covers a small field either flatly or otherwise. But what is of importance is that the focus of the lens be accurately known. To this end we would not advise trusting to the optician's measurement of the focus as engraved on the mount, as the very last lens submitted to us for examination, and bearing the name of a maker of high eminence too, was inaccurate in this to the extent of being one and a half inches wrong in a professed focus of ten inches. This, at any rate, was the strict proportion to which it was out.

When the lens has been screwed to the front board, which must not be attached to the sides of the camera, this board must be made capable of being rotated so as to direct the axis of the lens from one end of the plate to the other, and the axis of rotation must be precisely underneath and above the focal centre of the lens, which, when thus mounted, possesses the peculiarity of giving an immovable image when rotated from side to side. This will not be the case if the centre of rotation be anywhere other than as we have indicated. This completes all the fitting up and attaching of the lens, if we except this, that affixed to the board which carries the lens, and projecting into the camera, must be a vertical chamber made of thin wood, stiff card, or even tin, about one inch or less in width, its height equalling the width of the sensitive film. The object of this is to prevent any light from the lens to be admitted to the plate except that which passes through the narrow slot at the back of the chamber, which, as the lens is moved, describes a circle as close to the curved plate as conveniently can be done. The inside should be blackened with dead varnish, and the end should be closed up with an opaque piece, having in it a vertical slot much narrower than the chamber, this also being coated with dead black varnish.

It is a little difficult to advise as to the width this diaphragm slot should be, but one that we have often used with excellent effect has an average width of a quarter of an inch. We say an *average* width, because the lower portion, which corresponds with the sky, is very much narrower than the upper part, through which the foreground is impressed. In this way we get delicate natural clouds with the same rapidity of movement as that by which we obtain a fully exposed foreground. Borrowing another idea from the pantascopic camera, we have had the diaphragm slot formed of two light slabs, capable of being moved farther apart or brought nearer together, according to the light or the rapidity with which the picture is desired to be impressed.

The dark slide for holding the film must have a curved face, against which the film must be pressed during exposure by means similar to what we described in a previous article. The curve must be struck from the focal centre of the lens; hence, when the extreme end of the plate is being exposed, it is so under identically the same conditions as the centre and every other portion of the film.

The exposure is made by moving a lever handle from one side of the camera to the other with a steady and rather rapid, sweeping movement. One end of the lever handle is fixed to

the rotating front board, which carries the lens; the hinder end is left free. It is almost needless to say that all light must be kept out of the camera by loose, flexible pieces of black velvet firmly attached both to the lens board and the camera, and so loose as to permit of the easy movement of the lens on its pivots. The manner in which the image is impressed is analogous to that by a focal plane shutter.

Hitherto we have assumed the sensitive film to be one of a reasonable degree of rigidity and thickness; but we think that a great advantage will arise from the adaptation of the roll-holder system. In the olden times of Sutton's panoramic camera, an ingenious application was made of it to sensitised paper bands by M. Camille Silvy. He carried the band behind a cylindrical glass, there being an unwinding and winding arrangement at either end. No matter how thin the sensitive paper was, it was always smooth and tight when exposed by the spherical lens—an optical instrument that has not been made for probably thirty-five or forty years.

The principle was so good that we have had it applied to the ordinary Eastman roll-holder and film, and after one or two trials have succeeded in bending a plate of colourless glass to the cylindrical curve required. We learn that such glasses can be bent to any desired curve by professional glass-benders at a trivial cost. On placing an Eastman film behind such a glass we have obtained an impression quite as sharp and brilliant, and with quite as brief an exposure, as if no glass had been interposed. That this should be so is evident, when we consider that the light passes through the glass directly and not obliquely.

BLISTERS AND OSMOSE.

In our remarks on this subject on the 15th inst. we gave particulars of a very remarkable experimental example of the rapidity with which water took the place of hypo in the dialytic apparatus, and in quantity far exceeding that of the displaced hypo. The point next to determine was whether this displacing power possessed any especial energy, and the mode in which we ascertained this was as follows:—In the bored indiarubber stopper of the dialyser was placed a tightly fitting glass tube a quarter of an inch in diameter, projecting downwards below the narrow end a quarter of an inch, and projecting upwards for nearly two feet. The apparatus was filled with fifteen per cent. hypo solution, the cork and tube inserted and kept securely *in situ* with strong twine. At this stage the hypo was one inch high in the tube. Difficulties arose here in getting the membrane perfectly tight, the head of liquid (about six inches) instantly finding the slightest aperture and causing leakage. We found very great difficulty in making a tight junction of membrane and glass, and had several failures before success, obtained by first placing a wide indiarubber band round the dialyser immediately below the rim, and fastening the paper with many tightly wrapped folds of thin twine. We give these particulars to enable any one repeating the experiment to do so without the time-absorbing failures we met with. It is to be noted, too, that great care must be taken in securing the cork into its place. All being ready, we suspended the apparatus, as before described, by a piece of cord fastened to a glass rod placed across the jar of water, the whole of the dialyser being submerged. At once a change was seen, the fluid began to rise in the tube. In two hours it was two and three-quarter inches high, two hours later the liquid was five and a quarter inches high, and in three hours more a height of nine inches was reached. Leaving the apparatus untouched till the next morning, the whole of the tube was full and running over. The experiment conclusively proved that the osmotic power was at the very least capable of exerting a pressure of close upon an ounce to the inch.

Previous experience having shown the great value of the addition of methylated spirit to the hypo solution in cases where blisters otherwise formed, we used the dialyser to gauge the effect, expecting to find a contrary action to that just described. We prepared two precisely similar arrangements as just described, placing the hypo solution in one, and in the other hypo of similar strength, but in which one-fifth of the water was replaced by the spirit. To our great surprise, the tube in the spirituous hypo rose, when examined in two hours' time, to twice the height it did with plain hypo, but when twelve hours had elapsed the levels were identical. We must confess our inability to explain this phenomenon, and it unfortunately showed that theoretical explanations indicated no mode of correcting the evil, and there was nothing left but to arrive at a cure by empirical experiment only. We tried the spirit addition to hypo, and found, in the majority of cases, that it arrested blistering, when without its use the prints would be covered. But it did not answer in all cases.

We tried the addition of ammonia, with a result that was inferior, on the whole, to spirit.

Ordinary salt was tried, both in the hypo and in the first washing water alone. Sometimes, in each instance, blistery paper came out unscathed, in others there was no advantage; and, although every care was taken in observing temperatures, and making the conditions of the experiments alike, we were utterly unable to state definitely that we had hit upon a cure. It will be understood that these experiments were continued over a series of months, for the successes of one day were nullified by the failures of another, under what we imagined to be identical conditions. We have still on hand a number of dialytic experiments, but, as they occupy considerable time in carrying out, we can do no more at this stage than barely refer to them.

The result, so far, would seem unsatisfactory enough; but we are able to place before our readers some results obtained by Mr. G. Watmough Webster which would really seem to have solved the difficulty. With us, he was a great advocate of the methylated-spirit process, but, with us, also found it not entirely to be relied on. But for many weeks past he has been able entirely to prevent blisters in a paper which otherwise he could not work with comfort by the following simple plan:—It is well known that the rapidity of osmotic action is the greater as the difference in strength of the solutions is greater. By using weak hypo, the tendency to exchange crystals for water would be less energetic than with strong hypo. But below a certain strength hypo should not be employed for fixing, lest the insoluble thiosulphate should be formed; but the same effect would be obtained by using hypo of ordinary strength, and, instead of placing the fixed prints in water, passing them through a weaker solution before they passed their first water bath. The respective strengths employed were eighteen per cent. and six per cent. So far, we are informed, complete success has attended the plan, and it is to be hoped that this simple method may be tried whenever any one experiences blister troubles, and we further express the hope that our readers who thus experiment may send an account of their results to us, so that it may be known whether or

not a cure has been found for a source of trouble as annoying as it is capricious, for many workers do not know what a blister means, while others find it an overwhelming and ever-present difficulty.

THE DEVELOPMENT OF POSITIVES ON OPAL.

As in negative-making, exposure and development go hand in hand, but in the case of opals it is perhaps more important that the exposure be correctly timed. Not that there is no "latitude" in development, for in one way there is quite as much as with a negative; but the gradation and general character of the positive image depend almost entirely upon the exposure.

In the case of a negative, wide variations in exposure produce corresponding variations in the density and gradation of the image, resulting in quicker or slower printing, without materially affecting, within certain limits, the final character of the picture; but, where the positive picture is concerned, there is no such capability of extensive variations of exposure, as the limits between which the gradations of the image will bear modification, without being short of detail on the one hand or heaviness on the other, are much narrower, and development can only be carried to a certain point and no farther. It follows, as a matter of course, that the exposure must be such as will sufficiently impress the lights of the picture, without producing too much effect on the shadows; in other words, as already stated, it must be accurately timed.

It is of the utmost importance that this fact should be recognised, for, if the attempt be made to rectify errors of exposure by modifications in development, the result will be, if not absolute failure, at least unsatisfactory; it is as well, therefore, to face the question squarely at the outset, and to give proper attention to the exposure. It is with the view of rendering this task easier that we counselled in our previous article the employment of a comparatively feeble light instead of daylight or gaslight, for it is manifestly easier to secure exactitude when the exposure is a protracted one than when a mere fraction of a second may divide success from failure.

The exposure may be said to give the character to the picture, so far at least as gradation is concerned, and development is practically helpless in the way of modification. But it must not be supposed that nothing can be done in development. On the contrary, so far as colour or tone is concerned, much, if not all, depends upon the character of the developer employed; the stronger and more vigorous the solution the richer the colour, and *vice versâ*. By the employment of a strong developer, well restrained, the image develops up quickly to the deep black colour preferred by many, while the more delicate grey tints are produced by slower development with a weaker solution.

But, whichever strength be employed, it must be in conjunction with a strictly accurate exposure, in order that detail and density are attained simultaneously, for, if such be not the case, the gradation of the image must suffer. If, from under-exposure, the development has to be forced in order to get out the finer details, then the shadows will become black and heavy, while, under reverse conditions, the detail will come up before the shadows have gained strength, and flatness will be the result.

So far as the actual developer is concerned, there is now a wide choice, although very many still adhere to ferrous oxalate, formerly the only one available. It is, perhaps, more from old association, rather than from any other cause, that the iron developer retains its position, for, while others of the newer developers give at least as good results, they are cleaner and easier in use. Ferrous oxalate, perhaps, has the advantage over hydroquinone, amidol, and metol, in so far that it is capable of giving a wider range of tones, from grey to black, according to the degree of dilution; but it also presents the disadvantage of a strong tendency to yellow stain, and necessitates the use of a clearing solution, which the others do not require.

It is not our intention to give any definite developing formula, as such would be impossible in view of the great variety of plates in the market, all requiring more or less different treatment; but, in our own practice, we find nothing answer better than *old* metol developer that has been used for negative purposes. This, if bottled and set aside, appears to retain its developing strength for opals for an almost indefinite period, and only requires dilution to produce almost as wide a range of tones as ferrous oxalate. It answers, too, equally well with both the slow and rapid plates of all the makes we have tried, and in that respect is superior to ferrous oxalate.

After development, it is necessary, in the case of opals, to exercise more than ordinary care to avoid staining—not the image, but the opal itself. The fixing bath as frequently employed for negatives in an almost black and muddy condition is utterly useless, as the colour is absorbed by the opal, and, unless discharged by some powerful clearing solution, which will probably affect the colour of the image, imparts a brown tinge to the otherwise pure whites of the picture. The bath should be perfectly clean, and preferably new, and should contain a certain proportion of free sulphurous acid, which assists in retaining the purity of the lights and removing any stain that may be present.

One great trouble with many operators consists in keeping the edges of the finished opal clean. Often, from careless manipulation, the effect of an opal picture is utterly spoilt by dirty margins; but, even with the greatest care, it is frequently impossible to avoid a dark line along the edge of the plate, where a thick ridge of emulsion has been. These markings may be removed from the *dry* plate by means of powdered pumice applied with a piece of rag or flannel, but, unless great care is taken, the surface of the picture will show an unevenly abraded appearance, that is not pleasing. A better plan consists in the use of a solution of chloride of copper, or some similar "bleaching" solution, followed by hypo, perhaps the best being tincture of iodine, which may be painted on with a piece of flannel, and the opal afterwards reimmersed in the fixing bath. This treatment leaves us often unevenness of surface.

The final washing of the opal should be accompanied by gentle friction with a soft rag or pad of flannel to remove any sediment that may have settled from the developing solution or the washing water.

The Value of Negatives.—The photographer who, a fortnight ago, recovered 40*l.* damages for a negative that was broken by a neighbour's fowl may congratulate himself on taking his case before a jury in a Superior Court, and not before some County Court Judges. In the County Court, before now, the value of negatives has been assessed at the value of the glass and the chemicals upon

it. Now we have a record as to the value of a negative to stand as a good precept. A noteworthy circumstance in this case, however, is that the defendants in the suit were not represented at the trial.

Heavy Damages for Slander.—It will be remembered that, a couple of years or so ago, a case of alleged fraud in connexion with the disposal of a photographic enamelling business was for several days before the magistrate at the Bow-street Police Court. Eventually the case was dismissed. The prosecutor, however, elected to be bound over to prosecute under the Vexatious Prosecutions Act, but the jury at the Old Bailey acquitted the then defendant. Since then, the latter has instituted proceedings against the former, who is described as a Belgian baron, for slander and malicious prosecution. The action was heard a few days back in the London Sheriffs' Court, and the jury awarded the plaintiff 1250*l.* as damages, and judgment was entered for that amount with costs. It is not often that such heavy damages are recovered in any case connected with photography.

"Opalines" by the Carbon Process.—In our issue of a fortnight back a correspondent directs attention to a method of producing carbon prints without a reversed negative, namely, by developing the print on glass, as transparencies are made, and then backing it up with paper or other material. It has always been a matter of surprise to us that the carbon process is not more extensively employed for the production of the so-called "opaline" pictures—that is, prints mounted in optical contact with glass. It would certainly be the simplest way of making them and, what is another advantage, permanent pictures would be secured. All that has to be done is to develop the exposed tissue, from an ordinary negative, on the glass, and then back it up with white paper. The glass might sometimes with advantage have a substratum of insoluble gelatine, as in the case of transparencies. Seeing that the majority of "porcelains"—pictures on opal glass—are by the carbon process, and for them reversed negatives are necessary, it is, as we have just said, surprising that the process is not also more used for the other class of picture.

Photographers' Copyright Union.—As we noted in our last issue, this useful body has been actively at work, and all photographers who are not already members should obtain the latest circular, which contains a deal of useful information and suggestions with regard to photographers and the illustrated press. The circulars issued are perfectly clear; yet, from letters we have received, some few seem to be under a little misconception as to the fees to be charged for the use of photographs. They have not, as some have surmised, been fixed at half a guinea or a guinea, but only as a minimum charge. Of course, in many instances, the illustrated papers would be glad to obtain the use of a copyright photograph at several times these amounts, and photographers would often be unwise to permit its use for less than its full value. Frequently a photographer goes to great expense to obtain a picture of a certain event that may never occur again, and it may happen that its publication in an illustrated journal would materially injure the sale of the photographs. All this should be taken into account when fixing the charge for the use of copyright photographs that are of more than passing interest.

Photographers' Charges.—We are frequently receiving letters from correspondents in the provinces asking what we should consider fair charges for taking photographs out of the ordinary course of business and away from the studio. In most instances it is mentioned that a demur is made to the price charged, which in every case has been exceedingly low as compared with that of the majority of London establishments. An insight as to the prices charged by some photographers is given in the amusing County Court case at Norwich reported last week. The plaintiff said the defendant wished him "to photograph his wife and her sister in the pony trap, together and separately." He agreed to take them up a certain road, and "to do the job for 12*s.* 6*d.*" It was mentioned in evidence that, on account of the restiveness of the pony, several plates had to be exposed, and, to please the lady, several proofs, with alterations, were submitted. The size of the pictures is not stated; but, as 2*s.* 6*d.* each was charged for copies, and the price not demurred to, we imagine they were not very small. It is to be sincerely hoped that the prices mentioned in this case are not in any way fairly representative of those charged generally in provincial places for this class of work.

THE USE OF A SINGLE LENS IN PORTRAITURE: A CRITICISM AND A REJOINDER.

In the May number of the *Studio*, a comparatively young but delightful artistic publication, there are some very good reproductions in half-tone of portrait studies by Mr. Ernst Lambert. I think I saw the originals of the pictures in the last Exhibition of the Photographic Society of Great Britain, and in my humble opinion they were neither better nor worse than many other portraits in the same saloon. Their special peculiarity is, that they were taken with single lenses, the advantages of which for large portrait work Mr. Lambert endeavours to set forth in a short article printed with the reproductions in the *Studio*. Upon some parts of the article I will with your permission make a few observations.

Mr. Lambert's predilection for portraiture with single lenses has, I think, betrayed him into some excesses of advocacy and ambiguities of statement which should not be allowed to have unchallenged utterance in a publication the readers of which are probably not in a position to discriminate between the truth and falsity of Mr. Lambert's doctrines. After some harmless platitudes over the difficulties of artistic portraiture, he proceeds to inform his readers that "it has been the custom of most photographers for years past to consider that the best lens is that which gives the sharpest image on the ground glass. This is a custom born of vulgarity and ignorance; experience shows that in portrait work the lens which gives the sharpest image is nearly always the worst for the purpose." In reply to this, I may remind Mr. Lambert that even his much-prized single lens, employed at its normal aperture, is capable of giving definition of the highest type of excellence. To charge photographers with "vulgarity and ignorance" because of their partiality for lenses possessing this very desirable quality of good defining power is, I submit, an unfortunate piece of thoughtlessness on his part. Mr. Lambert would do well to remember that sharpness in a photograph, portrait or landscape, is only vulgar in so far as it conflicts with the preferences of a very small number of persons, and that incompatibility of good definition with artistic effect is not by any means generally admitted or allowed. Again, does Mr. Lambert contend that with a lens which gives the sharpest image on the ground glass it is impossible or difficult to obtain the same degree of softness as with a single lens used at a large aperture?

After dilating upon the unsuitability of *carte-de-visite* or cabinet lenses (for obtaining "beautifully modelled and softly outlined pictures"), on account of their rapidity and shortness of "back focus" (*sic*), Mr. Lambert proceeds to recommend a single landscape lens working at a large aperture, and points out that the front combination of either a portrait or rectilinear lens will answer. His remarks upon the working properties of such objectives are right enough in the main, but I take leave to doubt his theory that the power of a single lens to give "softly outlined pictures" when opened out beyond its normal working aperture is unique, and not possessed by any other form of lens.

In my experience of single lenses, I have not been able to confirm the observations which Mr. Lambert has made with regard to their peculiar optical properties. Says he: "The great merit of a single lens in portrait work is its *depth of focus*; with the open aperture, or largest stop, it will be noticed that there is really no point in absolute focus; but, on the other hand, there is none of that disagreeable loss of structure in the parts most out of focus, so noticeable in pictures taken with other forms of lens. In short, this form of instrument seems to combine all the good qualities of other forms

and add some distinctive to itself. Its definition is distributed over a deeper field, its sharp rendering is not so sharp, and its 'out-of-focus' rendering less blurred than in that of any other form of lens." That is to say, according to Mr. Lambert (1), a noticeable property of a single lens with a large aperature is its depth of focus; but (2), with that stop, it does not focus at all. How, then, can it be said to have not only not "depth" of focus but an actual focus? What I suppose he means to say is that the lens does not give such obvious out-of-focus effects as other lenses; but is this, *pari passu*, correct? Mr. Lambert's optics, however, are a supreme enigma to me.

Mr. Lambert virtually recommends a single landscape lens, working at an aperture of *f*-6 for portrait work, and says that, with the diaphragms usually supplied, too much sharp definition for the purpose will be obtained. This is not of itself a necessity; it is all a matter of focal treatment. Opticians are lectured because they do not supply larger effective apertures to single lenses. The optician "speaks optically, and does not understand the artistic side of the question," says our authority. As lenses are made for the purpose of securing definition in photographs, it is to be hoped that the opticians will continue not to understand the artistic side of the question, but leave this to lens-users.

That "normal eyes do not see with the rigid sharpness of a photograph taken by one of the recognised forms of lenses" is a proposition which I fear Mr. Lambert could not easily sustain. Seeing, after all, is a mental operation, and I challenge him to deny that the brain at any rate is unconscious of sharpness in a view or portrait. Again, will he say why "sharpness and clear definition" are to be regarded as untrue? Is he prepared to hold that truth only resides in unsharpness and bad definition? His own pictures, soft and pleasing though they be, are neither unsharp nor ill-defined.

I do not under-value the practical uses of single lenses working at large apertures for portraiture, but some of the arguments and evidence with which Mr. Lambert supports his advocacy of them are so unreliable that I felt it desirable to subject them to examination and comment. I may, in conclusion, remind Mr. Lambert that, as your own writings testify, single lenses for portraiture have been recommended and employed these many years past; but I cannot call to mind that you have ever advocated them on such curiously unscientific grounds as it appears to me Mr. Lambert has done, or that in so doing definition and truth were so rashly placed in antagonism as in the case before us. I fear that Mr. Lambert, in attaching himself to the coat-tails of the so-called "New Movement" in modern photography, has merely contrived to appropriate some of its insincere and affected jargon, without quite appreciating its meaning or its significance. His final plea, that the optician "should not be allowed to encroach for a moment on the domain of artistic perception and feeling" is, for absolute and pathetic ludicrousness, only to be paralleled by a painter inveighing against the colourman on similar grounds.

R. E. Chesterman, D.Sc.

BINOCULAR VISION.

[Photo-Beacon.]

In one of the London photographic journals recently there were some curious remarks by a correspondent regarding the stereoscope and those who take pictures for it. He confessed that he never did anything that way himself, and intended to stick to single pictures, because he considered that the stereoscope gave a false idea of natural objects, and he called the makers of such pictures "faddists."

To those who, like myself, have never ceased to take an interest in the stereoscope during the last thirty years or more, such ideas seem somewhat erroneous, as I have all along believed that by no other means can we obtain such a faithful representation of objects at different distances from the eyes, and in no other way can we utilise, by pictorial representation, one of our most marvellous powers of vision, that of appreciating, within certain limits, the relative distances of objects. The fact of our being able, with few exceptions, to use our eyes in this way has made the power of doing it so familiar to us that we scarcely require to think of it; but it is really, in some respects, a wonderful special sense between seeing and feeling. Thus, by sight alone, as when only one eye is used, we can know the true forms of objects before us, but we have a very uncertain idea of their relative distances from us, and, by touching and feeling with our hands, we can ascertain the distances and other particulars of objects close at hand only. When, however, we use both eyes, we have, as it were, a power of almost feeling at a distance, for, besides seeing the orms of objects, we can tell at a glance which of them are near and which istant, and thus mentally place them in their true positions. It may not be too much to say, that if monocular vision, or seeing with one eye, had hitherto been the only rule, and binocular vision only now made available, it would be looked on as one of the marvellous discoveries of the age. The peculiar charm of the stereoscope arises from this power, and to appreciate it properly it is necessary to fully understand this special use of our eyes, many people never taking the trouble to think of it, and others having wrong ideas regarding it. Thus a very common belief is that two pictures, exactly alike, are all that is required for a stereoscopic slide, and that stereoscopic effect is simply a mysterious power belonging to the particular form or arrangement of the lenses. Such ideas could not exist along with a knowledge of the principles of binocular vision.

It is a common thing, in making surveys and certain scientific observations, to have to ascertain the distance of an inaccessible object, as, for instance, a rock in the sea at a considerable distance from the shore, and for this purpose the surveyor measures a base line on the shore, and from its extremities finds what angles are included between it and imaginary lines to the rock, from which by calculation, he can easily find the distance of the rock. If another rock nearer to the shore had to be measured from the same base line, the angles at the ends of the line would be less than in the first case, and, as a matter of course, the angles at the rocks formed by the imaginary lines to the ends of the base line would vary and be greatest for the nearest rock.

In a similar way the angle formed by the convergence of the axes of the eyes to meet at a certain object enables us, by using the distance between the centres of our eyes as a base line, to make a kind of mental trigonometrical calculation, with the result of our forming a fair idea of the distance of the object, and as our vision wanders from one object to another, at different distances from us, the axial angle must constantly vary, and we as constantly appreciate, if not measure, the different distance of the objects.

The eye, as every one knows, is very similar to the photographic camera, inasmuch as it is provided with a lens and a sensitive surface, called the retina, on which a representation of the objects before it is depicted. In the camera as used for landscape purposes every effort is made to have the image equally distinct all over the plate, but in the eye distinctness is confined to perhaps a single point in the axis or centre line, while over a considerable distance round that point we have more or less indistinct vision. At first sight this almost appears to be a defect, but is in reality a necessity for perfect binocular vision, for, when we look with both eyes at objects at different distances frcm us, the more distant ones appear, to the right eye, more toward the right hand, as compared with nearer ones, than they do to the left eye, in consequence of what may be called the point of view being more to the right, so that, if the two pictures formed on the retinas could be removed, they could not be superimposed without either the near or the distinct objects appearing doubled; consequently, when we direct the axes of our eyes to a near object, so as to see it distinctly, the more distant objects must be, and are, seen doubled, although indistinctly; and in the same way, when the eyes are directed to a distant object, the nearer ones appear doubled and indistinct. Now, if we had distinct vision over a considerable surface of the retina, instead of in a single point, we should of necessity see many of the doubled images distinctly, and there would be painful and inextricable confusion. At the same time, although distinct vision is limited to a single point, we can allow the eyes, or rather their axes, to wander over objects so quickly that, for all practical purposes, we may be said to see a large number of points, or a large surface, distinctly at one time, while in that wandering we may be continually altering the angle of the axes for different distances, and unconsciously making the calculations necessary for determining those distances.

Stereoscopic pictures are usually taken from two positions or points, about three inches apart, horizontally, so that they represent, in a tolerably but exact, slightly exaggerated, way, the two images seen by our eyes, and, like them, could not be exactly superimposed, and when the right eye is directed to the right-hand picture, and the left eye to the left-hand one, by means of a stereoscope or otherwise, the different objects represented appear under precisely the same conditions as when seen by both eyes; and, as in that case, if we look at what represents a near object, we see it distinctly, while the distant ones are doubled and indistinct, and *vice versâ*. By measurement, we find that

the distance between corresponding points in the two pictures is greater for distant objects than for near ones, so, as our eyes wander over the picture, we experience the same alteration in the angle of the axes as we do when looking at the real objects, and go through the same mental calculation, with precisely the same appreciation of position in regard to near and distant objects. In other words, the stereoscopic pictures give the actual appearance of solidity which their name implies, and therefore give us a more perfect representation of natural objects than can possibly be done by single pictures.

Although ordinary stereoscopic pictures cannot show relief or solidity at a considerable distance, any more than the eyes can, it is possible to show it by taking the pictures from points much wider apart than is usual, and thus objects which, on account of their distance, appear to be perfectly flat can be shown as clearly stereoscopic as if they were close at hand.

A curious and interesting effect is produced by altering the distance between a pair of stereoscopic pictures, as, for instance, by cutting a slide in two and directing an eye to each half, with or without a stereoscope. When the pictures are overlapped a little, or brought closer together than usual, the combined picture appears to be reduced in size, and when they are separated it appears larger, the reason being that in the former case the axes of the eye are more converged, and in the latter less so, giving the feeling that in one case the objects are nearer, and in the other that they are farther away. By transposing the two pictures and squinting, so that the right eye sees the left-hand picture, and *vice versâ*, the combined picture appears to be greatly reduced in size, on account of the great convergence of the axes of the eyes.

To lovers of the stereoscope it is very gratifying to think that it is again likely to occupy a prominent position in the photographic world, and, as it can be made very interesting, not only to those who use it scientifically, but to others who take it up as a mere pastime, there is every reason to hope that it has come to stay. GEORGE H. SLIGHT.

PHOTOGRAPHY IN COLOURS.

[Affiliation of Photographic Societies.]

THE subject of the two lectures which I have the honour to deliver to you is *Photography in Colours*, and, before entering upon the subject itself, I must make an explanatory statement with regard to colour.

When a ray of white light falls upon an object, it is, according to the nature of the substance, reflected either partially or wholly, or is partially or entirely absorbed. When the light is totally reflected we get white, when entirely absorbed we get black. We will now place in the path of the rays of light what is called a prism, that is, a particular-shaped piece of glass or bottle filled with liquid; we shall then get what is called a spectrum, and we have proved that white light is not simple, but compounded of light of all these colours. It is due to this fact, and to the peculiar nature of substances, that we get colour.

Natural coloured objects, such as flowers, or artificial coloured objects, such as coloured papers, passed along the spectrum, assume different colours in the various rays.

These experiments prove that substances possess the peculiar property of reflecting only certain of these coloured rays which form white light, and therefore these substances appear of the particuliar colour which they reflect.

If a spectrum of sun or solar light is formed, it will be found crossed by numerous dark lines, which are called Fraunhofer's lines, and no matter what size spectrum, how large or how small, we get these lines always in the same place, and they have been designated with certain letters, and it is customary to distinguish any particular colour of the

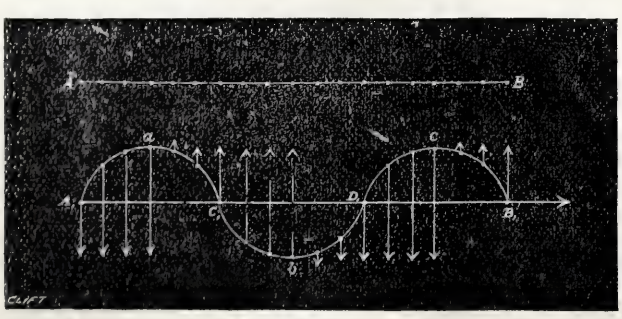


FIG. 1.

spectrum by referring to these lines. For instance, we talk of the yellow of the D line, or the greenish blue of the E $\frac{1}{2}$ F, that is, the particular shade of green which is found halfway between E and F.

I have made these explanations because we shall afterwards have to meet with certain statements which would be incomprehensible without this preliminary explanation.

Now, every particular ray or colour in this spectrum has what is called a particular wave length. I will explain what a wave length is. Here we have a ray of light which traverses the ether of that substance in which light is supposed to travel; these little dots represent particles of ether, and this shows how they vibrate. Now, A D is called a wave length, and the wave length is fixed for every particular line or part of the spectrum. I am going to tell you what the length of these waves are. They are so enormous that we have no appreciation of their size; for instance, for the red the wave length is 759,357 tenth metrets—a tenth metret is the ten-millionth of a millimetre, and a millimetre is $\frac{2937}{100000}$ of an inch—so that for the red the length of one of these waves is $\frac{1}{39300}$ of an inch, and for the violet about $\frac{1}{57800}$ of an inch. These figures are interesting doubtless, but the measurements they represent are so small that I might as well talk of eternity, for our finite minds cannot grasp them.

Every one who has seen the peculiarly fascinating little pictures, in all the brilliancy and vividness of colouring, which are represented upon the ground glass or focussing screen of a camera, must have felt a longing to fix the coloured image, and it is but natural to suppose that, in the early days of photography, similar feelings were felt by old experimenters, and thus we have the first commencement of the research on the subject of photography in natural colours; but this would be quite an erroneous supposition. Photography in natural colours was a subject of experiment long before any permanent image had been formed in a camera. Most writers ascribe to Seebeck (1810) the first experiment in this direction, but in 1782 Senebier published at Genoa a book entitled *Mémoires physico-chimiques sur l'influence de la lumière solaire pour modifier les êtres de trois règnes de la nature*, in which he states that, when chloride of silver, as it was then called "Horn silver," was exposed to the action of the solar spectrum, it assumed a violet colour, which had a distinct bluish tinge, which was brighter under the action of the less refrangible rays, that is, towards the red end of the spectrum. I am indebted for this note to Eder's valuable *Handbuch der Photographie*, vol. i. part 1, p. 37, in which he treats of the history of photo-chemistry, and Eder adds, "Thus the first statement was made that chloride of silver became differently coloured in the spectral colours, and Senebier appears therefore to be the forerunner of Seebeck's discovery that the spectrum is reproduced on chloride of silver in its natural colours."

In 1810 appeared Goethe's great work, *Geschichte der Farbenlehre*, or the history of colour, and in an appendix to this there is an important communication from Seebeck, of Jena, in which he describes an experiment of allowing the spectrum to fall on damp chloride of silver, and stated that he had noticed that, in the violet, the silver salt turned violet, in the blue it was blue, in the green was brighter, and in the yellow sometimes yellow, and, in the red, red.

Twenty-nine years later, in 1839, Sir John Herschel wrote to the *Athenæum*, under date August 28, and practically confirmed Seebeck's experiment. In the following year, February 20, 1840, a paper by Herschel was read before the Royal Society, in which he describes his experiments more fully, and gives the process of preparing the sensitive paper, and adds that "another highly important and practical conclusion which seems to be pointed to by this experiment is the possible future production of naturally coloured photographs."

Mr. Thomas Bolas has drawn my attention to a book published by Smith, Elder, & Co., in 1839, entitled *History and Practice of Photographic Drawing*, by L. J. M. Daguerre, translated by J. S. Semes, in which there is a description of Niépce's heliographic process, and the formation of colours is spoken off. (See Appendix.)

In 1840 Robert Hunt communicated to Sir John Herschel that he had found that chloride of silver gave coloured images under coloured glasses, and in his first edition, published in 1844, of *Researches on Light*, he states that fluoride of silver gave a distinct yellow line and a distinct green line in the spectrum under those particular spectrum rays.

In 1848, Edmond Becquerel published in the *Annales de Chimie et de Physique*, vol. xxii., 1848, that he tried in 1838 and 1839 to reproduce the colours. He tried precipitated chloride of silver, and later pure chloride, which had been exposed to daylight, and found that the solar spectrum was reproduced with an appreciable amount of colour, except in the yellow and green. Later on, he tried chloride of silver produced by the direct action of chlorine water on a silver plate, and found that the colours were actually produced. He then tried the formation of chloride by the use of certain salts, and used chloride of copper with good results, but, finding it impossible to thicken the film of silver chloride thus formed on the plate, formed the chloride of silver by the use of an electric battery. A Groves cell may be used, and, if a Daguerreotype plate be taken, and placed on a copper dipper, and connected with the positive pole of the battery, and placed in a glass vessel filled with hydrochloric acid 1·8, and the negative pole be immersed in the same liquid and kept moving about, the silver gradually becomes dulled by the formation of chloride. After some time the plate can be taken out, rinsed with distilled water, dried over a spirit lamp, and gently wiped with velvet; we shall find it of strong brown colour, and in this condition it gives good impressions of the spectrum. Becquerel afterwards

heated his plates at 30°–35°C. for some time, and for photographs in natural colours in the camera they had to be subjected to ten days' heating. He found out that certain rays of the spectrum also had the ame effect.

Practically, then, Becquerel was the first to obtain a photograph in natural colours in the camera. They were not perfect, and no means were found of fixing them. Certain precautions were necessary, such as cutting off the ultra violet and infra red rays.

In 1851, Niépce de St. Victor seems to have repeated Becquerel's experiments with various modifications, and his experiments were continued up to 1866, or possibly as late as 1870, the time of his death.

In 1865, Poitevin commenced working on Becquerel's earlier processes, and in 1866 he prepared paper with silver chloride, treated it with potassium bichromate and sulphate of copper, converted the chromate thus formed into subchloride or a violet-coloured reduction product by exposing it to daylight under solution of chloride of tin, and obtained good results.

Carl Bayer in 1868 published an improved though somewhat similar process, and in 1866 Wharton Simpson published in the *Photographic News* an account of his experiments, using collodio-chloride of silver.

In 1873, M. Saint Florent published in the *Bulletin de la Société Française*, vol. xx. p. 228, a process in which zinc chloride, uranium nitrate, mercuric nitrate, &c., was used.

Veress, of Klausenberg, within the recollection of many, if not all, was announced with a big flourish of trumpets to have succeeded in producing photographs in natural colours. He is stated to have worked on Poitevin's principle, and is, I believe, still working at it, though latterly he has been using an emulsion of Carey Lea's photochloride. In 1891, Kopp, a Swiss *savant*, took out a patent for a process which is rather complicated, but which may be briefly summed up as follows:—Chloride of silver was deposited on paper, exposed under a solution of chloride of zinc and sulphuric acid to daylight till it turned a bluish green, washed and dried. A mixture of bichromate of potash, sulphate of copper, and nitrate of mercury was made and the paper treated with it, then with chloride of zinc, washed and dried off with blotting-paper, and exposed whilst still damp. Valenta, a well-known chemist at Vienna, states that he has tried this with good results, and also that commercial collodio and gelatino-chloride papers will also give good results.

The theory of the formation of these colours is, according to Zenker, precisely the same as that involved in the following process; I shall not therefore trouble to explain it now, contenting myself by pointing out that there is no means of fixing these coloured images, that is, if they are exposed to light the whole film blackens, and the colours are lost, nor can they be fixed by hyposulphite of soda or any other chemical, because they are formed on silver subchloride Ag_2Cl, and the action of a fixing agent is to precipitate silver and dissolve the chloride.

In February, 1891, the whole world, I think I may say, was startled by the announcement that Dr. Gabriel Lippmann, a French physicist, had obtained photographs of the solar spectrum in its natural colours, which were fixed and absolutely permanent. I need not say that some wiseacres sneered and pooh-poohed it, others—and they were the general public as represented by some journalists—went into raptures over it, and prophesied that the day was not far off when every photograph would be taken in its natural colours, and that the artists of the brush and paint-pot were doomed, and others, again, immediately went to the professional photographer and wanted to be taken in natural colours. During the three years that have elapsed we have all calmed down; we recognise now what has been done—some dream of what may be and hope for the future; but, look at it what way we will, Lippmann was undoubtedly the first to obtain a photograph in natural colours which was practically absolutely permanent. Before showing you some of these results—and I am fortunate enough to be able to do so—I will have to explain how they are produced, and I must crave your indulgence. I am afraid I have had to tell you a lot of dry historical facts, and now we come to some dry explanations; but I want you all to understand what these photographs are, and how they are formed.

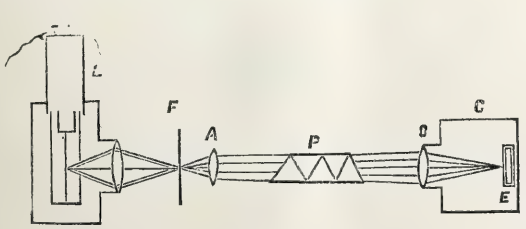


Fig. 2.

I will show you first of all the arrangement used by Lippmann to obtain his first results (fig. 2). L is an electric arc lamp with a condensing lens which condenses the light on to F, which is an opaque screen, in which is a very fine slit. The light passing through this slit is rendered parallel by the lens A, and, proceeding on, it passes through these five prisms, which decompose it, as we did in our first experiment, and O is the lens of a camera, which forms the image on E, which is a particular arrangement of the sensitive plate.

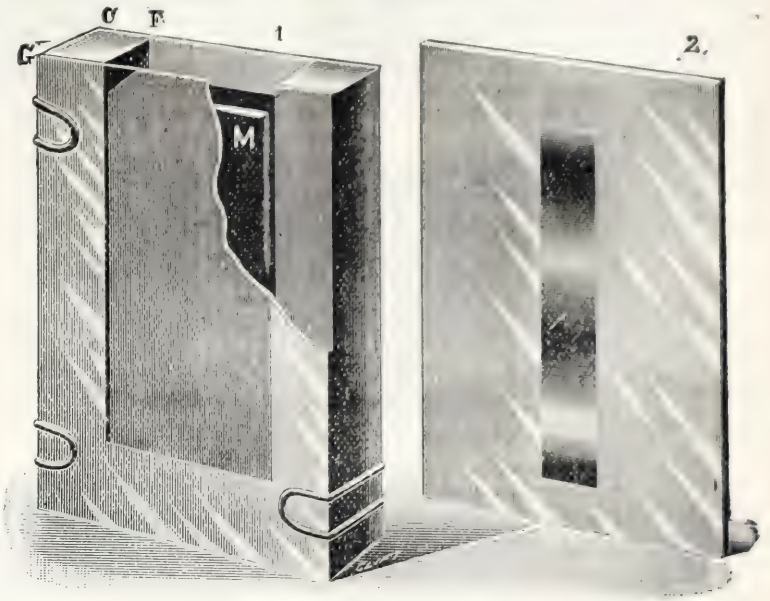


Fig. 3.

I will now show you a sketch of the arrangement of the sensitive plate (fig. 3). You see the sensitive plate in front here with the corner cut away; these two dark-side portions are pieces of square indiarubber which are fastened to a back plate of glass or wood. The sensitive plate is placed film inwards, and is clipped tightly down by means of these side clips, and then we have formed a little cell, which is filled with metallic mercury. I will explain why this is used directly.

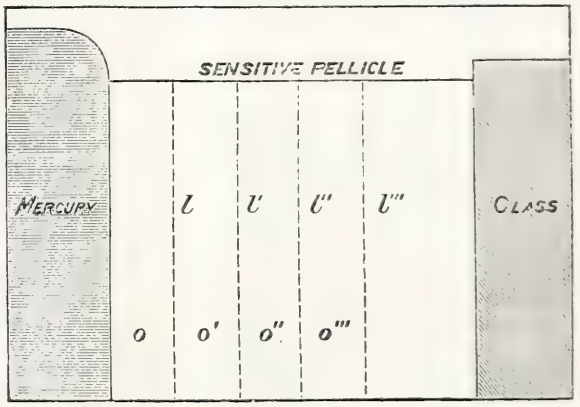


Fig. 4.

Here I show you an exaggerated section of the arrangement (fig. 4). Here is the sheet of glass which bears on its surface the sensitive film, and this is the mercury.

I must now ask your careful attention to fig. 1. We have here a ray of light, which we will call A B, proceeding in the direction of the arrows, and the small dots we will assume to be the particles of ether, which are

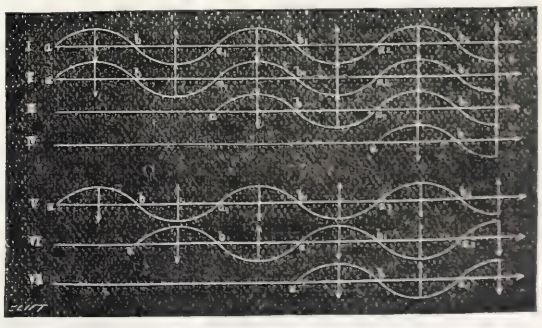


Fig. 5.

supposed to vibrate backwards and forwards, as shown by the small arrows. Now, A B is the direction in which the light is proceeding, *a c* s called a wave crest, *b c* a wave trough, A D the wave length, A *c* or *a b*

half a wave length, the distance *a b c* from A B is called the amplitude. Now, if we send another ray of light along the same path, or several, they will all travel the same way, their crests and troughs will coincide, and we shall get more light, as shown here, fig. 5 (I., II., III., IV.). But it may happen that the waves of light do not start from the same point; we shall then get more light, provided the crests and troughs still coincide; if they do not, but fall together, but in opposite phases, as in V., VI., then they interfere with one another, and the ray of light is extinguished.

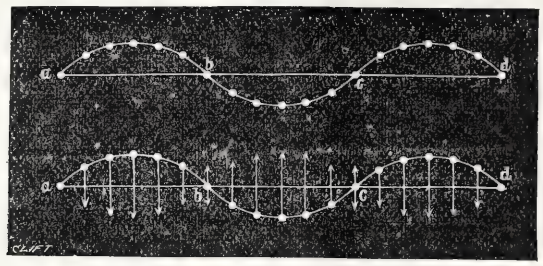


FIG. 6.

We have been supposing that the rays are all travelling in the same directions; let us see what will happen supposing the one ray of light begins at the opposite end or travels in the contrary direction. In fig. 6 you see the single ray *a b c d*, and in this the action of the returning ray, returning along the same path, and you will see that at the particular points *a b c d*, the pull, if I may term it, of the ether particles is equal in

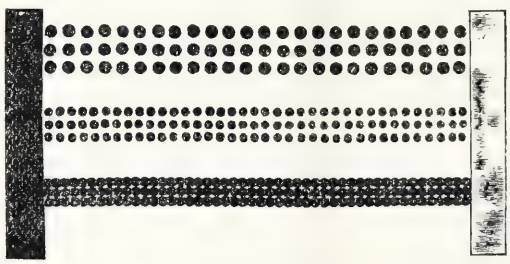


FIG. 7.

both directions. You have all seen a tug of war at some athletic sports; well, imagine that to be the case here. We have two teams or forces equally matched pulling in opposite directions, and obviously nothing moves; well, that is just what happens in the case of the light, and whilst here we get increased light, and consequently increased chemical action, so at these points, *b c*, we get no light and no chemical action. Such light waves are called stationary or stagnant waves, and in this (fig. 7) you see the action of such rays on a sensitive film. Where we get the light we have chemical action, which is proved by development causing a deposit, whilst in between there is a space where there is no light and no chemical action and no deposit; consequently we get a series of layers or particles of silver, alternating with blank spaces. The variation in distances of the dots is an exaggerated section of the sensitive film, showing the distances apart of the silver for the red, yellow, and blue rays.

Now let us turn back to our first ray of light. I pointed out to you that A D was a wave length, and we saw that a ray returning along the same path caused an interference or stagnant point at B D C A, and obviously these points are exactly half a wave length apart, and mercury is used in the cell to merely reflect the light back on itself.

Now, when a ray of light strikes one of these films or photographs in natural colours, it reflects only that light which has a wave length double the space between these two points—that is, light of any other wave length is not reflected, consequently we get the particular colour which caused these points. This is the explanation of how photographs in natural colours are taken; *per se* these photographs have absolutely no colour, all they do is to sift out of white light the particular ray which made them, and this, striking the retina of the human eye, gives us the sensation of colour.

If you will think for one moment that almost all photographic images are metallic, you will easily understand that we can hardly expect to reproduce by printing the actual colours—that is, we have no single element or compound which can take upon itself every colour of the spectrum, and the millions of tints made by admixture of these colours.

Lippmann used, first of all, Taupenot's albumen process, which consists practically of using iodide of silver suspended in albumen; later, he used bromide of silver suspended in albumen, but he met with one great difficulty, and one which every practical photographer meets with in ordinary practice, and that is, that the silver salts are more sensitive to the blue and violet than to any other colour, or, to put it more popularly, the photographic plate sees the blue and violet as the brightest part of the spectrum; therefore he exposed his spectrum in sections, using a deep orange red screen, and giving one hour's exposure to get the red, and then five to ten minutes for green with a yellow screen and a very pale yellow screen, and twenty to thirty seconds' exposure for the blue. After exposure, the plates were developed with pyrogallol and fixed, washed, and dried.

Naturally, when the accounts of Lippmann's experiments were published and results confirmed, many had a good try to do the same thing. Kroné, of Dresden, was one of the first, and he used albumen plates, but, instead of mercury, he used black velvet.

Chas. R. Thwing, in 1892, used collodio-bromide plates, and reduced the exposure to twenty minutes in the sun.

M. de St. Florent, in 1892, exposed an ordinary gelatino-bromide plate with an orange screen under a coloured transparency, and then, without developing, fixed and washed it, and it was said this plate, whilst damp, reproduced the colours.

In 1892, MM. Auguste and Louis Lumière showed, at a meeting of the Société des Sciences Industrielles, of Lyons, some spectra produced by Lippmann's method, which were superior in brilliancy. These were made on gelatino-bromide plates.

In 1892, Valenta published some experiments on the preparation of such an emulsion, and a year later Lumière published their formula. I think I am at liberty to state here that these lectures will be printed, and that numerous formulæ and quotations from other writers and lectures will be given as appendices to the lectures themselves; if I had attempted to do more than sketch in roughly the various steps and stages of experiments, I should have been obliged to give, not two, but seven or eight lectures, and my endeavour has been to present the subject to you in a manner which will enable you, as well as the lay or non-photographic mind, to grasp what a photograph in natural colours is, and how it is made.

Experiments have not been wanting as to the possibility of obtaining these photographs without using silver salts, and on October 24, 1892, Lippmann showed, at the Paris Académie des Sciences, some results obtained with bichromated gelatine, and St. Florent is stated to have obtained results with ferric chloride and gelatine. Before showing you

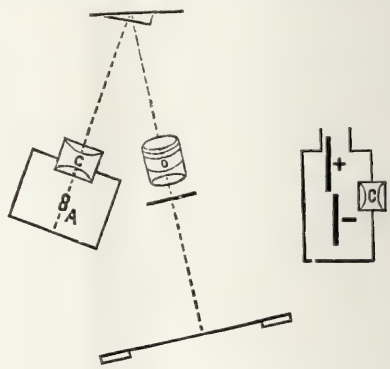


FIG. 8.

some results, I will explain how they are projected on the screen (fig. 8). A is an electric lamp, C the condensers, and D the objective. This, at the side, shows the disposition of the carbons more clearly, but an explanation will only interest photographers. You will notice that the photograph is prismatic in shape; this is to avoid disturbing reflections from the surface of the glass.

We have seen that the colours in these photographs are produced by the interference of thin films, and all thin films give colours. I call to your minds mother-of-pearl; the colours in this are caused by thin films, or laminæ. An opal shows colours, it is said, from interstitial laminæ of air—mica selenite, and other substances do the same thing, and you all know the exquisite colours on a soap bubble.

But I may be able to show you to-night what some of you have no seen before. You know that the Romans possessed the art of glass-making, and that some of their glass has been found within late years. Glass exposed to the action of air, water, and the moist earthy acids, becomes partly disintegrated, and splits up into very thin films, or becomes iridescent. Mr. Thomas Bolas, the editor of *Photographic Work*, has been kind enough to lend me a bit of this glass, which I will hand round. It proves very satisfactorily a statement which has been made about these photographs of Lippmann's. You will remember I stated that the silver deposited in layers of definite half-wave length reflects light of a particular colour. The question naturally arises, What becomes of the rest of the colours? Well, this little specimen of glass answers the question very satisfactorily. Looking at this glass by reflected light, you see one little piece of brilliant green, the other a yellow; hold it up and look through it, and you will find the green has become a purplish red, and the yellow a blue, so that in these photographs of natural colours we get, on looking through them, the colour which is formed by the combinations of all the colours which are not reflected; that is what are called the complementary colours.

You have seen the spectrum colours produced by this method; you may naturally ask, What about mixed colours? For instance, could they take a photograph of a landscape, &c., and reproduce it in its natural

colours? I can answer that in the affirmative. Lumière's specimens, which we shall show, include a landscape, or at least a garden bathed in sunlight, and with all its colours of flowers, leaves, gravel, &c. One other specimen which particularly struck me was an interior of a laboratory. At a bench was seated a chemist, before him was a brass microscope, a scientific periodical, and various pieces of apparatus, and bottles filled with liquids, and to show you how perfect was the rendering of the colours, you could recognise the colour of bichromate of potash solution and sulphate of copper; further than that, it reproduced the metallic brass colour, and the peculiar fluorescent tinge of eosine. The specimens were not perfect, however; there were spots, and the chemist was represented with a greenish moustache. Not only can coloured lights be rendered by this process, but pigments also, for a small coloured sketch of a French soldier you will see on the screen. E. J. Wall.

SCREENS AND PLATES.

There is no doubt but that with our present methods of working, especially in copying pictures and brilliantly coloured objects with orthochromatic plates, a screen is absolutely necessary to get the best effects. The expense of optically ground-glass screens has instigated the use of films of coloured collodion and gelatine in lieu of the more expensive glass. I would suggest that the sensitive *plates themselves* are coated with a properly tinted collodion, or other easily removable coating—collodion occurs to me as being especially suitable, being so readily removed by washing before development and easy of application. Plate-manufacturers might supply plates already coated with films of varying colour density; the actual colour could be indicated by numbers or actual tints on the outside of the packets, or they could be prepared at home with the greatest facility before putting in the dark slides. The rapidly drying quality of collodion and the extreme thinness of the film formed *might* have the additional advantage of securing the plate from the action of faint light from reflections in the camera, &c., and make no difference to the definition of the image. There would, I believe, be very little difficulty in securing an even coating, no more, in fact, than preparing a collodion wet plate, and the advantages of having plates all ready without extra trouble of selecting screens is patent to all.

Edward Dunmore.

"BARNET" PLATINO MATT-SURFACE BROMIDE PAPER.

Undoubtedly the introduction of matt-surface bromide papers marks an advance in this description of printing surface, not less, if we may so say, in the technical than in the artistic sense. Over the old form of bromide paper the new kind appears to have a twofold advantage. The surface is of that dead matt nature which is so welcome to the refined taste, besides possibly having a practical superiority for working up, finishing, &c. The improved quality of the resulting image is also noticeable, for, whereas in the old kind of bromide paper the scale of gradation was felt by many to be too abruptly shortened, this defect is not apparent in the new kind. The latter, indeed, appears to us to give a lengthened, and therefore a truer, gradational rendering of the negative, the consequence being an absence of blocking up in the shadows, and the production of results both pleasing and harmonious.

Messrs. Elliott & Son, of Barnet, are introducing a paper of this kind—the "Barnet" platino matt-surface bromide paper—upon which we have seen many beautiful prints, having a delicacy, softness, perfection of detail, and well-harmonised gradation not indistinguishable from the finest effects on platinum. We have, besides, subjected the new paper to practical tests ourselves, using negatives of various degrees of opacity for the purpose. A point deserving attention in our tests was the presence of detail in the very deepest shadows. A minute's exposure to a candle flame at a distance of about fifteen inches sufficed with negatives of average density, and development with metol produced charmingly soft results. Both for landscape and portrait work the new paper appears peculiarly suitable. For development the makers recommend ferrous oxalate, and also strongly recommend the following metol developer:—

A.

Metol	400 grains.
Sodium sulphite	8 ounces.
Potass bromide	50 grains.
Water	80 ounces.

B.

Potass carbonate	8 ounces.
Water	80 ,,

Take three ounces of A and one ounce of B.

The image should appear in a few seconds, and development will be complete in about two minutes. Rinse in three changes of water, and fix in fixing bath 4 : 20. To produce softer results, either of the above may be diluted with an equal quantity of water. After fixing, wash thoroughly in several changes of water for at least two hours, squeegee off the superfluous moisture, and hang up to dry.

MR. THOMAS FALL'S PHOTOGRAPHIC EXPERIENCES.

There can be no doubt that Mr. Thomas Fall's wealth of photographic anecdote is unrivalled. His charming, unassuming manner, his piquant jokes, his scathing sarcasms, and, above all, his straightforward policy, have an attraction for all with whom he comes into contact. He found an appreciative audience in the members of the South London Photographic Society on Monday evening, the 18th inst., when he recounted some of the experiences he had had during the past forty years, and gave some of his less fortunate brother professionals who were present some excellent advice.

Mr. Fall's first notable experience in connexion with photography was the forming an alliance or partnership with another photographer. Mr. Fall was the business man (being a Yorkshireman, he was, of course, well qualified for that position), whilst his partner did the photographic work. They obtained permission from the owner of a large factory to take photographs of the *employés*, and it was their intention to sell these pictures framed to the men at so much a head. When the work was completed, and the sum that it would bring in was estimated, his partner got nervous, and doubted whether they would obtain so much money for the pictures, for it seemed to him that they were charging too much. Mr. Fall, however, thought they were worth the money, and offered to buy his partner's share in the business, his offer being accepted. He then waited until pay night came round, and, stationing himself at the factory gates with the framed pictures and some paper ready to wrap them up in, he showed the men, as they came out, their photographs, and eventually sold them all, and received the money, except in one case; and, he stated, with a twinkle in his eye, that, although it was now more than forty years ago, he had not forgotten the circumstance, and he could not for the life of him understand how that man had cheated him out of his money.

In those days photographers were very scarce, and were treated with great consideration wherever they went—driven about in the carriages of the upper classes, feasted, and made much of. There were three processes then in vogue—the "beer" process, the "coffee" process, and the "tannin" process. He himself found favour with the tannin process. The exposures, however, were simply enormous; he used to get his camera ready, and whilst the exposure was being made would sometimes take a long walk. One day he was taking some views in a gentleman's park, and had gone indoors to refresh the inner man whilst the exposure was proceeding. Suddenly one of the daughters of the house came rushing in, and exclaimed, "Oh, Mr. Fall! one of the young horses has kicked your camera all to pieces!" He found that this unexpected catastrophe was indeed true, but the camera had been put together in such a manner that all the joints had conveniently given way, nothing being splintered, and with very little trouble he was able to put it together again.

Thus Mr. Fall went on, relating experience after experience, and told how, having tired of the humdrum life of the provinces, his ambition brought him to London.

Speaking of the manner in which customers should be treated, he said that a lady had brought back some photographs to a well-known photographer with the complaint that, although they were good photographs, they were not like her. The photographer, who was a pompous man, said: "Well, madam, you say that they are good photographs, and yet that they are not like you. Of course, if you wish us to take you again, we will do so, but, *we shall have to charge you for the extra sitting!*" That lady without doubt would never patronise that man again. What he (Mr. Fall) would have done in such a case would have been to say, "Well, madam, now I come to examine the photograph, I can see it is not exactly like you, so I must take you again. Can you favour me with another sitting now?" The lady, perhaps, has come prepared to be photographed again, and a negative is obtained this time which will be a source of revenue for years to come. A man charging a good price for his work, and who does not go in for "cutting," can afford to use an extra plate or two in this way.

With regard to retouching, he advocated as little as possible. He said it was the general practice nowadays to carry it too far, until, in fact, almost every line characteristic of the person had been obliterated. Some retouched their work so much that the individual looked like a perfect idiot.

In his concluding remarks, he referred to the judging of pictures at exhibitions, and stated that the present system was very unsatisfactory to all the exhibitors. Many of the persons who now officiated as Judges had personal fads, and, unless the work exhibited came within the range of their faddism, it was superciliously passed by. There were many other reasons which tended to show that an alteration is urgently necessary. What he suggested was, that, instead of Judges being appointed, the members of a Society (such as the Photographic Society of

Great Britain, for instance), who are supposed to know something about photography, and would appreciate the difficulties under which individual pictures were taken, should record their votes, and the picture receiving the most number of votes should be considered the best, and so on. He said he had only exhibited once. He sent some very fine interiors to a country exhibition, and eventually was informed that he had won the bronze medal. The Secretary and President wrote to him, stating that they could not understand why his pictures only got the bronze medal, as the pictures that obtained the silver were far inferior to his. Mr. Fall, however, said that it afterwards came to his knowledge that the man who had presumedly beaten him happened to be the foreman of the works of which one of the Judges was the proprietor. Mr. Fall gave away his medal to somebody, and then determined never to exhibit again. This determination he has ever since firmly adhered to.

IMPORTANT AMERICAN LAWSUIT.

A DECISION has been given in the Circuit Court of the United States, district of Massachusetts, in a matter which has been in litigation for a considerable period. It is that of the Eastman Company *versus* The Blair Camera Company. The opinion of the Court was given on June 1 by Judge Colt as follows:—

The two patents in controversy in this case are for improvements in photographic apparatus. The first patent was granted to David H. Houston, October 11, 1881, and is No. 248,179; the second patent was granted to Walker and Eastman, May 5, 1885, and is No. 317,049.

In the old photographic camera the plate upon which the image of an object was taken was made of glass covered on one side with a thin film of sensitive material. The film consisted of collodion, sensitised in a bath of nitrate of silver, and exposed in the camera while wet. This was known as the wet process. This form of apparatus was cumbersome, and difficult to operate in the field.

In 1880, Mr. Eastman, one of the inventors of the Walker and Eastman patent, commenced the manufacture of dry plates. These plates were coated with film composed of an emulsion of gelatine and bromide of silver, and then dried, but they were open to the objections of all glass plates, namely, they were heavy and liable to break.

It was sought to overcome these objections to the use of glass plates by the substitution of strips of sensitised paper supported on rollers.

A camera must be so constructed as to exclude the light, or, as commonly expressed, it must be a light-tight box. It is apparent that where a long strip of material was used it became necessary to devise some means to determine the position and movement of the strip in the camera. This was done by marking off the strip into lengths proper for exposure before introduction into the camera, and by inserting a coloured window in the box, through which the operator could observe the marks on the paper from the outside.

A device of this type, which appeared in 1875, is known as the Warnerke roll-holder, and is described in Abney's *Treatise on Photography*, and other publications. It consisted of a light-tight box containing two rollers and two rounded bars or guides, and the sensitised film was wound from one roller to the other over the exposing bed; one end of each projected through the side of the box, and was provided with a mill head and lock nut. The sensitised film was previously marked by black patches of paper, which could be seen through a coloured glass window at the back of the holder.

The defects in this form of construction were: First, it was difficult to mark the strip without injuring it; second, the coloured glass window did not form a perfect protection to the entrance of white light into the box; third, it was difficult to observe the division lines on the strips through the window.

In 1877, E. & H. T. Anthony & Company made one roll-holder after the Warnerke pattern, but slightly modified in structure.

This is also found described in a London publication entitled *Notes and Queries*, published in 1855, what is called "Captain Barr's Dark Slide for Paper." In this apparatus the paper used in connexion with the rollers was in short lengths secured to a band of calico, leaving intervals of about two inches between the lengths. The indicating device consisted of a short roller outside of the box fitted to one of the inside rollers, on which was wound a tape of the exact length of the calico strip.

There were numerous defects in this apparatus, and it does not appear to have ever gone into use.

Before the inventions of Houston, and Walker and Eastman, there were two problems which had to be met in the practical use of a long strip of film in a camera—the sensitised strip must be properly marked, and it must be held in sufficient tension. These inventions solved these problems.

The Houston improvement consists in attaching to substantially the old Warnerke roll-holder a device for marking automatically the sensitised material within the camera in such a manner as to form guides by which the operator can cut the film between successive exposures when taken into a dark room. This is accomplished by placing a pointer outside of the box connected with one of the rollers, which indicates revolutions of the roller, one revolution measuring half the length of the negative, or two revolutions the whole length. The same roller which carries the pointer also carries a pin, which perforates the edge of the material at each revolution, and consequently every other perforation marks the space between the negatives.

By this device something more is done than merely measure the length of film which passes between the rollers. The pointer outside of the box indicates accurately when the film has advanced sufficiently for each negative or exposure, at the same time the pin on the periphery of the roller marks the exposed length in such a way that the division line can be readily detected in a dark room.

This was clearly an improvement over anything which existed in the prior art.

The defendant attacks the validity of this patent by the introduction of various old registering devices for measuring cloth and other materials. A type of this class of machines is found in the Dodson patents of January 20, 1880, and August 3, 1880, and it is upon these patents that the defendant chiefly relies. The machine of the Dodson patents is for measuring cloth or bagging. The material passes over one roller and under another roller, then over a measuring cylinder to a spindle upon which it is wound. The measuring cylinder has points on its periphery, and a tooth at one end of the cylinder outside of the frame, which works with a toothed registering wheel, and another tooth on the inside of the frame, which works a click spring; the cylinder is described as being exactly a yard in circumference, and provided with projecting points, which enter the bagging and prevent it from slipping. By this device the registering wheel operates to register the number of yards unwound from the roll, while the click spring enables the operator, by counting the clicks, to know how many yards have been unwound.

In all the cloth-measuring and registering devices which existed in the art prior to the Houston patent, as disclosed by this record, there is not found the special feature of the Houston invention, namely, a projecting pin which spaces off and defines, for the purpose of cutting, a certain given length of the material. Some device of this kind was necessary in a camera using a strip of film, and, although such device may seem only a modification of old devices, yet, as the result accomplished is new and useful, I think it patentable.

On the question of infringement of the first and second claims of the patent, I have no doubt; the defendant's device embodies the essential features of the Houston invention, and the changes which are made are merely structural.

The Walker and Eastman patent represents a still further advance in the art.

The strip of film ready for exposure must always be kept in a condition of tension. As the camera may be left standing for days, it was found that the film was liable to contract or expand under different conditions of weather, and, further, in the old apparatus the devices for holding the film in tension did not always work perfectly.

The object of the Walker and Eastman patent was to remedy this defect.

The inventors spent months of effort before they hit upon the device which is the subject-matter of their patent. The means employed by them were simple, but this fact does not detract from the merits of the invention. The improvement consists in the insertion of a spring in the receiving reel which operates to take up the slack end of the film, or to always draw the film against the resistance of the spool. The spool and the receiving reel, with their retarding mechanism, will, under the ordinary process of feeding the film along, hold it in tension; but this is not sufficient to answer all the conditions which arise in the use of the instrument. By the addition of the spring this defect was overcome, and the film maintained in tension under all conditions.

The fact that the Walker and Eastman device has gone into general use, both in this country and abroad, proves the utility of the invention; and, if the question of invention were in doubt, this circumstance should weigh strongly with the Court in resolving that doubt in favour of the patentee. Smith *versus* Goodyear Dental Vulcanite Company, 93 U.S. 486, 495; Consolidated Valve Company *versus* Crosby Valve Company, 113 U.S. 157, 171; Magowan *versus* New York Belting and Packing Company, 141 U.S. 332, 343; Topliff *versus* Topliff, 145 U.S. 156, 164.

The validity of this patent is attacked on the same line of defence as the Houston patent. I shall only refer to one of the prior patents which are introduced as anticipations. I confine myself to this because it comes closer to the patent in suit, and is chiefly relied upon by the defendant. This is the Mann patent of August 8, 1876, for improvement in map racks. In that apparatus there are two rollers close together, and the map is wound from one roller upon the other. These rollers are geared together by either cog or friction wheels, so that, on turning a crank, the two rollers move in unison. There are also two additional guide rollers situated above and below the centre rollers. The map to be displayed passes from the upper centre roller under and over the upper guide roller, then over and under the lower guide roller, back to the lower centre roller; the lower guide roller is journalled in slides, which move in the framework, and springs are introduced above these slides which cause the roller to move downward.

An inspection of the Mann patent demonstrates that the organization of rollers, brakes, and springs is quite different from that found in the Walker and Eastman patent. *In fact, there is nothing in the prior art which anticipates this invention.*

The defendant's apparatus, though modified in some particulars, is clearly within this patent, and I am of opinion that it infringes the third, twenty-sixth, twenty-ninth, thirtieth, thirty-first, and thirty-second claims.

The phrase, "acting to maintain the film in a tense condition during exposure," in the third claim, does not mean, as contended by the defendant, that the tense condition is only maintained during the instant of exposure, but it should be construed as meaning that the film shall always be acted upon by such instrumentalities that, when exposure takes place, it will be found in a tense condition.

Decree for Complainants.

"IN BORROWED PLUMES."

The introduction of photography, as forming a distinctive trade of its own, was viewed by a certain section of artistic workers with considerable alarm, and, as subsequent events proved, such alarm was not unnatural, for its advent was destined in the near future to entirely revolutionise the art of miniature painting as then practised, and thus almost deprive the followers of that branch of art of their usual means of subsistence, and henceforth, as might be expected, there seemed to arise a certain feeling of jealousy between the artist-painter and the photographer.

Although artists, as a rule, have not been slow to recognise the value of photography, and have readily accepted the benefits which the camera affords by its literal and rapid transcripts of natural objects, yet, on the other hand, it is a matter for much regret to find that many professional photographers have ever been most reluctant to openly acknowledge the trained skill and ability which they have constantly received from their brethren of the brush.

Now, as the production of highly finished miniatures of the old school of that art became doomed, one of the greatest drawbacks photographic work had to contend with, especially when *cartes*, cabinets, and other paper work came conspicuously to the front, was the entire absence of colour. The masses did not then, and very little more so do they now, understand and appreciate the photographic representation of one of their kith and kin destitute and devoid of all the coloured attributes of life; and on many occasions have the following sentences been heard by country professionals: "Eh! that be loike oor Jeem, but 'twould be more gradely loike ef 'e 'ad a bit ov color;" and, as the "bit ov color" was not forthcoming by photographic aids alone, the photographer was compelled to obtain the assistance of his artist brother, and speedily found that by doing so his income began rapidly to increase, and his coffers to fill. Coloured photographs, in any medium, whether crayons, oils, or water, soon became the rage. Portrait clubs were formed throughout the country; not only in provincial towns were they to be seen on every side, but in the metropolis as well. Now, it would not be unreasonable to suppose that such a combination of mutual benefit would have knit both photographer and painter in a closer bond of interested friendship, but unfortunately it was not so, as the former seemed to resent the fact that he, unlike the latter, was not able to produce a coloured picture unaided and alone, and thus, as an outcome of this foolish resentment, he most unfairly grudged the painter his share of any praise that might be bestowed by their patrons on any work produced by their joint efforts.

It may be remembered that, a few years ago, there was some excitement caused about certain portraits, then on exhibition at the Royal Academy, as to whether these pictures did not owe their origin, either directly or indirectly, to photography, and so decided were the opinions of the Royal Academicians on this point that all pictures intended for exhibition at Burlington House must be the genuine *bonâ-fide* handiwork of each exhibitor, that the "*elect Forty*," with most commendable promptitude, gave all intending exhibitors to understand that they would not allow (as far as laid in their power to prevent it) any one to appear "in borrowed plumes," or "to sail under false colours;" and, moreover, it is doubtless well known to many of your readers that, to ensure the absolute genuineness of all work sent in by young persons for election as students of the Royal Academy, and admitted as probationers, the same drawing has again to be reproduced within the walls of the Academy, and under the immediate supervision of the Academicians, to incontestably prove that the original work submitted was a genuine exposition of such a student's ability, yet we find frequently at a photographic Society's Exhibition, where medals are awarded, that the work sent in for competition is *not* the entire work of the competitor; as, for instance, he may have only taken the negative, and finding that, in order to produce a satisfactorily finished picture, he has to call in the skilled assistance of some half a dozen other persons, and he coolly enters the lists as a competitor against another man who has produced his own work entirely. This is obviously most unjust, and surely there should be some restrictions enforced at all Exhibitions to prevent such unfair competitions, and when a medal is awarded to the works of the first-named individual (?), he has the cool presumption to appropriate the much-coveted prize entirely to himself, and, while quietly ignoring the valuable services that have been rendered him by others, to boast how *he* had won the medal by *his* superior skill and ability. But not alone, as far as Exhibition medals and awards are concerned, does this state of things exist, for whether it is where the services of a retoucher or an artist, either in monochrome or colours, are employed, this same intolerant assumption of another man's talents and abilities largely prevails. In calmly contemplating this masquerading "*in borrowed plumes*," how exceedingly mean and contemptible all acts like these must and will continue to appear to well-regulated minds, and how ludicrous and ridiculous such an individual must look when asked to make some trifling alterations in a picture that he has professed himself to have painted; and what a veritable "ass in a lion's skin" must be his appearance when he stammers out, in the midst of the overwhelming confusion which his own mendacity has created, his inability to make the required alterations "unless he takes the picture home." He would be well advised to remember that we have the "Highest Authority" to give "honour to whom honour is due," and also "to render unto Cæsar the things that are Cæsar's;" and, further, for future guidance, he should impress on his mind and brain the following slightly altered version of the words of the immortal bard:—

> "He who steals my purse steals trash.
> 'Twas mine, 'tis his, and has been slave to thousands.
> But he who robs me of my good name (and fame),
> Which, while it should not enrich him,
> Takes that that leaves me poor indeed!"

PIONEER.

ILFORD ISOCHROMATIC PLATES.

Previous to speaking of a practical trial of the Ilford Medium isochromatic plates which we have recently made, we will mention a circumstance connected with their keeping properties which may be of interest to the users of isochromatic plates. A packet of these plates, which came into our possession about two years ago, was the other day opened, and some of them exposed and developed, the result being that we found the plates in admirable condition, yielding clear, bright negatives of good quality. Curious to ascertain whether any diminution of sensitiveness had supervened, we subjected some of the plates to comparative trial against some isochromatic plates of the same brand only lately made, the result being that we found the older plates every whit as sensitive as the new ones. Our experience, which we do not doubt will be readily confirmable by others, should help to dispel any idea that may be abroad as to the lack of keeping qualities of isochromatic plates.

The advantages of employing colour-sensitive plates in reproducing coloured pictures, &c., are so well known as to be obvious to most photographers, and therefore it is not necessary for us to speak of the Ilford isochromatic plates at any length in this regard. Suffice it to say that our experiments in this department of their uses amply testify to their value. Selecting for the purpose test pictures in which the colours blue green, yellow, and red were present, we first made a trial, without a screen, against an ordinary plate, the isochromatic plate giving generally a distinctly truer translation. With a screen the advantages of the colour-sensitive plate were more apparent, the blue and yellow being rendered in perfect relative intensity. By the way, the Ilford screen is a singularly neat and effective adjunct. The little holder or frame may be readily screwed on to the back of the lens front. The yellow glass slips into the frame, and, when not required for use, can be easily removed, the frame remaining *in situ*, and not interfering with the path of light through the lens.

It being claimed that the No. 1 light screen which we used necessitated an increase of the exposure three times, we subjected the matter to experimental trial by exposing a single plate, one half without a screen, the other with, giving the latter a threefold exposure. On development both halves came up virtually together, and ultimately presented no discoverable difference.

The sensitiveness of isochromatic plates to the green and yellow regions of the spectrum clearly gives such plates an enormous advantage in landscape work, and when it is remembered that, by the use of the yellow screen, the light from a blue cloud-flecked sky is partly cut off, and the clouds themselves allowed to impress the negative, their value

further enhanced. Especially in landscape work have we been pleased with the truthfulness of tone-rendering which the Ilford isochromatic plates assure for us. Dark and light greens in juxtaposition, yellow-leaved water lilies, were obtainable in true relation, and, by the use of the screen, clouds which in an ordinary negative would be lost. The plates also appear to us to decrease the effects of halation where it is commonly met with in landscape work. Succinctly put, the advantages of isochromatic plates in landscape work are that, where an ordinary plate, even with a supposedly correct exposure, shows something approaching to bare glass where the greens and yellows have acted, the colour-sensitive plate gives a gradationed result, with plenty of detailed deposit in those parts, from which it follows that the resulting print will show a harmony and gradation having the true fidelity of the original subject. We can cordially endorse all the good qualities claimed for the Ilford ischromatic plates.

CONVENTION TRAVELLING NOTES.

We are apprised by the London and North-Western Railway Company that certain advantages may arise from intending visitors to the Convention proceeding to Dublin by a cheap excursion train they are to run from London to Ireland on the night of Thursday, July 5, leaving Euston Station at 9.10 p.m., and arriving in Dublin, North Wall, the following morning. The return fare is 25*s.* third class, and deck passage on boat, but, on presentation of tickets at the Holyhead booking-office, saloon tickets for going and return passages will be granted on payment of 8*s.* extra. The duration of the excursion is a fortnight, but any one may return on any desirable date within the fortnight. Tickets for this excursion are issued, at corresponding rates of reduction, from all towns served by this railway. For example—from Birmingham the fare is 17*s.*; Manchester, 12*s.*; Leeds, 14*s.* 6*d.*; Liverpool or Chester, 9*s.*, and so forth. For an additional 11*s.* 6*d.* passengers may proceed to and from Cork, Killarney, Limerick, and other places; or, for smaller additional sums, to Galway, Sligo, Roscommon, &c. For detailed particulars we recommend application to the offices of the London and North-Western Railway.

[In connexion with this subject, Mr. W. D. Welford, of 59 and 60, Chancery-lane, informs us that he is endeavouring to form a party to secure a reduction in the fare. In order to secure this reduction, ten tickets at least must be taken, and the figures work out this way, the full number saving one-fourth the ordinary fare:—10 persons, 1*l.* 8*s.* 5*d.*, saving 10*s.* 1*d.* each; 9 persons, 1*l.* 11*s.* 7*d.*, saving 6*s.* 11*d.* each; 8 persons, 1*l.* 15*s.* 6*d.*, saving 3*s.* each, the return ordinary fare being 1*l.* 18*s.* 6*d.*]

Our Editorial Table.

Beginner's Guide to Photography.—Fifth Edition.

Perken, Son, and Rayment.

Since we noticed the previous edition of this work, it has received several editions, being brought up to the state of our ever-advancing art as it exists at the present time. A commendable feature in the manual, and one to which we have formerly directed attention, is the plainness with which everything is described. Adopting the same terms we previously employed when reviewing the last edition, we have only to say of the present one that "the language employed is simple, and the instruction sound." Besides practical hints on photographic manipulation, there are useful chapters on hand cameras, stereoscopic photography, lantern pictures, and enlarging. We can recommend the book as a good and reliable manual.

Exposure Diagrams.

By N. G. Thompson, 13, Victoria Street, S.W.

Mr. Thompson's four cards of exposure diagrams cover the exposures estimated for all the year round, each of them representing two or more months of common value. They have been designed with a view to reducing multiplicity of results, by running identical values down to one common exposure; and, as such necessarily leads to considerable economy of space, it has been found possible to include, without detriment to portability, a greater number of controlling conditions than has ever been attempted before.

News and Notes.

Messrs. Adams & Co. write: "Our establishments at 81, Aldersgate-street, 26, Charing Cross-road, and 2, 3, and 4, Aldersgate-buildings, will be closed on Saturday next, June 30th, when our *employés* (fifty-four in number) will have their annual outing at Herne Bay."

At the Central Photographic Club, Henrietta-street, W.C., a small but good collection of photographs by well-known workers is on view. Messrs. Horsley Hinton, F. P. Cembrano, A. J. Golding, C. H. Oakden, Eustace Calland, M. J. Harding, and J. H. Avery are represented by some of their best-known efforts. Other well-known workers will, from time to time, send examples.

Still They Come.—A new photographic magazine will shortly make its appearance. It will deal with the popular side of photography, and cater for the interests of *devotees* to the camera in the elementary stage. Illustrations by photographic processes will constitute a prominent feature. The magazine will be produced by Messrs. Percy Lund & Co., and bear the title of the *Junior Photographer*. It will be conducted by "Matthew Surface," editor of the *Practical Photographer*.

Photographers' Benevolent Association.—Committee Meeting, June 21, 1894, at the registered office of the Association, Mr. Charles Faulkner in the chair.—Five cases were considered, and grants of 5*l.*, 2*l.*, 2*l.* 10*s.*, and 5*l.* were definitely made, while, in the remaining case, the Secretary was instructed to supply a camera if further references proved satisfactory. The Secretary reported that three applicants, who had been assisted at recent meetings, had now obtained work, and had prospect of permanency.

American Lantern Slides.—Mr. H. Snowden Ward writes: "In your report of the meeting of the Photographic Club, I am recorded as saying that the best of the American Societies now stipulate for the three-and-a-quarter slide. The question raised at the Club was not the size of the slide, but the size of the opening, and I said that some of the best American Societies stipulated that the opening of the slide should be not larger than three and a quarter square. I would not correct this little matter, but that the question of American *versus* English has been a vexed one."

An Optical and Photographic Exhibition will be held at the Royal Aquarium from September 11 to October 6. It will consist of a display of all matters connected with optical and photographic apparatus. Sales will be permitted. Competitions will be opened for both amateurs and professionals in animal, architectural, character studies from life, colour, group, instantaneous, landscape, lantern-slide and portrait photography. For all particulars address Mr. J. Ritchie, Managing Director, Royal Aquarium, London, S.W. A ballot has been taken on the question of the dates, and those selected have been approved by a large majority of prominent photographers.

A Rival to Celluloid.—A rival product has appeared, says the *Chicago Tribune*, which is said to be safe under all conditions, while possessing all the essential attributes of celluloid, alkaline thiocarbonate of cellulose, and obtained by treating that substance (celluloid) with a strong solution of caustic alkali, and subsequently exposing it to the vapour of carbon disulphide. The result is a swollen mass of a light yellow colour, the solution of which has an enormous viscosity, and from which the cellulose may be regenerated by means of common salt and alcohol. The cellulose is obtained in its new form as a gelatinous hydrate, and the degrees in its gradual regeneration are marked by an increasing tendency to form an insoluble jelly. It is suggested that the new material will be acceptable to technologists for such purposes as sizing and filling textiles, for producing casts and moulds, and as a paper indestructible by water for photographic films, and for numerous other purposes.

Nitrate of Silver.—Messrs. Fuerst Brothers write: "It having come to our knowledge that certain statements have been circulated which are calculated to disparage the quality of the brand for which we have the sole sale, we think it necessary to inform you that the nitrate of silver we supply is manufactured from pure silver, by one of the largest, if not the largest, London refineries viz., The Wood Street Smelting Works, in absolutely pure and uniform quality, as supplied to the trade for the last twenty-five years, and, until about a fortnight ago, through a firm of manufacturing chemists generally credited with having been the manufacturers of it. It will henceforth be known under its proper trade mark (a pair of scales, with the initials 'W. R.'), and, lest any of our friends should still have any misapprehension as to the quality, we would impress upon them that every batch of nitrate of silver is tested by an experienced chemist before it leaves the works, and we will guarantee its purity. We take this opportunity of advising you that we will shortly also introduce various other chemicals made from silver and gold."

Comparable with Silver.—Silvinite may be expected to sell at 2*s.* 6*d.* per pound this year. Several uses for the metal, to which it has not been applied before, will be found for it at this price. Silvinite, says the *Engineers' Gazette*, is an alloy of aluminium, which can be beaten out as thin as gold leaf, and has an appearance comparable with silver. For surgical purposes it is useful, as it is not acted upon by organic secretions. Its non-corrosive properties give it preference for the manufacture of articles in which acids act deleteriously upon ordinary metals. It "enamels" and "takes" oil colours beautifully, and sheets and plaques are being made of it in large quantities for artists. In type-printing it may soon be largely employed, since a small percentage of it in type metal adds much to its durability. Steel and other castings attain a greater degree of fluidity by an admixture of it. A very beautiful alloy is produced by mixing twenty-five parts of silvinite with seventy-five parts of gold, a rich tint being the result; and for the finest art castings, engraved, chased, and *repoussé* work, as great a finish is brought out as is

shown by electrotypes. It has no equal as a sonorous metal. It is proof against moisture, and will not split. Other uses in which it will be largely employed are for ship's furniture, propellers, launches, launch motors, yacht and torpedo boats and fittings, and all kind of nautical requirements; also valves for air brakes. It is almost absolutely proof against sea water, hence far superior to copper for sheathing the bottom of vessels. A small percentage of it mixed with copper serves admirably as a preventive of the increase of barnacles, mollusces, &c., thriving upon ships' bottoms. It is non-magnetic, hence it is being largely used for electrical appliances. It is also extensively employed for engineering and other scientific apparatus.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
2	Peterborough	
2	Putney	
2	South London	*Stereoscopic Photography.* Thos. Bedding.
2	Stereoscopic Club	
3	Birmingham Photo. Society	
3	Brixton and Clapham	Social Evening.
3	Exeter	
3	Hackney	Open Night.
3	Herefordshire	
3	Lewes	
3	North London	
3	Oxford Photo. Society	
3	Paisley	
3	Rochester	
3	Rotherham	
3	Sheffield Photo. Society	*Development for Beginners.* D. C. Brooks
3	West London	
3	York	
4	Leytonstone	
4	Oldham	Annual Picnic: Bolton Abbey. Leader, J. S. Dronsfield.
4	Photographic Club	Toning Platinum Prints.
4	Southport	
4	Southsea	
5	Birmingham Photo. Society	
5	Glossop Dale	
5	Hull	
5	London and Provincial	
5	Oldham	
5	Tunbridge Wells	
6	Brighton and Sussex	
6	Cardiff	
6	Croydon Microscopical	
6	Holborn	
6	Leamington	
6	Maidstone	
6	North Kent	
7	Croydon Microscopical	Excursion: The River.
7	Hull	
7	Liverpool Amateur	Exc.: Bolton Abbey. Leader, J. S. Brown.
7	South London	Exc.: Broxbourne. Leader, Mr. Fellows.
7	West London	Excursion: Up River, by Electric Launch.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JUNE 26,—Technical Meeting. Mr. T. C. Hepworth in the chair.

"DAYLIGHT" CARBON TISSUE.

Mr. H. A. LAWRANCE showed specimens of the Autotype Company's new "Daylight" carbon tissue. The novelty consists in employing a non-actinic material, such as paper, &c., as a support for the pigmented gelatine, so that, when the tissue is sensitised, it can be squeegeed in contact with an opaque support, and thus may be dried in daylight. To Mr. White is due the credit of the invention. Mr. Lawrance claimed several advantages for the use of the non-actinic support, chief of which was the facility for drying the tissue in daylight.

Mr. CHAPMAN JONES thought the daylight tissue would be a great convenience.

Mr. W. E. DEBENHAM remarked that ordinary paper used as a support was tolerably non-actinic.

In answer to the Chairman, Mr. LAWRANCE believed the tissue could be dried in sunlight. The Autotype Company did not intend to back up all their tissues in this way, but only such as were ordered.

PLATINOTYPE PRINTING.

Mr. F. HOLLYER gave a demonstration of the development of platinotype printing by the hot bath process. He said he had practised the process for fourteen or fifteen years. It was important in printing to keep the pads dry. For this purpose he used Wandle felt, which kept flat when subjected to a high temperature. The proper exposure could only be judged by experience, and he recommended printing in diffused light, as direct sunlight had a tendency to solarise the image. Having spoken of the qualities of the various papers made by the Platinotype Company, he said that the image on some papers dried darker than others after development, which was to some extent influenced by the texture of the paper itself. After exposure he rolled the prints faces outwards, and stored them in a large cylindrical tin case, in which a quantity of calcium was placed. For development he used a saturated solution of oxalate of potash made with boiling water, preferring a bath that had been some time in use. He maintained the temperature of the solution between 110° and 170° F., decreasing it for over and increasing it for under-exposure. A black scum sometimes settled on the top of the developing solution, which he removed with a strip of paper. This scum appeared more with some papers than with others. He used sufficient developing solution to maintain it at a depth of about an inch. For a clearing solution he used pure hydrochloric acid, 1:60, finally washing in three or four changes of water. He concluded by referring to a new kind of platinum paper (made by the Company) of a rough texture and giving beautiful rich tones. The demonstration of development was then proceeded with, several prints 38×24 being developed by gradual immersion from end to end. The rich tones of the new paper were much admired.

In answer to a question, Mr. HOLLYER said he had tried the new cold-bath platinum paper, and had found no advantage with it. He did not like development by soaking the prints in the solution, as he thought a certain amount of development went on from the back, which tended to flatness.

Mr. DEBENHAM inquired why Mr. Hollyer did not use the commercial hydrochloric acid instead of the chemically pure.

Mr. HOLLYER said that he found the commercial acid stained the paper.

Mr. T. BOLAS said the presence of iron in the commercial acid would not cause stains on the paper, the acid being a solvent of iron.

Mr. CHAPMAN JONES thought an impure acid might cause stains, and suggested the use of a final bath with the pure acid.

In answer to the last speaker, Mr. HOLLYER said he did not add anything to the oxalate solution. He once tried the addition of sodium carbonate, but thought it had a bleaching effect. Replying to Mr. Dixon, he said he did not think the waste solutions worth saving. Answering the Chairman as to which kind of negatives he preferred, he said, those developed with ferrous oxalate.

After other discussion and votes of thanks to Mr. Lawrance and Mr. Hollyer, the proceedings terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 21,—Mr. W. F. Slater in the chair.

Mr. G. W. Atkins showed a pair of five-inch doublet lenses which he used for stereoscopic purposes. He had purchased the glasses cheaply at a sale, and had mounted them, in accordance with a recommendation of Mr. W. E. Debenham, at a separation of eight-tenths of an inch measured from the convex sides. Mr. Atkins showed various negatives made to test the working powers of the lenses.

Mr. A. L. Henderson promised at a future meeting to show a wide-angle lens of about one and a half inch back focus, which covers a circle of between four and a half and five inches.

Mr. W. E. DEBENHAM said that he had in his possession a lens of three inches focus, which covered a half-plate except at the corners.

Mr. T. E. Freshwater passed round two photographs of the "Gladstone" rock in the Himalayas, so called from the profile of the rock having a supposed resemblance to that of Mr. Gladstone. The photographs were taken with a tele-photo lens from a distance of three-quarters of a mile.

Mr. Henderson showed the half of a stereoscopic negative, the definition of which was perfect except in a small central portion, where it was blurred. This was said by Mr. Henderson to be caused by a drop of rain falling on the lens.

Mr. Cowan having sent ten sensitive-plate strips that had received a series of graduated exposures, several of the members proceeded to develop them. At the conclusion of development it was suggested that the strips be forwarded to Mr. Cowan for photo-metrical measurement.

PHOTOGRAPHIC CLUB.

JUNE 20,—Mr. R. P. Drage in the chair.

A question from the box was read as follows: "Can any one give the reason for small black spots about the size of pinheads which appear after development on one make of extra rapid plates? They appear during drying."

Mr. NEWELL said that he had not found any such spots on the same brand of plates.

Mr. WILLIAMS suggested the presence of iron in the washing water.

Mr. TOTTEM showed negatives by Miss Forbes, which were made by the calotype process thirty-four years ago. He asked if any of the old workers, Mr. Haes or Mr. Foxlee, had any experience of the process.

Mr. HAES had made use of the process, as had also Mr. Foxlee, but it was so long ago that they could not give any reliable information.

Mr. WILLIAMS asked for a ready means of oxidising castor oil. He was using it in conjunction with collodion as a negative varnish.

Mr. FOXLEE said it could be done by using one of the methods which had been patented. There had been several patents for the oxidising of oils.

The CHAIRMAN asked if any one had experimented with the "new" carbon process. He understood the tissue was sent out mounted on its permanent support, and was developed from the front.

Mr. R. CHILD BAYLEY asked for information of the new daylight carbon tissue.

Mr. FOXLEE said that the Autotype Company had this latter now ready for the market. He thought it was likely to be very good, and of advantage to those workers who prepared their own tissue, as the work could be carried out in the light of an ordinary room.

The Chairman passed round for inspection an illustrated catalogue of the Japanese section of the Columbian Exposition at Chicago. The illustrations were from process blocks made by Mr. Ogawa, of Japan.

Specimen prints on Eastman platino-bromide paper were exhibited.

Mr. FRANK HAES asked for information concerning development of this paper prior to toning.

Mr. WEIR BROWN said one was apt to get over-density when working in this way. It was necessary to thoroughly wash out all traces of developer.

Brixton and Clapham Camera Club.—June 19.—Mr. W. THOMAS read a paper entitled *Notes on Pictorial Results with Stand Cameras.*

Hackney Photographic Society.—June 19, Mr. F. Houghton presiding.—Mr. DEAN gave a report of the excursion to Leatherhead on the 16th inst., and the ASSISTANT SECRETARY gave notice of excursion to Zoo, to take place on June 30, members to meet at band stand in Gardens at 2.30 p.m. Messrs. J. W. Sandwell and H. J. Wallis were elected members. Work was shown by Messrs. A. Barker, Guest, Houghton, Hudson, and Randall. In a short discussion *re* halation, Mr. DEBENHAM, who was present, agreed with Mr. BECKETT that caramel used alone was the best backing. Mr. MOORE, speaking of its effectiveness, mentioned the fact that he had exposed a caramel-backed plate for two hours in a church interior without any halation showing around the windows, although a strong light came through them. Mr. BIRT ACRES, of Messrs. Elliott & Sons, then demonstrated the carbon process. The carbon tissue is a compound of gelatine and pigment, and is rendered sensitive by means of a solution of potassium dichromate. The principle of the process is based on the action of light in rendering insoluble the chromatised gelatine. The tissue may be obtained ready-sensitised or unsensitised in any of the following tints:—Photographic purple, standard brown, engraving black, sepia, red, green, and blue. If sensitised tissue be obtained, it must be used within a short time of preparation, as under ordinary circumstances it will not keep long. From the fact that the image is made up of insoluble gelatine and pigment only, no unstable metallic compounds being present, it is one of the most permanent of photographic processes, while the demonstration showed that in beauty of result it is surpassed by none. Mr. Acres demonstrated the making of prints by both the single and double transfer processes, and also made a transparency, for which special tissue may be obtained. He pointed out the advantage of the carbon process in making transparencies for enlarged negatives, as he said that in a carbon print the scale of gradation is not altered, as is the case with silver bromide. After replying to various questions, Mr. Acres closed a most interesting evening by distributing samples of Messrs. Elliott's carbon tissue for trial among the members.

Woodford Photographic Society.—June 21, the President (Mr. H. Wilmer) in the chair.—Lecture by Mr. Henry Crouch on *Hand Cameras.* In his opinion the hand camera has now passed through what may be regarded as the first stage of evolution, and its multitudinous forms are settling themselves down to certain well-marked types, viz., the Magazine, the Roll-holder, and the still earlier form of double backs. Of these he regards the Magazine as the most suitable for a beginner to start with, while the Roll-holder has certain advantages in the matter of carrying a large supply of film; but this has, he fears, led to a great deal of careless work on the part of amateurs, who have found it difficult to separate and develop the film negatives properly. At present the tendency among experienced workers is to revert to the double backs, and, tending to more careful work, they having passed through the period when impulse to snap away at everything is too strong to withstand. The ideal qualities for a hand camera were summarised by Mr. Crouch under the following headings:—Lens should be capable of working at a large aperture, and should need no focussing arrangement when under five-inch focus, and used with *f*-11; when using a larger stop focussing becomes necessary. Shutter should work between the lenses, as such a shutter of simple construction is capable of giving an exposure of not more than one-four-hundredth of a second. A blind shutter cannot work so quickly as this unless it works in the focal plane, and then it produces a picture often seriously distorted. Finders of the present small sunk type in the corners are better dispensed with, but Mr. Crouch looks forward to the time (no distant date) when some inexpensive form of lens shall enable us to have an image of the same size as the plate in use similar to the present twin camera, but without the weight and cost. He counselled beginners to start with a single lens, and when they have mastered the use of it and the subsequent manipulation of the plates, to furnish themselves with a rapid rectilinear which will work well at *f*-8 or larger. In conclusion, the speaker mentioned that he and a friend are engaged in a course of experiments with lenses of various forms for hand-camera work, and when this work is completed he hopes to put the results fully before our Society at a subsequent meeting. The President showed a number of hand-camera negatives which he has recently taken at Antwerp. Various makes of plates were used, and the results showed that at least in his hands there was little to choose between them, all alike were excellent. Mr. Marriage showed some negatives of an early Norman doorway, taken respectively with a rapid rectilinear lens of nine-inch focus, and with a Dallmeyer tele-photo lens from the same standpoint. A comparison of the results showed very distinctly the great advantage to be obtained by the use of the latter for distant objects of small size. Mr. Melby showed some enlargements on Ilford bromide paper—one in particular, a reproduction from part of a small print on albumen paper—was much admired for its brilliancy and effectiveness, the grain of the original having been utilised to give very much the effect of a bold chalk drawing on rough paper.

Leicester and Leicestershire Photographic Society.—The first excursion of the season took place on June 14, when a visit was paid to the ancient town of Warwick, a town full of historical associations and interesting work for the photographer. After visiting the Bridge, where a number of plates were exposed, the members, led by the President (Mr. J. Porritt), made their way to the Castle, where, by the kindness of the noble owner, they had received permission to take photographs of the Castle and grounds. Passing through the embattled gateway, the party came to a road cut out of the solid rock, where the spreading branches of foliage form a canopy above, while the hop and ivy, creeping up the sides in sweet confusion, make a picture at once both pleasing and romantic. Proceeding on this road, about one hundred yards brought them into the inner courtyard. Here cameras were quickly at work, some paying especial attention to the fine polygon tower dedicated to Earl Guy and the venerable Cæsar's Tower, said to be coëval with the Norman Conquest, while others were bent upon securing pictures of the noble castellated mansion of the feudal barons of Warwick. Having obtained views of the Castle and its surroundings, the party retraced their steps to the porter's lodge, and, turning to the right down Mill-street, soon came to the half-timbered or magpie houses, which attracted considerable attention; while, at the bottom of the street, were found reaches of river scenery, an old mill, a broken bridge covered with a wealth of verdure, and other choice bits such as the votaries of the camera delight to secure. After partakiug of "the cup that cheers but not inebriates," under the shade of a rustic arbour in an old-fashioned garden by the side of the river Avon, the return journey was commenced. Comparing notes on the way, it was computed that about sixty plates had been exposed under most favourable conditions as regards the weather and the light.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,763.—"Photographic Plate-lifter and Rocker." H. C. R. SHARMAN.—*Dated June*, 1894.

No. 11,839.—"Screen and Printing Surface for the Half-tone Process."—Complete specification. M. LEVY.—*Dated June*, 1894.

No. 11,958.—"A New Combination of Camera and Compass so designed and arranged as to record photographically the Magnetic Bearings of Objects Photographed." J. B. LEE.—*Dated June*, 1894.

No. 12,109.—"An Improved Head for Tripods for Photographic Cameras or other Apparatus." Complete specification. J. E. TOUCH.—*Dated June*, 1894.

No. 12,114.—"Improvements in Camera Shutters." Communicated by L. F. EIDEN. E. T. HUGHES.—*Dated June*, 1894.

No. 12,119.—"Improvements in and relating to Photographic Cameras." W. A. DAWKINS.—*Dated June*, 1894.

No. 12,130.—"Apparatus for Holding and Distending Photographic Films and the Like." A. C. KITZ.—*Dated June*, 1894.

No. 12,162.—"Improvements in Apparatus for Mounting and Fixing Photographic Cameras." F. W. TURNER.—*Dated June*, 1894.

No. 12,163.—"Walking-stick Camera-stand." W. J. PICKERSGILL and M. HUNTER.—*Dated June*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN TRIPOD STANDS FOR PHOTOGRAPHIC CAMERAS AND OTHER PURPOSES.

No. 12,839. LEON AUGUSTE MARION, HENRI GUIBOUT, GEORGE BISHOP, FRANK BISHOP, JOHN PATTINSON KIRK, 22, and 23, Soho-square, London, W —*May* 5, 1894.

OUR improvements consist in fixing together three rods, or legs of wood, metal, or other suitable material, with a universal joint at a convenient distance from the top.

At the top of each leg is a double-hinged piece all of which can be brought together and clamped by means of a screw to the article to be supported, thus forming a table or "head." The legs can be made either rigid, sliding, or jointed, and of any suitable length.

A very convenient method of making it the "rigid" way is to take a circular piece of wood and divide it into exactly three sections of 120° each, and connect them in the manner described.

The "sliding" form can be very simply made of six or more tubes, half of the number sliding into the other half, and fixed at the required height by clamping screws, or other suitable device, the universal joint and hinged pieces being attached as described.

Our invention has for its object a simple form of tripod stand, the legs of which may be fixed perfectly by clamping together the pieces forming the head.

An Improved Gauge for Centering and Mounting Photographic Prints and the like.

No. 13,940. Charles Fulthorte Gooch, of Campville, Cathedral-road, Cardiff, Glamorganshire.—*May* 12, 1894.

The object of this invention is to provide an improved means for marking the position on cardboard mounts and the like for their photographic and other prints.

At present, as far as I am aware, no mechanical method for accurately and quickly measuring and indicating such position on the mount is in use.

My invention consists principally of a pair of sliding rectangular gauges of sufficient length to mark the largest cards that may be required. Each of these gauges is marked from a zero point at each end, and to a distance back, for the entire or any length necessary. These indications are, preferably, marked at each half inch, being again subdivided, half-inch distances, preferably, into thirty seconds, or any other suitable subdivision may be employed.

The outer side of one of the gauges is divided, for its entire length, into one-inch distances, each inch being again subdivided into sixteenths, these being, as will be seen, the duplicates of the scales upon the other sides of the gauge. At the zero point, a sliding clip is attached, adapted to hold a sharp-pointed pencil or marker. The point of the pencil is supposed always to be at the zero point and the object of the sliding clip is to facilitate its perfect accuracy.

Sliding along the two gauges is a metallic or other tubular clip of rectangular shape, so that the gauges may slide freely within. A suitable spring or other means of tightening the said sliding tubular clip may be employed. On the under side of this clip, or on the same side as the point of the pencil is placed, is a projection suitably formed to act as a gauge.

This projection can be of any convenient length, or width, or form necessary to ensure the gauge being held square with the card.

When a photograph or print is to be mounted, the picture is first measured on the inch scale in either direction, and the reading thereby obtained is marked off on the half-inch scale on the back of the gauge to which the pencil is attached, which will, of course, be half the size of the picture. The mounting board is then measured on the inch scale and the sliding tubular clip adjusted to the same reading on the upper half-inch scale.

The gauge is next taken in the hand, and the position thereby obtained marked off very much after the manner of a carpenter's marking gauge. The other dimensions of the picture are taken in a similar way.

The mount being thus accurately measured and marked, the print is laid to the lines and pasted down in the usual way.

Improvements in Photography, by which Coloured Objects are more Correctly Rendered.

No. 24,487. Arthur Burchett, 28, Willoughby-road, Hampstead, London, N.W.—*May* 19, 1894.

This invention relates to the method described in the specification of my patent, No. 9926, of the year 1892. I have discovered that I can also obtain the same results by colouring the Canada balsam with suitable media in proper proportions. I may either employ both colours (green and yellow) in a single combination, consisting of three lenses or more, each contact being separately coloured, or even a mixture of the two colours, in a single cement, for a lens consisting of two pieces of glass only.

I find the following colours suitable:—

Green.

Diamond green G	70 parts.
Metanil yellow	75 ,,
Aniline red	5 ,,

Yellow.

Saffranium	45 parts.
Chrysoidium	45 ,,
Coralline	10 ,,

In both cases the colours are dissolved in the smallest possible quantity of absolute alcohol.

These mixtures are applied by dropping one or two drops of the Canada balsam upon one of the glasses of the lens, the adjacent glass being then placed on it, and the two worked together in the ordinary way, the colour thereby becoming evenly diffused in the very thin film of Canada balsam.

If an unnecessary quantity of colour is employed, the speed of the lens is diminished.

The coloured cement may also be employed between plain glasses, to form screens, to be used in combination with photographic lenses.

Claim:—1. Compound photographic lenses, having a coloured medium interposed between the glasses, substantially as described. 2. Compound photographic lenses, substantially as described. 3. Screens of plain glass, having a coloured medium interposed between them, substantially as described.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

RESIDUES.

To the Editor.

Sir,—Seeing an article on residues in this week's paper, I thought it would not be amiss to give you a little paragraph on the same, as I am afraid not only the amateurs but professionals as well are frequently disappointed at their results from the refiners.

It was about twenty-five years since I was asked to take a wedding group at a gentleman's house near here. The lady who had been married was a relation of Mr. Johnson, of the then firm of Matthey & Johnson, Hatton-garden, and the firm is still carried on in that name However, in the course of conversation, Mr. Johnson asked me what I did with my paper clippings and washings. I at that time threw away. He advised me to save them and burn the paper clippings, and precipitate the washing and hypo solutions, and when I had collected a little lot to come to him and he would run them down for me, he having a nice little laboratory fitted up with all appliances. This I did, and, to my surprise, I had button after button of both silver and gold, the result of my savings, and up to the present always do my own, the method being very simple.

I will now proceed to give any one interested the plan or method I adopt. I have three large paraffin barrels, holding eighty or ninety gallons each: No. 1 for silver washings, No. 2 for gold toning baths, and No. 3 for hypo solutions. In No. 1 I have always plenty of salt or chlorine; in No. 2 also salt and protosulphate of iron; and in No. 3, salt, hydrochloric acid, and liver of sulphur. When the barrels are nearly full I stir them well, and the sediment sinks to the bottom. I continue to do this month after month; I may say, sometimes for two or three years; after precipitating thoroughly, drawing off the clear by means of a spill at or near the bottom of the large barrels, and when I wish to run down I collect the precipitates at the bottoms, each separately. I then proceed to burn the paper clippings, filter papers, &c., in a large iron nail-can punched with holes, taking great care of the ashes. This should be done out of doors on a very quiet day, with no wind blowing. Then I take the red-hot ashes and mix them with the mud I may call of No. 1 barrel, mixing together. I then send it to a baker's oven in a bucket, and, remaining in a hot oven all night, I send for it, and it is perfectly dry. No. 2 barrel, also No. 3, I save by itself, but frequently I have, after being all dry, mixed the lot together, sometimes having an much as ten and twelve pounds of residues. I then proceed and takd equal quantities thus: five or six pounds of borax, same of commoes carbonate of soda, mix altogether, go to the nearest smelting works, anh run it down in their large crucibles they run their brass castings down in. After being in the furnace for an hour, and all is run down, they will pour it, the whole flux and all, into a mould, and your result is in the bottom. The last I did was at Mr. Simpson's Engineering Works, and the result was thirty-two ounces of silver and gold combined. I sent it to Johnson & Matthey, London, and the result was I got 6*s.* 3*d.* per ounce for it after them making an assay, so that the method is very simple.

The gold solutions, precipitated with the salt and protosulphate of iron, which throws down a black powder called peroxide of iron, is much more satisfactory to run down in any ordinary fireplace with a good draught, with a good strong coke fire, melting in plumbago pots or crucibles well daubed inside with black lead. The flux used is the same, borax and carbonate of soda. After being in a good heat for an hour, take out by means of a pair of tongs, and let stand. When cold break the pot, and you will find your little nuggets or buttons of gold or silver, as the case may be. Should this little article be of any use, you are quite welcome. I may say that the late Mr. Johnson (he was such a nice gentleman) gave me some very valuable hints in practical chemistry, which I have found invaluable.—I am, yours, &c., J. Small.

Dartmouth, June 23, 1894.

A CALL TO ARMS.

To the Editor.

Sir,—I think it is high time for professional photographers to combine in some way or another to bring dry-plate manufacturers to their senses, especially those who are so fond of promoting amateur competitions. Whom have the manufacturers to thank for the position they hold, with

their large works, enormous staffs, &c.? Certainly not the amateur. Do dry-plate manufacturers think for a moment that professional photographers are entirely devoid of common sense, and are going to let them "rule the roost" with impunity? I for one think not. No one can stop them offering their 50*l.* amateur competitions, but let the professional photographers throughout the land combine, show a little pluck, and entirely boycott such firms as these, boycott them with such a firmness that their returns will show such a decrease that will astonish them.

I think (I am open to correction) that the firm of Messrs. Samuel Fry & Co., Kingston-on-Thames, were one of the first to start these amateur competitions. I simply ask, Where is that firm now? echo answers, Where? Let other manufacturers be wise in time, and avoid a similar fate.

Sir, you would hardly credit that a friend of mine, a professional photographer who does a splendid business, buys his plates from the local chemist, and gets twelve and a half discount, and all he can get from the manufacturers (a London firm) is ten per cent, and yet this firm supplies the chemist and allows twenty-five and a half off. Surely it's time something was done; let the eight hundred professional photographers who have joined the Copyright Union move in the matter. Civil servants have a store of their own, why not professional photographers? Doctors, lawyers, and nearly every trade and profession combine to protect their interest, why not professional photographers do the same?

The present bad state of the photographic business demands that these amateur competitions, promoted by manufacturers for their own selfish (£ *s. d.*) ends, should have the serious attention of every professional, be he employer or employee.—I am, yours, &c., RUDDER GRANGE.

June 26, 1894.

EXHIBITION AT FOLKESTONE.

To the EDITOR.

SIR,—Will you kindly permit me to state that I am arranging an Amateur Photographic Exhibition to take place at our Folkestone Town Hall, on August 15 and 16. May I add how pleased we shall be to hear from amateur photographers, visitors to Folkestone as well as residents, who may be willing to exhibit, if they will kindly write to me.—I am, yours, &c., EDWARD HUSBAND,

43 *Dover-road, Folkestone.* *Incumbent of St. Michael's.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

RECEIVED.—*Practical Photo-Micrography*, by Andrew Pringle.

T. STOKOE.—Thanks.

OTTO SCHÖLZIG.—Received.

H. W. BENNETT.—Received; thanks. In our next.

C. C.—The bevelled opaline glasses may be had from any of the photographic warehouses.

O. B. (Burton-on-Trent).—Yes, if all the soluble salts are removed in the time. If not, longer washing will be necessary.

OTHELLO.—In a refractor the image is formed by a lens; that in a reflector is formed by reflection from a concave polished surface.

T. J. SNOWDON.—Try some of the special colours sold for spotting, or add more white of egg to the colours you now use, so as to increase the gloss.

E. C. HILL.—The markings appear as if caused by abrasion of the surfaces of the plates before exposure; were they produced in development, they would assume more regular shapes.

F. POLLENTINE.—Various photo-mechanical processes are described in the ALMANAC for 1893. You might also get Burton's *Printing Processes* (Marion & Co.), or Wilkinson's book.

C. POLSON.—1. Powder the sulphate, and expose it to the air until it is sufficiently oxidised for your purpose. 2. To form iodide of silver in such processes as it may be required.

C. STAINER.—It is no fault of the paper, as a gelatine paper, that it cannot be blotted off and dried before the fire, like prints on albumen paper. A surface of gelatine is quite a different thing from one of insoluble albumen, which has no adhesive properties.

C. A. M.—1. Better write Messrs. Mawson & Swan. So far as we know, the firm has not adopted the Hurter & Driffield system of speed determination, hence the data you require are not available. 2. We believe, but are not sure, that the rapidities are about equal. 3. We should say a tenth of a second, approximately.

O. O. (Heywood).—We can only repeat our previous answer. As we know nothing of the medium, its composition, or, indeed, anything of its advantages, beyond what you say, we can offer no opinion as to whether it is worth a patent. Of that you ought to be best judge. In the two prints sent we can see no actual difference, except that one is lighter than the other.

F. H. T.—Cyanine is not kept by druggists; hence, the difficulty. It may, however, be obtained from any operative chemists, such, for example, as Hopkin & Williams. It is by no means a cheap material. Its price per pound you can ascertain on application. Some rough idea may, however, be formed from calculation. The present price is about five shillings per drachm.

T. R. JEAYES.—The recent warm weather possibly has had something to do with the trouble, though, with the plates in question, we should not have thought it had been hot enough to cause the "blistering directly they are put into the hypo." After the negatives are developed, put them in a saturated solution of alum, and then wash well before putting them in the fixing solution.

P. GORDON.—If the ink rollers are in the hard state you describe, and doubtless they are after being out of use for so many years, the best way will be to have them re-covered. That you can get done at any of the dealers in lithographers' material. Before doing so, however, you might show them to a practical lithographer and ask his opinion, as an old roller, if in good condition, is better for working than a new one.

W. BEST.—Your strictures are unfair and uncalled for. It must not be assumed, because a novice does not succeed with his first dozen—or indeed hundred—attempts at photogravure that what has been written and published on the subject is for the purpose of misleading. As a matter of business, the commercial workers of this process on the Continent do not publish the detail of their methods of working; indeed, they keep them as strict "trade secrets." So, indeed, do most successful workers in this country.

T. ROBERTS.—It *is* customary, from what we learn, although altogether wrong, for operators or assistants to make prints from negatives belonging to their employers without the said employers' knowledge, even when the assistants use their own paper and chemicals. Much may be said on behalf of the operator doing so, especially if he be the technical author, so to speak, of the negative; but the least he should do is to signify a desire to retain a copy of any such work for himself under such conditions as the employer chooses to dictate.

F. L.—You are entirely in the wrong. You had no right to use your employer's negatives for purposes of your own without his permission, even if you did purchase your own materials to use with them. When the solicitor applied for their return, they should have been given up and an apology tendered, and not destroyed, except perhaps in his presence. With regard to the salary, that must be a question for the County Court, when probably the subject of the use without permission of the negatives will be dealt with as a counter claim. Possibly, had permission been asked for a few prints as specimens, it would have been accorded, as is usual when an assistant relinquishes an engagement.

HERBERT T. LAWSON.—1. The character of the print is not entirely dependent upon the actual amount of silver in the paper. Two papers may contain exactly the same amount of silver per sheet, and yet give prints of quite an opposite character. As manufacturers do not give the methods by which they prepare their papers, we cannot say the reason of the difference in the behaviour of the two named. In "suiting processes to negatives," differences in the peculiarities of various makes of papers should be also considered. 2. It is quite against our rules to recommend the goods of any manufacturer. Consult our advertisement columns, and get small samples from different makers, and see which suits your method of working the best.

G. HASTINGS writes as follows: "1. If you could give me any information about the following, it would oblige. I have a negative that was reduced locally several years ago with ferridcyanide of potassium and hypo, but, on examining it the other day, I found that, where it has been reduced, it has left a deep yellow stain, unremovable with alum and acid, making the printing quality much worse than it was originally. I enclose a print as it is now. Can you inform me of any substance that will remove it, or how to prevent its re-occurrence? Would making a transparency on an isochromatic plate show the stains, and would it be advisable to expose by a yellow light? The negative was varnished. 2. What is the proper chemical to throw down the valuable metals in old toning baths, and silver washings from albumen papers? is hydrochloric acid enough, or will it leave the gold in solution? 3. I see in your 'Answers to Correspondents' (re Hugh Homfray) that a combined toning and fixing bath is not as permanent as the sulphocyanide one. Does that apply to all combined baths? 4. What is the correct strength of the stock solution of silver nitrate for strengthening the sensitising bath? I use sixty grains to the ounce for use."—1. The best way will be to reproduce the negative, using for the transparency a plate sensitised for the yellow rays with eosine. 2. Hydrochloric acid will do for the washings of the paper. Sulphate of iron should be used for the old toning baths. 3. Yes, to all, more or less. 4. Quite immaterial, so long as the quantity of silver added makes the bath up to the proper strength.

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PHOTOGRAPHING WITH A DEFINITE PURPOSE.

ANY of the pictures for which medals are awarded by certain ittle Pedlington Societies are only flukes, nothing more. A retty bit is discovered accidentally or from information re-ived; a button-presser lies in wait for hours, perhaps day fter day, until light and serenity of atmosphere suit, bags it, rints it, hawks it round the now innumerable exhibitions at hich medals are awarded, and gets one from each.

Some five-and-thirty years ago this kind of thing was ttempted to be satirised by a writer in this JOURNAL, who, nder the heading of "Who Should get the Medal?" described n what way a friend of his who knew nothing about photo-raphy contrived to get the medal of the Formosa or some ther photographic society. He overheard some artists speak f the lovely view of a certain subject that could be had at a ertain hour of the day from a certain spot. He borrowed a amera that required no focussing, purchased a packet of ensitive plates, exposed as per instructions on the packet, got ne expert to develop, a second to print and frame the result, ent it to the Exhibition, and obtained the medal.

This, of course, was a satire; but, seriously, does it not xist, in some little degree at any rate, at the present day?

It is probably only a phase of human nature that, when one ees a view that he greatly admires, he will, if it be in his ower, show his appreciation by imitating it as closely as ossible. We know of some photographers who have, picture n hand, gone to certain scenes and planted their cameras in s nearly as possible the same spots as those from which the oveted pictorial objects were taken. There is no name for his but pictorial plagiarism; it is just one grade higher than opying the picture direct.

As regards the application of the medal system by societies or pictures taken on the occasion of any special outing, there s often apparent a lack of originality in selecting points of iew each for himself, and a tendency to imitation in this espect. The man who is renowned for his skill in the election of tit-bits has his footsteps dogged, as it were, by thers less able to discriminate between the artistic and nartistic, and who will make an endeavour to plant their ameras alongside of his. By indulging in this slavish imita-tion, young photographers will never become artists. Origin-ality in selection and composition would be better fostered if, at the commencement of a session, any easily accessible locality were fixed upon which members might visit at any time con-venient to each one, and a prize awarded for the best result. Taste in selection of subject and lighting would thus be engen-dered, and each would learn in what respect his own work differed from, or fell short of, that of his fellows.

But a far better plan would be found in the adoption of some such system as at one time prevailed in the original South London Photographic Society, long since defunct. A series of topics for photographic illustration and friendly com-petition was given out, which each member was at liberty to treat how, when, and where he pleased. If we mistake not, this suggestion was an outcome of the practice adopted by some sketching clubs. This stimulates originality, and has been the means of several excellent pictures having been produced, all with a purpose and definite end in view.

To show what we mean, we subjoin the list of topics once given out by the Society named for pictorial treatment during one year. There were ten figure and ten landscape subjects. The former comprised—The Shepherd; Afflicted; Happiness; Unearthing a Treasure; Indecision; Mother and Child; Wrath; Rustic; Gone; Age and Youth. The landscape subjects were—A Shady Nook; A Country View, including Church with Ivy; A Study of Leaves; Clouds and Trees; A River Scene; Hay-making; The Harvest Field; A Roadside Inn; Summer; A Village.

In the list here given it will be seen that there is ample room for the exercise of imagination, more especially in the first series, or subjects demanding figures that portray emotions As regards the judging of the pictures thus obtained, this was done by the members themselves, who operated by ballot, and therefore there was no room for jealousies or dissatisfaction at the result. So far from members and rival competitors be-grudging the merit considered due to some particular pictures, we have known awards being made by nine-tenths of those present. The subjects were selected and sent out early in the year, and the awards were not made till the December meeting of the Society, so that ample time was thus afforded for members to seek or create opportunities for the exercise of their pictorial skill. And just think of the variety of render-ings to which any one of the subjects might be made amenable! For example, "Indecision" is capable of being rendered in twenty distinct ways, each one totally different from its fellow.

Well would it be for the art if some such educational pro-ject as that which we have here outlined were adopted by societies nowadays.

ESTIMATING THE SILVER IN RESIDUES.

In a previous article on the subject of residues, and the returns made for them by refiners (see page 386, *ante*), it was mentioned that it is an easy thing for any one to estimate exactly their value before they are sent away to be reduced. If that were always done, the owner would then be in a position to form an opinion as to whether the returns made were as they should be or not. This has not been the case in a single instance in the numerous complaints that have recently been made. Data, such as so many pounds of paper ashes, the washings and fixings from so many sheets of paper and negatives, &c., is no guide whatever.

In the condition that photographic residues are usually dispatched to the refiner for reduction, anything approaching even a rough estimate of the proportion of metal they contain cannot possibly be formed, and an unscrupulous refiner would recognise that directly he saw them. If a little more time was expended in preparing them for the refiner to deal with, it would amply repay for the trouble, and would often save expense in the reduction. This is what should always be done.

In the first place, the chloride from the washing waters and the sulphide from the fixing solutions should be thoroughly dried, which can be quickly done in the kitchen oven. The paper should be burnt, but more completely than is generally done. It should first be burnt in an open grate, the ashes then collected and put into an iron pot, or a clay crucible, which should then be kept in a good fire for two or three hours. The ashes will then incinerate into a fine greyish-brown powder. When the chlorides and sulphides are perfectly dry, they should be rubbed into a fine powder in a mortar, and mixed with the ashes from the paper. There is no advantage whatever in keeping the different residues separate, unless, indeed, they are in very large quantities; then there may be a little, perhaps. After the residues are mixed, they should be passed through a coarse sieve. A piece of perforated zinc, bent up round the edges, answers the purpose well. By this treatment the thousand-and-one extraneous matters that somehow find their way into photographic wastes are separated, and the mass becomes intimately mixed. When the residue is in this state, a correct assay can be made, and any unscrupulous refiner would recognise the fact at once that one may have been made.

We will now suppose the photographer desires to ascertain the amount of silver in the residue. This can be done by reducing some of it on a small scale. If he is familiar with blowpipe operations, all that has to be done is to weigh out, say, twenty grains of the powder and mix it with a little carbonate of soda and carbonate of potash, and submit it, on a piece of charcoal, to the reducing flame of the blowpipe for a few minutes, and then weigh the bead of metal obtained. As, however, the majority of photographers are not conversant with the use of the blowpipe in delicate chemical manipulations, we shall now describe a rougher, and what will in their hands prove a more accurate, method, and which involves no very delicate work.

What we require is a small clay crucible and a furnace. The latter, for the present purpose, can be extemporised with any ordinary firegrate by covering up the whole of the stove, so that all the air that goes up the chimney has to pass through the fire from the bottom of the grate; or the domestic kitchener will answer well, without any special adaptation, and it will prove more convenient than the grate, as the heat will be the better under control. We shall suppose that one is available, and this is how to proceed. Assuming that the sifted powder has been intimately mixed—that, of course, is imperative, otherwise the result arrived at will be erroneous—weigh out accurately half an ounce of the powder and mix with it, with a spatula on a piece of paper, 150 grains of carbonate of potash and 200 grains of carbonate of soda, and put the mixture into a small clay crucible—a "No. 3 skittle pot" will be a convenient one for the novice to use. The paper on which the mixture was made should be crumpled up and also put into the crucible. It is then ready for the fire, which should be a coke one.

The fire should be allowed to fall low, then the bottom of the grate should be freed from ashes. This done, the grate must be filled up with pieces of coke about the size of small hen's eggs, the crucible being placed in the middle. By this means, as the fire burns up, it will be heated gradually, and risk of its cracking avoided. Furnace coke is the best kind to use, but common gas coke will answer with our small crucible. It will, however, be well to select the heaviest and most solid lumps. As the heat increases, the contents of the pot will liquefy, and afterwards boil. As the boiling proceeds, the pot must be watched, and, if there seems a prospect of its boiling over, the heat must be checked by partially closing the dampers of the kitchener. The boiling should be continued—the fuel being added to if necessary—until it ceases, and the liquid remains quiet, or with an apparent rotary motion, at the bottom of the pot, even when the heat is increased. The pot may now be removed from the fire to the hob with a pair of tongs, and allowed to cool. When cold, the pot is broken, and the button of silver, which will be found at the bottom, weighed, and from its weight the quantity of metal in the bulk is arrived at. Supposing, for example, that the half-ounce yielded, say, one hundred grains of metal, then each pound of the residue would contain 3200 grains of silver. It must be kept in mind, in estimating the weight of metal recoverable, that metallic silver is dealt with by troy weight—480 grains to the ounce, or $42\frac{1}{2}$ grains more than in the avoirdupois ounce.

When the crucible is broken, the metal should be found as a clean, smooth button. If it is rough, dirty, and uneven, the reduction is incomplete—either the heat was not sufficient, or it was not continued long enough. There are other ways of assaying the wastes, but space will not permit of their being dealt with in the present article.

AFTER-TREATMENT OF DEVELOPED POSITIVES.

It has been mentioned in the course of two articles on *The Development of Positives on Opal*, how important is the accurate exposure of the plates in order to secure correct gradation in the print; but, even when the exposure may have been right, it is possible that an error of judgment in developing, may spoil an otherwise good picture. This statement applies equally to developed positives of every kind, for the illumination of the developing room is not such as to enable the truest estimate to be made of the appearance of a picture when seen in daylight.

With experience it is, of course, possible to avoid any trouble in this direction, and the man who is working daily at the development of bromide prints, opals, or any such work, has little excuse for not turning out good and uniform results from negatives of normal character; but even the practised hand may

occasionally fail in exactly hitting the very best exposure with a negative that may be widely removed from the category of "normal," and may produce a result that, while not by any means perfect, may, by after-treatment, be made passable.

Of course, it must be understood that, in the case of either under-exposure or under-development, little or nothing can be done afterwards, except with the pencil; but experience shows that the tendency to error in the production of developed positives is greatly in the direction of over-development, and to a less degree of over rather than under-exposure. The majority of faulty positives may, in fact, be considered as amenable to subsequent treatment.

It is scarcely needful to make any distinction in the remarks we have to make between pictures on paper and those on opal, since the method of treatment is similar in both cases, and any difference in manipulation is only such as occurs in the ordinary treatment of the two classes of picture. But this we may say, in the way of warning, that perhaps, of the two supports, opal is the more dangerous, and difficult to keep free from stains under some of the methods of chemical treatment that may be adopted.

For the reduction of over-printed or over-developed bromide prints several methods of treatment have been recommended, one of the favourites being that known as Farmer's, consisting of a mixture of hypo and ferrrid-cyanide of potassium in very weak solution. In the case of fully exposed positives, in which there is plenty of detail in the higher lights this plan answers well, at least with paper positives, and has very little of an injurious effect on the tone of the picture. But for lightening heavy shadows where there is a tendency to lack of detail—where, in fact, the fault is under-exposure—it is of no use, as it attacks the finer details first and makes the final result worse than the original. Besides which, the readiness with which this mixed solution produces an indelible yellow stain especially upon opal, places it altogether beyond the bounds of safety for the purpose under discussion.

The better plan is to treat the proof with one or other of the numerous agents employed or employable for the conversion of the silver image into one of the haloids. Of these, iodine, bromine, or chlorine in aqueous solution are the most obvious examples, but in practice some of their compounds are found to be more convenient, as, for instance, some of the haloid salts of the dead metals which are capable of acting upon metallic silver. Of these, cupric chloride and bromide, ferric and mercuric chloride are equally available, though we are inclined to give the preference decidedly to the copper salts. A mixture of bichromate of potassium, with a soluble chloride or bromide, forms also an excellent bleaching agent, although with opals it is liable to produce a permanent yellow stain, from the avidity with which the surface of the matt opal absorbs and retains anything in the nature of a colouring matter. For the same reason, when the cupric or mercuric salts are used, very thorough washing is required after every operation, otherwise stains and uneven action will inevitably result.

For general purposes, and considering all points, we are inclined to give preference to cupric chloride as the bleaching agent, and, if it cannot be readily obtained, its solution may be made by dissolving equal quantities of sulphate of copper and common salt in water. The strength is not very material, though the solution should not be too strong, especially in the first of the methods of procedure we shall describe. It may be well to make a strong stock solution by dissolving, say, 100 grains of each salt in hot water, and keep this for use, diluting it as required.

To treat a positive that is only slightly over-printed, immerse it in very weak solution of the bleaching agent until the desired result is judged to have been attained. This can only be safely arrived at after some experience; but, when a chloride is employed as the bleaching agent, the effect produced by the bleaching is very similar to what it will be after the subsequent treatment, which consists in simply passing the proof through a bath of clean hypo and washing thoroughly afterwards.

If the result be not sufficient, the process can be repeated, but, if it be overdone, there is no redress. Hence we prefer a modification of the system which allows any result desired to be attained with ease. Using a stronger bleaching solution allow it to act to its utmost; in fact, completely convert the image into chloride of silver, or bromide, as the case may be. Then, after a thorough washing, proceed to redevelop with hydroquinone, amidol, metol, or any suitable developer, in full daylight, when it will be quite easy to stop the action at any desired stage. Then fix as usual.

This plan has the very great advantage that, it preserves the most delicate details of the lights of the picture, while overheavy shadows may be reduced. In fact, in the redevelopment, the finer details are fully reproduced long before the shadows have gained their full strength, and these can be stopped at any moment.

This process is a thoroughly practical one, and has been used for some years, the only care necessary being to observe a due amount of washing between the different operations.

New Use for Bichromated Gelatine.—M. Izaru presented a note to the Paris Academy of Sciences recommending the use of bichromated gelatine for the protection of silver surfaces on scientific instruments, such as, for example, the backs of mirrors formed of silver.

Tannic and Gallic Acids.—Time was when these substances were found in almost every photographic dark room, but the march of improvement has relegated them to the back shelves. It will, however, be worth while to note a new and simple mode of discriminating one from the other, given in a late number of the *English Mechanic*, over the signature of Frederic Davies. He writes, that if a solution of potash and of chloride of barium be prepared, and a solution of tannic acid added, the result will be a pink precipitate gradually darkening, but that, if gallic acid be added, a blue precipitate will be produced.

Phosphorescence and Fluorescence.—A paper bearing upon this subject was read at a meeting of the Chemical Society by Mr. Herbert Jackson. He concluded that phosphorescence in air and in a vacuum were closely connected phenomena, and Professor Dewar, in the discussion following, stated that he had recently been making a series of experiments on photographic action and phosphorescence at temperatures of about two hundred degrees below zero. Under such conditions nearly all substances showed phosphorescence, and some, such as cotton-wool, paraffin, &c., remarkably brilliantly. Some substances that at ordinary temperatures were only said to be fluorescent became phosphorescent.

Fog Prognostications.—As no photograph of an ordinary kind is of any use with a foggy atmosphere, it will be of undoubted use to be able to know whether, on a projected day's outing, there is a probability of the fog-fiend making his appearance or not. At a

meeting of the Royal Meteorological Society in the latter part of last month Mr. R. H. Scott, reading a paper on the subject, stated that, out of a total of 135 fogs, 108 were associated with cyclonic, and only twenty-seven with anti-cyclonic, conditions. As the daily weather reports always give particulars regarding these conditions, it is evident that, whenever it gives an anti-cyclone as prevailing, the probabilities are all in favour of freedom from this objectionable condition.

The Use of Permanganate to Test the Purity of Water.—Probably the rough-and-ready test of using this chemical to ascertain whether water contains organic matter or not is the most common of any, although under ordinary conditions its indications are most fallacious. Signor P. E. Alessandri, however, suggests the simple plan of boiling the water for some time with dilute sulphuric acid, and then adding the permanganate. He recommends it for a quantitative determination of the organic matter present, one part of permanganate decolourised he estimates to represent five times the weight of organic matter present; of course, the salt is kept in solution of known strength, when an easy calculation will give the amount of organic impurity the water contains.

Astronomers and the American Public.—The great Lick Telescope is a perennial subject of wonderment and interest to the public at large, but it is somewhat surprising to learn that on the free days the Observatory is liable to be actually thronged with visitors. Such, however, according to an article by Mr. Barnard in *Astronomy and Astro-physics*, was the case on a recent occasion. The crowd were all the more in the way, seeing that a clear night, which had been hoped for for some time past, happened on a particular Saturday night when the crowd was there. However, upon the visitors' permission being asked by the authorities, and courteously granted, the twelve-inch instrument was set to search for Gale's comet, which was quickly found, and a photograph taken with a six-inch portrait lens.

Electric *versus* Gas Light.—Electricity is now playing such an important part in photographic portraiture that the remarks of the President, at the recent meeting of the Incorporated Gas Institute, will be valuable to those who wish to have further information as to cost. He said that, if some of the public like to pay for electric light as a luxury, there was no doubt that installations within reasonable areas, with gas engines as a motive power, would be found most reliable and economical, and, from a sanitary point of view, far better than the large number of steam boilers that were being put in our midst for the purpose. It was now a well-known fact that a gas main would deliver us sufficient gas to generate 5000 horse power—or as much more as they pleased—at a long distance, say, three or four miles, at from three to four times less than the same power could be transmitted by electric cables. Under the best conditions, he said, the electricians put down the fuel as at two and a half pounds per Board of Trade unit; but that, if the accounts of the electric light departments were examined, it would show rather a consumption of twelve pounds per unit. It may be noted, in this connexion, that the Glasgow authorities have been going into the matter of relative cost, and the committee appointed to examine the question have reported that they "do not feel warranted in recommending that the scheme be gone on with, the cost being so much greater than the present gas system." They advised, as an experiment, the trial of a dozen incandescent gas lights in St. Vincent-street.

SELF-TONING PAPER.

One of the latest novelties in the photographic market is a so-called "self-toning" printing paper, which possesses certain properties that will recommend it for some kinds of work, although, perhaps strictly speaking, it is far from being the new thing it may appear to many. As announced by the manufacturer, M. P. Mercier, it is prepared with nitrate of uranium, and that fact naturally carries us back to the once famous Wothlytype process, which was heralded with such a flourish of trumpets thirty years ago, but entirely failed to catch on with the public.

With the causes of that failure we have little to do at the present time, but they were perhaps entirely outside the process itself, which was undoubtedly capable of producing most pleasing and artistic results, and, as far as permanence is concerned, was, no doubt, equal, if not superior, to albumen paper under ordinary treatment, for only a few months ago I came across one of the early specimens, issued by the United Association of Photography, that was apparently as fresh as when first sent out nearly thirty years ago.

In Herr Wothly's process collodion was saturated with nitrate of silver and nitrate of uranium, and this solution—not emulsion—was spread upon properly sized paper, dried, and rolled. It printed rapidly, giving a fine and delicate image, which was toned in any of the ordinary toning baths, but preferably in one containing sulphocyanide. Considerable controversy arose at the time as to the novelty of the process, the value of the patent, and other details; for the use of nitrate of uranium in conjunction with silver for printing purposes had been "exploited" by Burnett and others nearly ten years earlier, and the reintroduction only set experimentalists to work again at a process that seemed to offer such excellent results.

Amongst the peculiarities noticeable in connexion with the silver-uranium image was the alteration of colour produced by heat, both before and after toning with gold, but most particularly before. If the print, when taken from the printing frame, was washed and fixed without any further treatment in the way of toning, an image varying from a yellow to reddish brown was the result, and the effort anything but either pleasing or artistic; but, if the print, after drying, were held in close proximity to a hot fire, or a hot iron were passed over it, the colour was at once much darkened, and the unpleasant yellow or red tint removed, the final tone varying from chocolate-brown to sepia, and nearly approaching black in the heaviest shadows. But the tone so produced was dependent entirely upon the print being kept in a state of perfect dryness, for, if it were wetted, it at once returned to its original colour, or nearly so; the act of drying and heating appeared to effect some little permanent change, though not a great deal. The mere absorption of moisture from the atmosphere sufficed to appreciably lighten the tone of the print when freshly ironed or heated, but the change in this case was not sufficient to detract from the character of the picture. The gold-toned image was similarly affected by heat, although not to the same degree, the further the toning was carried the less marked being the change.

It is this property of the uranium image that is utilised in the so-called self-toning paper of M. Mercier, which behaves, in a general way, precisely as the old Wothlytype, although the method of preparation is probably entirely different. The new paper has a smooth matt appearance, similar to the finer gelatine papers, and entirely free from the slightest symptom of gloss, such as would be produced by even the thinnest collodion film; in fact, all the indications point to the paper being sensitised by floating, rather than by coating with an emulsion or other sensitive preparation. So far as I can ascertain by a rough examination, the paper contains but a very minute quantity of soluble silver salt, and apparently less of uranium; yet it prints with great rapidity and, with a suitable negative, gives an image of great vigour and beauty.

The colour of the image when it leaves the printing frame is a rich purple, varying from brown to black, according to the depth to which it has been carried and the density of the negative. To produce the best results, the negative requires to be of the vigorous kind, such as would answer best with albumen paper, rather than the thinner and more delicate ones that suit gelatino-chloride. With the latter it is impossible to obtain rich tones, as the printing cannot be carried to a sufficient depth. Except with very dense negatives, it is desirable that the printing be carried out in a weak diffused light.

To utilise the self-toning properties of the paper, the print, on removal from the printing frame, is immersed directly, without preliminary washing, in a solution of hypo of the usual strength, our

better still, in a mixed solution of hypo and sodium sulphite. In this solution it acquires a yellowish brown tone, similar to that produced under similar circumstances with albumen or gelatino-chloride paper, and is thoroughly fixed in five or six minutes, when the print becomes almost transparent, the image being clearly visible from the back. At this stage the colour of the picture is far from pleasing; but, if it be well washed and allowed to dry, it becomes more satisfactory, although even then it is not of such a character as to please most tastes. If, however, it be now held to the fire, or a very hot iron be passed over it, a remarkable change occurs, and the colour becomes a rich purple brown, varying with the depth of printing, the character of the negative, and the degree of heat employed. The general effect is, in fact, very pleasing, and the result, especially for large pictures, most artistic.

As to the permanence of the tone, as I have already said it depends upon the state of dryness of the print, though, under ordinary circumstances, I do not think it would vary much. Of course it must be expected to change a little, or go back, immediately after treating; but, after absorbing its normal proportion of moisture from the atmosphere, I do not think it is subject to any further change unless under very extraordinary circumstances of dampness, and even then redrying will restore the colour. Still one cannot be constantly going over one's pictures with a hot iron to keep them in colour.

If preferred, however, the prints may be toned with gold, and here the elasticity of the paper is remarkable, for the toning may be performed either before or after fixing, and with almost any kind of bath, though the sulphocyanide bath appears to answer best. A very weak, or almost spent solution suits the paper better than a stronger one, and produces tones varying from brown to purple or black.

W. B. Bolton.

ON THINGS IN GENERAL.

His Honour, Judge Price, Q.C., has given a ruling which, if upheld, will be one of very considerable value to those professional photographers who, from one cause or another, do not, or are not able, to obtain prepayment for their work. It was the old story. The lady and her sister were photographed, and in her pony carriage, too—not as other meaner folk—and, of course, the photographer had to attend at her residence. Naturally she could not be made to look so nice taken in the open air as in a studio, and she objected to the results. The obliging artist went on altering and printing fresh proofs, but all to no end; the lady was obdurate, and she, or her husband, objected to pay. The truth is the photographer, for merely going down to the house and taking a negative of a lady in a pony trap, and then two ladies in a pony trap, and sending several proofs, had the audacity to charge a whole pound! Why, if the man had been a footman applying for a place, he would scarcely have asked a higher rate of pay, but "some people are so very expecting." I think the Judge's ruling deserves quoting; he expressed his strong opinion that there was no reasonable defence to the action—or, at any rate, one which he felt inclined to entertain. The defendant had made no express contract that, unless the photographs produced were to his satisfaction, he should not pay for them, and now objected as a mere matter of caprice. That defence could not be upheld. Further, he said his decided opinion was, that the defendant having selected his photographer, and that photographer having done his best, without guaranteeing any certain result, the defendant must pay for the work he had done, the charges made for which were not disputed as unreasonable. In fact, his view of the matter was, that the defendant must take his photograph as he took his wife, "for better or worse." I wonder how many unfortunate professionals will cut this paragraph out of the Journal and hang it, framed, in their studios?

Mr. Hector Maclean, F.G.S., has called attention in his article, "A Photographic Plague," to a crying evil—the use made by illustrated periodicals of any non-copyright photograph they take a fancy to. In the valuable suggestions made by the Photographers' Copyright Union, they can only suggest a fee being asked for copyright pictures. As a matter of course, there can be no forcing any paper to pay one penny for using a photograph not registered at Stationers' Hall, no more than British authors used to be able to force American reprinters to pay for the book they pirated. The two cases are on a par—legal piracy. Yet there were some honourable men in America who paid English authors whose works they copied; so, in this country, there are publishers equally honourable in regard to photographic productions, but their payments form an insignificant minority compared with the photographs utilised without payment. Is there not a remedy? I think there is! The prudent householder, dreading the burglar's visit, does not label his spoons and forks "silver" or "electro;" he leaves that enterprising individual to take his chance of going home with a bagful of worthless plunder. Why should photographers label any of their work copyright? The law does not require it, and they positively, in so doing, go out of their way to point out to the pirates which of their pictures are safe, and which unsafe, to copy. Let all be treated alike and left unticketed, and the pirates will not dare to copy any, for fear of penalties. To look at the file at Stationers' Hall would be too difficult to be a practical alternative. Photographers, look to this!

One of the pleasures of life is the coming across an old, familiar face, which has been out of sight for a long time; hence my feelings may be imagined when, in reading a paper recently brought before the London and Provincial Photographic Association, I met with my old friend, sulphite of soda, dissolved to the extent of forty per cent. in water. Now, I do think, when men congregate together in all seriousness to compare notes and detail experiences, some care should be exercised in giving trustworthy information. Mr. Ernest Milner gave a formula for developing, containing, in one solution, besides other ingredients; four ounces of sulphite of soda in ten ounces of water. Mr. Milner had better try to compound his "No. 1 solution," as given in this Journal a few weeks ago, and see what proportion of sulphite ten ounces of water cold will hold in solution. I think, too, he is to be congratulated on the possession of a lens of eight and three-quarters inch focus, which is capable of covering so as to illuminate perfectly every corner of a plate twenty-two inches by ten. But this is a "modern lens."

Mr. Fall's remarks at the Hackney Society were very amusing, and I can echo emphatically his remark on the need for tact for professional photographers nowadays. I don't think any one could run a business successfully without being endowed with that particular mental characteristic. His observation on sitters knowing so much about photography reminds me of a curious instance that occurred when I was taking a portrait of a lady amateur. She was a good model, and, finding her in a good pose, and remaining very still, I made an exposure with an interior pneumatic shutter without her being aware of it. She did not move a hair for fourteen seconds, and when I told her I had finished, and she might sit down, she said, "What a wonderful improvement the instantaneous process is!" She was delighted at being taken "so quickly" as to be unaware of what was taking place.

What capital papers we have recently had the advantage of listening to upon the somewhat obscure subject of photo-etching, but, when the instructions are put in print, they sometimes become confusing. For example, I am very much puzzled to know what is meant when I read in the account of Mr. Wilmer's lecture at the Photographic Club, and find that "the temperature of the etching solution was then tested with a Beaumé hydrometer." I have heard of the strength of a solution being tried with a Beaumé hydrometer, but a Beaumé thermometer is a new instrument. However, we live and learn.

Free Lance.

THE APPLICATION OF PHOTOGRAPHY TO AERONAUTICS

Photographs have been repeatedly taken from the car of a balloon of the country beneath, but they have not been satisfactory for sharpness of definition. They might serve for giving an idea of the construction of fortifications or the position of an enemy's forces, but as mere specimens of photography they are not effective. There are several reasons for this. The pictures have usually been taken

near sunset, at times when balloon ascents have been made for public display, then a stratum of mist covers the ground. This is caused either by dust particles or vapour from the land, rendered conspicuous by the obliquity of the sunlight. In order to avoid this, the pictures should be taken at a time when the sun is near the zenith.

Another difficulty arises from the occurrence of a slow rotation of the balloon in a free ascent. This movement quite prevents the possibility of sharp definition of objects near the horizon even with very short exposures. In the year 1867 I proposed to remedy this by carrying in the car a gyroscope, which, being set in rapid rotation, the assistant, by seizing the bearing ends of the horizontal axis of the instrument, could hand the balloon round so as to counteract the tendency to rotate, just as if he were turning the car from a fixed abutment. A small gyroscope would have sufficient power for this purpose. I am not aware that this suggestion has been adopted in practice.

Another signal use of photography is for the delineation of so-termed flying machines in their construction and action. From a very early date we have repeated statements of men with adaptations of wings having performed extended flight, none of which have been satisfactorily authenticated.

In a work just issued on *Progress in Flying Machines*, by O. Chanute, C.E., of Chicago, we have illustrations of flying machines of actual construction copied from photographs, and quite recently the flights of Herr Lilienthal, of Berlin, taken during his transit through the air, showing the form of his wings and his own position in the machine, of which he has complete control, and can always alight with perfect safety.

It may be mentioned that these flights are not performed for exhibition purposes, but are carried on privately. The experiments are skilfully conducted on scientific principles, and are of a tentative and progressive character. Photography cannot deceive us as to pictures of the actual performance of wing flight in air.

F. H. Wenham.

ON THE PRODUCTION OF REVERSED NEGATIVES.

II.

In a former article I referred to what is perhaps the easiest of all methods of producing reversed negatives, viz., the reversing of the sensitive plate in the dark cell, and it is not only when using a dry plate that this method becomes at once convenient, for the system is equally possible in the case of a wet-collodion film; but when it is desired to expose such in the manner indicated a somewhat different method of protecting the film must be resorted to. Still even this is a matter easily accomplished if gone about properly; in practice there are several ways of doing this, but perhaps one of the most certain and simple methods is to cover a glass, the same size as the sensitive plate, with a sheet of black needle paper and to gum, glue, or paste on at its four corners small pieces of cardboard; these will occupy the same position on the sensitive plate as the silver wires in the wet-plate carrier, and when this covered glass is laid face down over the sensitised collodion plate the four portions of cardboard will separate the glass from the sensitive surface of the plate just sufficiently to protect it; the same precautions as to careful focussing must, of course, be observed.

It very frequently happens, however, that reversed negatives are required in cases where only an ordinary negative exists, and there is no other means of dealing with the subject except from such. In this case, when it is decided not to subject the existing negative to the operation of stripping and reversing, two or three courses at least are open to an operation. The first is to make a transparency, by means of an ordinary gelatine bromide plate, by contact with the negative, and, if this method is adopted, a special point in the operation is the necessity for producing a positive of a somewhat totally different character from the ordinary run of transparencies made for lantern purposes. In the work in question what is required is a positive picture, soft in character and full of the most minute detail, it must not be hard or contain violent contrasts of high lights or shadows, otherwise the negative will never be satisfactory. With one soft and full of detail good results will be obtained; when such is produced, much work with the brush and pencil may be still expended upon it to improve its character; this is then placed in the copying box, film side from the lens, and the plate inserted in the dark cell in the usual manner, or, *vice versâ*, the plate may be reversed in the dark cell and the transparency placed film inwardly in the copying box, the utmost care being taken to get an absolutely sharp image in copying through the lens.

There are many workers, however, who have not a copying box. So here is another method of getting as good a result without its aid. From the original negative pull off as perfect a print on the class of paper best suited to the particular negative in question; this may be Aristo or Solio provided the negative is thin in character; if dense, then a matt-surface paper or a good sample of albumenised will answer quite as well; tone and fix in the usual way, and, if a glazed paper has been selected, proceed to mount the print in optical contact on glass by brushing over its surface the mounting medium; nothing is better for the purpose than freshly made thick starch allowed to cool. Next, brush over the surface of the glass that the print has to be mounted on a coating of starch also, lay the print face down on the starched glass; before squeegeeing the print in contact *brush over the back of the print some starch*, this latter will prevent any rupture of the print from the squeegee, because the starch will act as a lubricant. Squeegee into contact, and the job is done as well as if a hot gelatine solution were employed; there is no simpler or better way of mounting prints in optical contact with glass than that just briefly described. If desired, the print may now be placed in position to be copied by the camera, but as a rule it will be found that better results are obtained by allowing the print to dry first, a better colour in the high lights is then apparent.

The plate is then placed in the camera in the reversed manner, and a sufficient exposure given to bring out the finest detail without any forcing in development. If the operation of copying be properly understood, there will be no reflections from the glass surface. Such need never exist under proper conditions of lighting.

Another method largely practised by photo-mechanical workers is the employment of a mirror, whereby the image is reflected through the lens on to the sensitive plate. In well-appointed copying studios, special appliances are fitted up to undertake this branch of the work. A casual worker, however, can get along very well with the common homely article found in most bedrooms, and I have seen reversed negatives produced with this every-day article of furniture that would compare with those produced with the aid of a more elaborately fitted-up set of apparatus. Here is one way for an amateur or casual worker to set about producing a reversed negative by means of a mirror. Supposing it is desired to copy in reverse form any half-plate photograph or other similar picture, let the same be affixed to the sides of a box, at the same height as the centre of the lens when camera and box are placed alongside each other on the table. In front of the camera place the mirror, and then, by slightly moving the box with the picture, and also the camera, the reflected image will easily be brought into position on the focussing screen. This operation is easily conducted in close proximity to any ordinary window.

A somewhat longer exposure may be found necessary when practising this method of reversing, but there are many workers who prefer it beyond all others. The utmost sharpness is obtained by this method, and there is no trouble from reflection. No doubt, most excellent results are secured by this means, and it is of great service in copying operations.

There are other means of placing a picture *in situ* when being copied with the aid of a mirror, but the one I have described is, perhaps, as simple as any. A worker will not be long in finding out for himself the simplest way to set to work once he has made a commencement, for a good deal will depend upon the surroundings and the circumstances attending each particular subject that is being dealt with.

T. N. Armstrong.

A CHAT ABOUT THE EXHIBITIONS.

II.

(A Significant Caution—Once more, "Hands Off!"—Tampered Negatives—A Section for Hybrids.

One innovation in this year's general regulations of the Photographic Society of Great Britain's forthcoming Exhibition, if persisted in, is like to have a very far-reaching effect.

The one referred to actively revives the oft-debated question whether the Society should countenance a mixture of photograph and hand work; whether so-called bastard photography shall merely, on the strength of its winsome looks, be allowed to consort with the

gitimate, if sometimes homely, offspring of chemical and camera?

The rule, or rather caution, in question reads as follows:—

"All working up of photographs by hand, except mere spotting, is undesirable, and may cause the rejection of the exhibit."

This indication of policy is so important that it is quite worth while devoting a few moments in commenting upon the consequences likely to ensue.

And perhaps it will be well, as indicating that I approach the question with a distinct leaning towards "pure photography," to mention that so far back as 1890 I energetically—perchance too much so—protested against the habit of invoking the brush and pencil to fortify the photograph. In an article entitled "Hands Off!" published by a contemporary, I directed attention to several prints, and all by well-known exhibitors (some of them being medalled), which hung at the Pall Mall Exhibition of the then current year, seemed to have received various degrees of adventitious aid, and I most respectfully asked the chief offenders "not to put forward as *pure* photographic productions views or portraits in which effects largely depend on the exhibitor's skill in the graphic art." It is needless to say that for my pains I received more kicks than halfpence. However, I appealed with the glorious confidence of inexperience—of the affairs of the Society—to the Photographic Society of Great Britain "not to allow another Exhibition to be held under its auspices without drawing a hard-and-fast line between what is and what is not unalloyed photography."

The executive of the Society, bearing well in mind "chi va piano va sano, e chi va sano va lontano," have, I suppose been thinking the point over ever since; unless they have rediscovered it for themselves, I will not accuse them (as one of my flagellators did me when I wrote the aforesaid "little article"), of having "pecksniffed" the idea from me or from any one else, for the notion has been floating in the air for many a long year. Anyhow, it is apparent that I am no unsympathetic commentator upon the new move; indeed, warmly welcome the abstract declaration, of which the germ is contained in the above caution, that the Society should, beyond all, concern itself in stimulating and encouraging the production of exhibits which owe their being solely to light acting upon a sensitised medium, supplemented, as needful, by development, toning, and fixing.

But—excuse the dreaded word—is this heroic and correct course of action possible? and, if so, is it expedient?

So far as concerns possibility, the answer may, I think, as regards prints, be affirmative, for such rules might be drafted against print-doctoring as to enable experts to ensure the exclusion of offending exhibits. With negatives the matter is less simple; a "declaration" could be added to the entrance form. But in some cases such an expedient would be worthless; for several reasons, chief of all being that many exhibitors do not read exhibition regulations, but fill up forms without the slightest idea as to what they are thereby pledging themselves to.

To be sure, while the giving of medals holds good, it could always be made a condition that no award shall be "made absolute" until the original negative be submitted to the Judges. But it is doubtful whether the executive are as yet disposed to go in for such a draconic stipulation, and therefore no more need be said on the subject. Except, by the way, I should like to interpolate my opinion of its being merely a very convenient quibble to maintain, as many do, that while working up of the print is "horribly improper," it is supremely honest to fake the negative as much as you please, and that the offspring of such a hybrid may be rightfully called a pure photograph. Once admit this rotten doctrine, and "one is unable to determine what particular position in space it is he occupies"—pardon the paraphrase.

You work up your negative; make an enlargement, work that up; from this you obtain an "improved negative," work that up also then proceed to print off a real unsophisticated image of Nature taken by the instrument which cannot lie, even when shown how.

Coming to the consideration of expediency, this resolves itself mainly into whether the Society is strong enough to stand the purging which would be needful, for it would come exceedingly hard upon quite a large proportion of the Society's most devoted and reliable supporters if the word went forth that no "assisted" prints may hope for mercy. Off-hand, I should think that somewhere near about fifty per cent. of the exhibits hung at the Pall Mall Exhibition during the past ten years have received more help than "mere spotting." Having for so long accustomed photographers to indulge in the habit, it would be cruel indeed to make them suddenly give it up.

Another aspect is, What would be the effect produced upon the indiscriminating but exacting public which has for so many years been unwittingly gazing at poetry and mistaking it for prose? It is pretty certain that the greater world has become so used to enjoying photographic *ragoût* that it will of a surety at first revolt against plain roast or boiled as being far too insipid.

And so there must, it seems, needs be some compromise, a period of transition, which I hope may be free from relapse. The Photographic Society of Great Britain, clearly recognising that its mission is the encouragement of photography, might, I should think, while distinctly refusing to honour or exhibit *as such* photographs which have been in the slightest degree tampered with, either in positive or negative, very well institute a class for the application of photography to various decorative purposes. Already photographic reproductions of artistic handiwork, by means of photogravure, collotype, &c., have received recognition and a definite position in the Exhibition. Might not the productions of those who claim that the expression of fine art mainly by means of the camera is *un fait accompli* be grouped with the above, and the whole merged into an art section?

What with paintings being founded upon photographs and photographs in their various stages being brushed and pencilled, there are, in many instances—not the majority, however—but few generic differences remaining between the two resulting pictures. In one case the mind uses a machine, in the other the machine uses a mind. Some such an arrangement, if even only resorted to as a temporary measure, would surely gratify the photographic practitioner who so cleverly, and at times so gracefully, conjures automatic records into visions of artistic personality, for it would tacitly acknowledge the right which he claims for his work to be considered akin to the etching, sepia drawing, or engraving. The professional portraitist would also accord approval, for he feels that, until Science lends him yet a little more of her aid, he cannot hope to do himself what he and his patrons consider justice without the conscious and thoughtful finishing touches of the man endowed with taste and skill. Lastly, the visitors will continue to be both charmed and surprised. They are not quite particular about the means, and will complacently swallow a few drops of paint providing they have a display of profound sensations over which to marvel exceedingly. At present we see "I would waiting upon I dare not." Once let it be known that, in a section apart from all the *pur sang*, hybrids will be gladly welcomed, an immediate impetus will be given to the production of effects which as yet, with few exceptions, are only flavoured with a very weak essence of genius, but which, though they be only *splendide mendax*, once they are accorded a recognised status, will, no doubt, deliver themselves eloquently with novel and captivating arrangements. These may not quite "take the world by storm," but they will, in a large measure, serve to sweeten and dignify the life and labours of the huge army of those who, albeit they work with lens and dry plate, flourish mainly in direct proportion to the refinement and training which their eyes have acquired, and by means of which they are swift to recognise grace of form and harmony of line.

HECTOR MACLEAN, F.G.S.

CURIOUS FORM OF SILVER.

AN interesting modification of metallic silver, the existence of which, although by no means recently discovered, is, nevertheless, left unmentioned in standard works, has been described in the "Proceedings of the Engineers' Society of Western Pennsylvania." It is well known that, when hydrogen gas is passed over silver chloride heated to about 300° Cent., the chlorine is removed from that compound and metallic silver left behind. The metal in this experiment, when examined, is found to consist of a compact rounded mass, resembling in shape the mass of chloride from which it has been produced, somewhat rough and of a moderate degree of lustre. If, however, in this experiment silver chloride be replaced by silver sulphide, heated to a high temperature, it will be noticed that, on passing hydrogen over this latter compound, the black powder gradually changes into a mass of tangled wires or threads, which exhibit the lustre of highly burnished silver. The threads vary in thickness from that of the finest hairs to that of coarse sewing thread, and are so linked and knotted together as to be almost inextricable. Under the microscope it can be seen that some of these wires consist of several threads imperfectly stranded together and present the appearance of a rope whose strands have become partly untwisted. A similar tangled formation is observed when hydrogen is conducted over artificially prepared copper sulphide heated to about 600° Cent., a tangle of copper thread being produced.

The cause of this singular phenomenon is still a matter of conjecture. The fusion point of silver (954° Cent.) is almost 500° higher than the temperature of reduction, so that, although

the appearance of the silver tangle seems to suggest that it has passed through a liquid or plastic condition, yet it does not seem possible for the metal to have actually melted. Neither is it probable that the heat of reduction is able to account for any local rise in temperature, inasmuch as the respective heats of formation of silver sulphide and hydrogen sulphide do not differ very widely. The phenomenon can hardly be ascribed to the quality of ductility which silver possesses in an eminent degree, for there is apparently no force concerned which could cause a drawing out of the metal. For the present, therefore, this must be regarded as one of the many questions in connexion with silver and its compounds on which light will be cast by future research. G. E. Brown.

A NEW FORM OF OBJECT-GLASS MOUNTING.

[Nature.]

Among the numerous details in telescopic construction that have become of greater importance in consequence of the increase in size of refractors may be mentioned that relating to the form of mounting of the object-glass, which plays a leading *rôle* in the good working of a telescope.

The chief difficulty which has to be overcome is the great dearth of substances which have the same coefficient of expansion as glass. For small objectives brass fastenings are used, but for larger discs these have been replaced by the adoption of steel, the coefficient of expansion of which more nearly approaches that of glass. In the latter case, allowances have to be made for the difference of expansions of the two substances (glass and steel), and this is done by breaking the metallic band which encircles the objective, and connecting the two ends thus freed by means of one or more screws. In this way the pressure of the band on the circumference of the discs can be regulated by tightening or slackening the screws, as the case may be, and the inequality of expansion or contraction can thus be counterbalanced.

If only one disc of glass were in question, the problem would be somewhat simple; but, since an objective consists of two discs, and these of different kinds, each possessing its own special coefficient of expansion, the matter is distinctly complicated. With two discs it will be seen at once that the metallic ring may be made fast for one, while the other can be free to move, and therefore quite loose. This naturally raises numerous disturbances in the centering of the lenses.

The functions of a perfect cell are then, firstly, it must be capable of holding the lens firmly and without change of form; while, secondly, it must be so arranged as to allow for the different changes brought about by temperature without disturbing the centering of the lenses.

To produce such a cell as this has been the object of Dr. R. Steinheil's investigations,* and the following summary contains his suggestions. The principle consists in leaving a space between the inside of the cell and the circumference of the two lenses, and placing rigidly between them blocks of particular substances and sizes, such that they compensate for the different expansions at work.

The amount a substance expands or contracts depends not only on its increase or decrease in temperature, but on its length. Thus, for instance, a long rod when heated expands more than a short rod of the same substance. Making use of this fact, we may either assume the *length* of the blocks referred to above, and calculate of what substances it must be composed to give the exact coefficient of expansion required, or we may take any substance with a *known* coefficient of expansion, such as zinc, and determine the length it is required to be. The latter method, of course, by its simplicity commends itself, and, if the length of the block be denoted by l, we have the formula—

$$l = \frac{\phi - \gamma}{\sigma - \phi},$$

which gives l in terms of the coefficient of expansion of (ϕ) the cell material, (γ) the glass, and (σ) the material for the blocks. It will be seen from the formula that the shorter the blocks the more equal must be the coefficients of expansion of the glass and cell material, and also the greater the relative distance between the coefficients of expansion of the blocks and cell material.

Dr. Steinheil, as an example, determines the length of these blocks for an objective of 50 cm. aperture, the lenses being composed of common flint silicate marked O.544 in the Jena glass factory, and common crown silicate marked O.1022.

If the material for the blocks used be of zinc (coefficient of expansion $= \sigma = 0{\cdot}00002918$), then their length, adopting for the flint glass (544) the value $\gamma = 0{\cdot}00000788$, and for the cell material the value $\phi = 0{\cdot}00001061$ for their coefficients of expansion, is given by the equation—

$$l = \frac{1061 - 788}{2918 - 1061} = \frac{273}{1857} = 0{\cdot}147.$$

Similarly for the crown glass, the coefficient for which is 0·00000954, we obtain the length of its blocks—

$$l = 0{\cdot}0576.$$

As the radii of the glass discs are the same and equal to 25 cm., the lengths of the blocks for each of the lenses must be $0{\cdot}147 \times 25$ cm. and $0{\cdot}0576 \times 25$ cm., or 3·675 cm. and 1·44 cm.

Dr. Steinheil proposes that for each lens three blocks should be used and placed at intervals of 120° round the circumference of the discs, the blocks fitting tightly between the discs and the sides of the cell. It might at first be thought that such tight fitting as seems necessary could not be exactly enough done, but it is stated that accuracy in the length of the zinc block to 1 mm. can be safely depended on, and the danger of strain by eliminating the disturbances of centering thereby reduced to a minimum.

That this new mounting for object-glasses has many points in its favour cannot be denied, but it is in such questions as these that we must look to the results after the method has been practically applied. Thus, practice would better settle the proper number of blocks for each lens; three seem at first sight somewhat too few, and might lead to local strains due to the weight of the lenses, whereas such strains must be avoided in any sort of cell. W. J. S. Lockyer.

* See "Ueber eine neue Art von Objektivfassungen" *Zeitschrift für Instrumentenkunde*, heft 5, p. 170, 1894.

PHOTOGRAPHY IN COLOURS.*

Second Lecture.

In my lecture on Friday night I tried to tell you how what are called photographs in natural colours were made by the chemical or, I think I might say, by the analytical method, that is, the plates analysed the light to produce the colours. The disadvantage of Lippmann's process is that, like the old Daguerreotype, we are unable to print from the picture thus obtained, and, if we want more than one copy of each subject, we must expose as many plates as we want copies. I hope to explain to you to-night how we can produce any number of copies of a subject in the colours of nature. This, I think, can be rightly stated to be done by synthesis, or a building up of the colours by admixture of lights and not by analysing light.

I must again preface my lecture with an explanation. You will remember that we produced a spectrum and proved that white light was composed of six colours. But from the researches of Young, Helmholtz, and Clerk Maxwell it is generally accepted that, although we have six spectrum colours and millions of tints formed by admixture of these colours in particular proportions, yet our eyes are provided with what are called three nerve fibrils in the retina, one conveying the sensation of red, another green, and another blue. One end of the spectrum affects the red, the other the blue, and the middle the green. But now you may ask, What about the intermediate colours? Well, an intermediate colour, like yellow, affects two adjacent fibrils, the red and the green, and we get a result due to the combined action of the two. I hope to be able to show this to you experimentally later on.

The first suggestion which opened up the field of research in this direction, *i.e.*, of heliochromy, was made by Henry Collen, Queen Victoria's drawing-master, in 1865. Utilising Sir David Brewster's theory of the three primary colours, red, yellow, and blue, he proposed making negatives by these lights and superimposing prints in colour from the same. We know now that these primary colours are not what we want, and that the results obtained by this method are not correct; at the same time it seems to me that we should recognise in Collen's suggestion the germ of the results we can show you to-night; it seems to me from this suggestion everything that has been done since arose, and there is a disposition to ignore this fact.

In the same year, 1865, Baron Ransonnet, of Austria, suggested making three negatives, one through red, another through yellow, another blue glass, which were printed on a litho stone, and then, when impressions were pulled from these stones in suitable inks, one on top of the other, good productions of coloured objects would be obtained.

In November, 1862, Ducos Duhauron patented a process similar to Collen's, differing, however, in the details of procedure, and immediately afterwards Cros, of Paris, published another modification of Collen's process. In 1869, December 3, Poirée, of Paris, proposed using more than three negatives.

No matter what process had been suggested up to this time, there was an initial difficulty which was met with in practical work. Some of you are photographers, and know as much probably about what I am going to tell you as I do myself; there are, doubtless, some here, however, who

* Affiliation of Photographic Societies.

do not know this fact, or know it only superficially, therefore I must explain. When we examine a spectrum or a colour chart you will admit that the brightest colour (that is, the one most nearly allied to white) is yellow; but, supposing we take a photograph of this chart, what will be the result? We shall have yellow reproduced as black, and the blue, which is, to us, a comparatively dark colour, reproduced as white or nearly so. Then, we may state that visually yellow is the brightest colour, but photographically blue and violet are the brightest. This is important, for up to the dates mentioned just now we had no means of knowing how to reproduce yellow as nearly white, and this was one of the greatest stumbling-blocks, the initial stumbling-block that stood in the way of successfully carrying out any process that had been suggested for producing three-colour prints.

In 1873 Dr. H. W. Vogel, of Berlin, accidentally discovered that addition of certain colouring matters to the emulsion made the silver salts sensitive to yellow, and the subject has been still further investigated, till at the present time we have it in our power to sensitise a plate for the whole or nearly the whole of the spectrum.

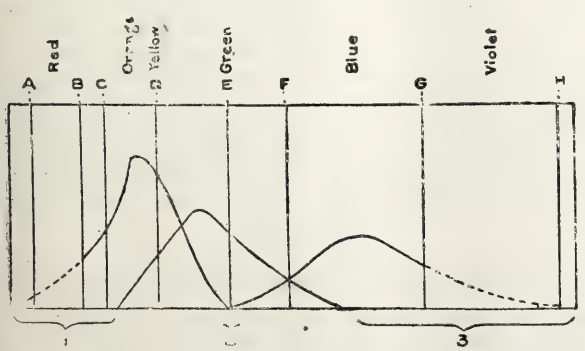
This was a most important discovery, not alone for general photography but for three-colour work especially, and it was recognised by Duhauron, and in 1876 he abandoned Brewster's primary colours, and patented a process in which he used blue, carmine, and yellow substances to compound all the tints of nature or the artist's.

In 1876 Albert, of Munich, utilised the collotype process for making these colour prints.

In 1885 Vogel published a book on his colour sensitising process entitled *Die Photographie farbiger Gegenstande in den richtigen Tonverhältnissen;* or, *The Photography of Coloured Objects in their Correct Tonality or Value*, and, after a sketch of the previous attempts, he suggested what he considered a very great improvement, which consisted in using sensitisers for each individual colour of the spectrum—a sensitiser for red, for yellow, for green, and for blue green—none being required for blue; and from these negatives to print with the colours with which they were sensitised, or, if this was not possible, with colours which were spectroscopically the same. I need not point out that this presented numerous difficulties, and is practically and theoretically wrong.

In 1887 Stolze, of Berlin, proposed an improvement, namely, the application of the Young-Helmholtz theory of colour vision. He said, "Although the colours correspond with certain external processes in nature, there is also no doubt that colour as such is nothing objective, but a subjective sensation based upon the peculiar irritation of the visual nerves by those external proceedings. We can, therefore, only hope to produce a picture in natural colours when we are able to reproduce upon the same the procedings which furnish to us the colour impression. Thomas Young assumes that there are three kinds of nerve fibres sensible to red, green, and violet. Objective homogeneous light excites all three; but with red the first is excited strongly, the second and third weakly; with violet finally, the third strongly, and the first and second weakly. If all three kinds of nerves are equally strongly excited, the impression of white light will take place." Stolze suggested a process based upon the above, and it was unfortunate that the theory was not quite correct as pointed out by Clerk Maxwell.

I will now show you Clerk Maxwell's diagram of colour vision and explain it fully, premising, first of all, that for the first time appears the master of heliochromy, Mr. Fred. E. Ives, of Philadelphia. To him we are indebted for the clearest exposition of the true theory of three-colour work, and to him we are indebted for having shown us how to practically set about it.



I am going to quote from Mr. Ives's explanation here *literatim et verbatim.**

"In this diagram, 1, 2, and 3 are spectrum colours which represent fundamental colour sensations, because each excites one sensation only, and A, B, C are curves showing the relative power of different spectrum rays to excite the respective fundamental colour sensations. The first remarkable fact to be gathered from the study of this diagram is, that the rays which represent a fundamental colour sensation are in no case the ones that most powerfully excite that sensation. The red sensation is excited by all the spectrum rays from red to green, but most powerfully by the orange; and the negative, to represent the effect upon the fundamental red sensation, must therefore be made not through a red glass or by the red rays, but by the joint action (in definite proportions) of the red, orange, yellow, and yellow-green spectrum rays. The negative, to represent the effect upon the green sensation, must be made by the joint action of the orange-yellow, yellow-green, green, and green-blue spectrum rays, in proportion to their power to excite that sensation. The negative, to represent the effect upon the blue-violet sensation, must be made by the joint action of the blue-green, blue, and violet spectrum rays, in proportion to their power to excite that sensation."

In 1888 Ives successfully demonstrated before the Franklin Institute the correctness of his theory, and projected, by means of a triple lantern, coloured objects in all their beauty.

It is, of course, unnecessary to state that there have been many experimenters within the last few years. In 1890 Mr. Bligh Bond contributed a paper to the *Photographic Quarterly*, and a specimen collotype print was published at the same time.

In 1892 Dr. E. Vogel patented a process, and some results of his work I have here which were done by Kurtz, of New York.

Having thus summarily dismissed the later investigators, we must turn back and consider the subject generally. There are two methods by means of which we can reproduce objects in colour, the one by means of coloured lights, the other by means of pigments. Let us consider the coloured lights first, because it is the easiest and soonest got rid of. We can do it by means of a lantern and lantern slides, and by means of a special apparatus, which can only be used by one person at a time. Of the two, lantern projection is obviously the one which commends itself to us generally, because we can amuse a far greater number of people at once.

But, whether we use lantern slides or printing inks, we may divide our subject into two practical departments—first, obtaining the negatives, and, secondly, obtaining the result; let us, therefore, briefly consider how to get the negatives. We have to obtain negatives which shall be representative of the effect of the colours upon our colour sensations, and, for convenience, I call them the red, yellow, and blue negatives, because the particular negative represents the action of those colours; the negatives themselves have absolutely no colour in them; they are the same as any other negatives—black, or brownish black. The first thing to obtain the negatives is to have plates, and I may tell you that, although English commercial colour-sensitive plates may be used for obtaining the red negatives, much shorter exposures will be required if some special red sensitive plates, prepared by Lumière & Sons, of Lyons, are used. For the screen to cut off all but those rays which are wanted to act, Ives suggested, first of all, a screen of deep chrysoidine orange, with a cyanine plate; chrysoidine orange is known commercially as chrysoidine extra. Instead of cyanine, chlorophyll may be used as the sensitiser, and, as Ives has suggested the use of the chlorophyll obtained from blue myrtle leaves (*vinca major*, or common periwinkle), instead of this, I have used tincture of jaborandi diluted with an equal quantity of water, and the common ivy leaves may also be used. I would suggest here that if cyanine is used it must not be the ordinary commercial salt of cyanine, which is an iodide, but the chloro-cyanine, which can be prepared from the other; and, further, I have been making some experiments with Cæruleine S., a dye used by Higgs for his magnificent spectra of the red and infra red rays, at present with negative results.

For the yellow negative an isochromatic plate, such as Edwards's or Ilford isochromatic plate, should be used with a screen of yellow die. Ives suggests brilliant yellow—which is known commercially as chrysoidine yellow No. 354; and, finally, the blue negative through a double screen of chrysophenine yellow light and R. R. methyl violet with a rapid ordinary plate. I may add a word of caution here, that there are two brands of plates, ordinary plates, which must not be used; they are the Ilford and Edwards, both of which are slightly sensitive to yellow.

The screens can be, of course, merely solutions of above dyes held in suitable tanks, and this is the way I have been working hitherto, and I may at once tell you that I have been unable to obtain any tanks or cells in England which will withstand these solutions; all the cells I have been able to come across are parallel sheets of glass cemented with a cement which has for its basis gelatine, and all these dyes in time dissolve them. The cells I used for the bulk of my experiments now leak, and I have to obtain fresh ones. I have here a cell by Klonné and Müller, of Berlin, which, however, seems likely to fulfil its purpose admirably, and, as you see, it is specially cemented, and is said to stand alkalies, acids, and alcohol, provided with a cover, and, what is more, about half the price of English cells—but then it is "made in Germany." The composition of the liquids can only be determined by photographing the spectrum with these cells in front of the slit till you get negatives which give curves like the Clerk Maxwell diagram I showed you. It would, of course, be possible to use gelatine or collodion on glass, and stained to the right depth, and this method is an improvement on the liquid-cell arrangement.

Hurza, for the red negative, uses a screen of cochineal red and aniline yellow 1·100. Cochineal red is known as carmine, and it is insoluble in water and alcohol; the best way of getting it into solution is to rub it into a paste with a very little water, and then add solution of potash, or strong solution of ammonia, and then add the water. Aniline yellow is

* Captain Abney has pointed out that Maxwell's curves are not correct. (See Appendix.)

soluble in alcohol, but sparingly soluble in water, so that, to prepare the screen, the aniline yellow solution has to be cautiously added to the carmine solution, allowed to stand in case a precipitate is formed. For the yellow negative, a solution of malachite green 1·200, and, for the blue, a solution of ethyl violet 1·500.

Weissenberger used for the red a solution of erythrosine 1·500, and for the yellow a solution of 120 parts of cupric chloride in 200 parts of water, both liquids being one centimetre thick.

My own screens have been made from various dyes, chiefly by trial and error. But for the red I use a saturated solution of rhodamine S., with extra fast yellow diluted till, by examination in the stereoscope, it cuts off to D $\frac{1}{3}$ E in the green, for the yellow a solution extra fast yellow 1·100 is mixed with rhodamine solution till the spectrum is cut off to D $\frac{1}{2}$ E. This means that there is absolutely no blue acting for the red and a very faint trace of the yellow; in consequencee cf the extreme blue and violet sensitiveness of the plates, it is advisable to cut down the action, I think, more than has been supposed to be correct; but, whatever screens are used, they must be adjusted to the plates used. For instance, a commercial firm might prefer to employ a wet collodion, or collodion emulsion plate, and the screens must be adjusted to the sensitiveness of these plates. For collodion emulsion plates there can be no better formula than Jonas', as it gives a very high colour and general sensitiveness of about 23°–25° Warnerke.

Then, again, the screens must be adjusted to the light illuminating the object, for you all know that change in the colour of the illuminant has an enormous effect on the tint and power of reflection for particular rays of the colours of an object; as an example, take the two lights, gas and magnesium, and this as a coloured object. Between these two illustrations by gaslight there is not much difference; but, by magnesium or daylight, that is, a light relatively rich in blue rays, there is a striking difference. E. J. Wall.

(To be continued.)

MANNERISM IN POSING.

[American Journal of Photography.]

No branch of professional portrait photography is more justly subject to severe criticism than that technically known as "artistic posing." Let any one with an artistic eye examine the samples displayed in the showcases along any of our prominent thoroughfares, the result will be that the beholder cannot fail to be struck with the great similarity or mannerism in the pose in the majority of samples displayed, not only in each individual exhibit, but an almost universal duplication in the lighting of the specimens shown by some leading photographer of the town.

Few are the changes from what may be called the stereotyped mannerism, the exception being in theatrical subjects who refuse to be "took" in the regulation manner, and demand a characteristic pose.

To the general public, and we may say in the mind of the amateur photographer, nothing seems simpler than lighting and posing, yet in practice no photographic problem is more difficult, and less studied by the great majority of professionals. A photographer will occasionally get hold of a sitter with a fine characteristic head. He gets his subject into a position, we will say by accident or good luck, where the lighting will bring out all the striking characteristics; the resultant picture will be all that can be desired, and prove a drawing card—admired by art lovers and extolled by the press. Now, what is the result—for the next year or two, every sitter, male or female, from infant to tottering patriarch, will all be posed in precisely the same light, angle, and position, no matter how unsuitable it might be.

Then, again, this man's competitors, spurred on more or less by the free advertisements given, in the first instance, for the marked or successful portrait, will attempt to imitate that particular effect, which results in a decidedly unhealthy state of affairs, so far as individuality of pose and artistic effects are concerned.

To what an extent this mannerism in posing is carried was brought prominently before the writer's notice a few weeks ago. Thirty-two cabinets were sent to him for arrangement into groups and for reproduction; they were all prominent men, and the photos were taken by the leading photographers of this city [Philadelphia]. In this lot twenty-four were the work of one firm of deserved reputation. In technique, style and artistic effect they were above criticism, when taken singly; but, when the attempt was made to make up the desired groups, it was another thing, as twenty-one out of the twenty-four were all posed, lit and photographed in almost the same position. To make a group with every head the same pose and looking in the same direction was out of the question.

In some cases the originals or their families had to be appealed to for different pictures taken elsewhere or by different artists, so as to overcome the sameness, or the artist's mannerism in posing. In one instance, where the original was deceased and no other portrait was attainable, a reverse negative had to be made to partly overcome the uniformity.

No matter how artistic the artist's particular drawing card appeared singly, when taken eight or tenfold, the mannerism became painful to the eye and the subjects useless for artistic grouping.

Most professionals naturally will at once say that every portrait is taken singly, and upon its own merits alone, with no reference whatever to any future combination or grouping. Granted that this is the case, the artist photographer should know that no two heads will light up the same under the same conditions; there is always a something, a difference in the lines or features, that prevents the photographer from duplicating the same effects of light and shade upon two different subjects, even if the chair and head rest are kept in the exact position for both. The photographer who strives to cut loose from a set style of mannerism in posing will soon see the wisdom of the course.

Let the specimens in the show case or display window be as varied as possible. Show studies of the face at all angles. If the operator is not up in the art of posing, or lacks experience in judging the effect of the light on the various angles of portraiture, he can by a simple device greatly improve himself. Let him buy a life-size plaster cast of any of the Greek marbles, such as are sold by Italian image-vendors in every large city; then place the head at any angle or light in the studio, focus, and study the effect of lighting and shadows on the ground glass by turning the bust, increasing and decreasing the illumination. The effect can be studied far better than upon a human subject.

The photographer should always bear in mind that expression is essential to a portrait, and, no matter how glossy the Aristo may be, it will be worse than worthless if the pictured face fails to reproduce the individuality of expression of the original.

This result can only be obtained by studying the features carefully, posing so as to keep the expression and lighting so as to avoid all false shadows.

In this particular branch of our art we are to-day not so far advanced as were some of the early pioneers who practised the Daguerreotype art half a century ago, when every face and figure was carefully studied by the operator before the final pose. Take, for instance, some of the efforts of the late Marcus A. Root, that are still in existence, unexcelled for expression and beauty of finish, and no two alike in pose. It would be well for the present generation of operators to study, wherever they can, specimens of such old masters in the heliographic art as Root and Mayall, both originally from Philadelphia, but subsequently of world-wide reputation. Julius F. Sachse.

Our Editorial Table.

How to Make Ferrotypes.

This booklet is issued by Jonathan Fallowfield, and is described as a concise and complete guide to the whole process of ferrotype. The ferrotype, we may explain to such as require the information, is the wet-collodion positive process, as used with blackened tin plates instead of glass, and is the favourite method of producing portraits by seaside and roadside "artists." But, on scanning the pamphlet, we find that dry ferrotype plates are also supplied ready-sensitised, for the booklet is, in a large measure, also a price list of the appliances requisite for starting and conducting a ferrotype business. Mr. Fallowfield supplies the *brochure* free to the profession; to non-professionals fourpence. The instructions and formulæ are quite excellent.

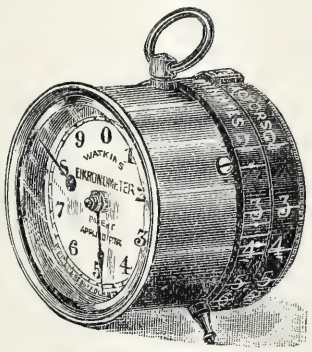
"How to make a Hand Camera for Three Shillings."

This pamphlet (James Henderson, Red Lion-court, E.C.) is just a little extraordinary, because, out of the three shillings which the camera is to cost, an expenditure of three shillings and twopence is incurred at the outset for a lens. The body of the camera cannot be said to involve a great financial outlay, as the aspirant after the coveted article is recommended to "prowl about the house when the coast is clear, and (says the author) I shall be astonished if you don't discover some old box or other that has contained soap, or starch, or suchlike household stuff," which is to supply the material for the camera. "If the wood is rough, we should plane it; if no plane is available, it may be rubbed smooth on both sides with sand paper—and patience," and so forth. But even sand paper costs money, and, seeing that three shillings and twopence of the three shillings the whole thing is to cost have already gone, we have nothing left to

invest in this useful abrasive. A red-hot poker is to render its powerful aid in perforating the front for the lens, and other non-costing dodges are suggested. And does the writer actually imagine that even the very greenest of photographic aspirants are to be captured by this sort of thing?

The Eikronometer.

This is the latest outcome of the ingenuity of Mr. Alfred Watkins. It is described as "an exact method and instrument for timing photographic development with any developer (pyro-ammonia excepted) to get uniform negatives under varying conditions." The Eikronometer is shown in the accompanying drawing. The hand moves round the



dial in 10 minutes; it is always started at 0, and the 0 represents 10 when the hand reaches it again. On the second round 1 is 11, 2 is 12, and so on, while on the third round, should it ever be required, 0 represents 20, 1 is 21, and so on.

The circular slide rule on the circumference is used to multiply the "time of appearance" by the "multiplying factor." The movable scale is that of the multiplying factors, and the solid pointer is factor 1, or the time of appearance.

If the time of appearance is *less than one minute*, it is represented by a figure which is a fraction of 100. Thus, 25 equals ¼ minute, 50, ½, and 75, ¾ minute. The bevelled glass face revolves by pressure with the fingers, and the indicator on it is used to set to the total time of development. The clock goes in any position, and is most conveniently used face upwards.

Minutely detailed instructions for using the Eikronometer accompany each instrument. We have not as yet had leisure for trying it; when we do, we shall probably have more to say concerning its behaviour. We may add that much valuable information relative to developers is compressed in the pamphlet of instructions. It is made by R. Field & Co., 142, Suffolk-street, Birmingham, by whom also it is supplied to the dealers.

Practical Photo-micrography.

By Andrew Pringle, F.R.M.S. London: Iliffe & Son.

As the author says in his preface, "this manual is purely practical." This being so, the numerous photographers who are turning their attention to the fascinating and educational art of photographing the objects of minute nature as seen by the microscope, but whose time or tastes disincline them from studying the subject theoretically, will not fail to be gratified.

Mr. Pringle has during late years shown himself to be such an adept in micro-photography, more especially in its higher departments, and has so thoroughly qualified himself for being a teacher of the subject, that the reader need not have the slightest hesitation in placing himself entirely in Mr. Pringle's hands, and accepting the statements herein to be found as decidedly *ex cathedrâ*. The topics embraced include the microscope and its parts, photo-micrographic apparatus, objectives, and oculars, the condenser, illumination, the general routine of practice, and, we need not say, all about developers, and the preparation of tissues, and other subjects to serve as objects for photographing.

The book is well printed.

Otto Paper.

Mr. Otto Scholzig, of 31, Binfield-road, S.W., has introduced a brand of sensitised printing paper under the above name. We have tried a sample sent to us. It has a very smooth surface, prints quickly to a rich deep colour, and takes a good tone in the bath recommended, which is one of the combined toning and fixing class, and which is composed as follows:—2½ ounces hypo dissolved in 16 ounces of water; 2 drachms sulphocyanide of ammonium; and, after solution, 5 grains of gold. This should stand for twelve hours before being used. The prints are transferred to this after removal from the printing frame, and without previous washing.

Catalogue Received.

Messrs. Barclay & Sons, Limited, of 95, Farringdon-street, E.C., have issued a catalogue of photographic apparatus and materials, occupying sixty-four pages, and freely illustrated. In it we find particulars and prices of a great variety of cameras, lenses; dark room, developing and printing appliances—in short, all that supply the ordinary needs of the dry-plate photographer. For the benefit of agents and dealers, an alphabetical code of discounts is employed.

News and Notes.

Erratum.—The concluding sentence of the penultimate paragraph of our article last week on *The Development of Positives on Opal* should read, "This treatment leaves no after-unevenness of surface."

Total Production of Gold and Silver.—M. Edmond Théry, Director of the *Économiste Européen*, states that the whole production of all the mines in the world, from the discovery of America, in 1493, to the year 1892 inclusive, amounts to 233,950 tons of silver, representing, at the present nominal value of that metal, 51,936,000,000 francs, or 2,077,440,000*l.*, and 12,358,932 kilogrammes of gold, representing 42,564,000,000 francs, or 1,702,460,000*l.*, making a total of 94,500,000,000 francs, or 3,780,000,000*l.* The total quantity of gold would form a cube of 8·62 metres side, and a base of 74·3 square metres area. With the same base, the 22,280 cubic metres of silver already extracted would form a solid column of 300 metres in height, exactly equal to that of the Eiffel Tower.

Society of Arts.—The one hundred and fortieth Annual Meeting of the Society of Arts was held on Wednesday, June 27, Sir Henry Doulton (Vice-President of the Society) in the chair. The principal business of the meeting was the reading of the annual report and the election of the new Council for the year 1894–5. The Prince of Wales was re-elected to the Presidentship, which office he has filled since 1864. The new Vice-Presidents elected were H.R.H. the Duke of York, the Earl of Rosebery, Lord Halsbury, and Sir Courtenay Boyle. The new members of the Council were Captain Abney, Mr. Wolfe Barry, Lord Belhaven, and Mr. A. Siemens. The report, which was read by the Secretary, Sir Henry Wood, summarised the work of the Society for the past year, and referred specially to the Chicago Exhibition, for which the Council of the Society had acted as a Royal Commission.

An Unsuspected Cause of Fog.—"A short time ago a correspondent puzzled us," says *Photographic Scraps*, "very much by an experience he had with Ilford isochromatic plates. Three or four out of a box showed patches of fog on them of a very defined character, but in different portions of the plate in different instances. He was inclined to blame the plate, but nothing in the manufacture or packing of them could account for the trouble, as we explained to him. After many suggestions and a considerable number of tests, it was discovered that our correspondent had been in the habit of using the yellow screen for most of his exposures, but, when not required, it was laid inside his camera, on the bellows, and the fog complained of arose from the light being reflected from the surface of the glass as it lay on the bottom of the camera. Of course the varying shapes of the fogged portions arose from the different positions at which the screen lay on different occasions. Moral.—However experienced you are, and however careful your working, be sure that you *may* make mistakes. From the experience of many years, we say, with absolute confidence, that in ninety-nine cases out of one hundred faults complained of by users arise from errors of one sort or another in working. There are so many possible sources of error that, however clever you may be, there are ninety-nine chances to one against you. Try and find out your error by going carefully over your working, and, if you finally fail to find out the cause, send us all possible particulars with the faulty result, and we can in almost every case point out the cause of trouble, and will do so fully, whether it lies at your door or ours. If ours, you may depend on a courteous reply."

The Popular Photographer.—"Poor fellow! He must have an infinite amount of tact and patience," says Sharland's *New Zealand Photographer*; "he must be quick to discern the individual peculiarities of his clients, and to adapt himself to the occasion. When worried and vexed by troublesome sitters or fractious children, he must smile benignly, and be charming in his manner. When, after an hour spent in getting a perfect picture of a group of four infants *and a dog*, he must be prepared with delight to do it all over again if the fond parents want another position to choose from, and never, no, never, use a big, big D—not even in the dark room. He must most cheerfully accept personal responsibility for that horrid frown, that ugly mouth, and all defects and deformities in the original of his sitters. He must hear with delight when all the credit for a pleasing picture is given to the sitter as when he is told that Miss Fluffy always makes a good photograph, you know. He must be prepared to conceal all personal blemishes by careful retouching.

before he exhibits his proofs. He must present the ideal rather than the real, particularly to those delightful sitters who want no flattery, but who wish to be taken 'Just as I am, you know,' who particularly hate those horrid touched-up things, and who think all the rest of the world vain and conceited. He must be pleased to take two or three negatives in different positions, just to let the sitter choose which is the best. If proofs are not at once approved, he will suggest another sitting and some change in costume, in the hope of pleasing his patron. He will read all weakness in character, and administer the right tonic; will tell a homely dame that she has youth and beauty on her side, and praise the nobility of character in the most commonplace of mankind. He will do all this and more; he will keep a stock of toys for the children, not to mention cakes and confectionery; will have afternoon tea for lady patrons, and will stand a shout all round for his country customers. He will throw out all defective prints; will mount, spot, and burnish, or enamel himself, so that there shall be no fault found with the work; will send home the photographs; will never keep his customers waiting, but will patiently wait himself, half an hour if need be, while a lady is 'doing her hair,' and all for seven-and-sixpence a dozen, or for fifteen shillings he will give you into the bargain a guinea bromide opal as a present. We only wonder that is not handsomely framed at the price. Yes, they have rosy times. The trade is rushed, for there's money in it—lots of money somewhere? Who would not be a photographer?"

ROYAL INSTITUTION.—Mr. Ludwig Mond, F.R.S., has made a proposal to the Managers of the Royal Institution of Great Britain to convey to the members of that Institution the freehold of No. 20, Albemarle-street, to be held by them for the purpose of a laboratory, to be named "The Davy-Faraday Research Laboratory of the Royal Institution," and for the purpose of providing increased accommodation for the Institution. The Managers, at their meeting on the 2nd inst., most cordially and gratefully accepted this munificent gift, made in the communication from Mr. Mond, of which the following is an extract:—"In the year 1843 a proposal was made to establish at the Royal Institution a School of Practical Chemistry, which was not only to give practical and systematic instruction to students, but was also to provide a place where original researches could be conducted by individuals skilled in manipulation, and where the professors could work out their problems by the aid of many qualified hands. This proposal was submitted by the Managers of the Royal Institution to Professors Faraday and Brande, who expressed their strong approval of the end proposed, and their desire that it might be carried out at the Royal Institution, 'if it could be done well;' but, on a closer examination of the limited space within the walls of the Institution, it appeared impracticable to afford accommodation for carrying out the proposed scheme. In 1846 the Royal College of Chemistry was founded, and since that time numerous schools for the teaching of practical chemistry have been established all over the country. These, however, only cope with the first part of the scheme recommended in 1843, while, as to the second part, viz., founding a laboratory for the carrying out of independent researches, no adequate provision exists in England up to this date, although the need for it was so strongly felt so many years ago, and its importance for the advancement of science so forcibly dwelt upon by the promoters of the scheme, and by such men as Faraday and Brande. . . . . It has been my desire for many years to found a public laboratory which is to give to the devotees of pure science, anxious and willing to follow in the footsteps of the illustrious men who have built up the proud edifice of modern science, the facilities necessary for research in chemistry, and more particularly in that branch of the science called physical chemistry. I have come to the same conclusion as the promoters of the scheme of 1843, viz., that such laboratory would still have the greatest prospect of success under the ægis of the Royal Institution, that, in fact, it would be the consummation of the work which this great Institution has been fostering in its own laboratory, with such remarkable results, by the aid of the eminent men whose services it has always been fortunate enough to procure. As only want of space prevented the Royal Institution undertaking this task fifty years ago, I took the opportunity which offered itself last year of acquiring the premises, No. 20, Albemarle-street, adjoining the Institution. This property I found very suitable for the purposes of such a laboratory, and large enough to afford, besides, facilities to the Royal Institution for a much-needed enlargement of its present laboratory and its libraries and reception rooms, which I should, with great pleasure, put at the disposal of the Institution. Being convinced that the Managers of the Royal Institution will give all the encouragement and aid in their power in the foundation and working of such a research laboratory, I hereby offer to convey to the Royal Institution the freehold of No. 20, Albemarle-street, and also the lease I hold from the Institution of premises contiguous thereto, to be held by them for the purpose of a laboratory, to be named 'The Davy-Faraday Research Laboratory of the Royal Institution,' and also for the purpose of providing increased accommodation for the general purposes of the Royal Institution, as far as the available space will allow, after providing for the requirements of the research laboratory. I also offer to make, at my own expense, all structural alterations necessary to fit the premises for these purposes, and to equip the Davy-Faraday Research Laboratory with the necessary apparatus, appliances, &c., and to make such further adequate provision as will hold the Royal Institution free from all expense in connexion with the premises and the working of the said laboratory." . . . .

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,269.—"Improvements in Photography." A. B. CHATWOOD.—*Dated June*, 1894.

No. 12,294.—"Improvements in or connected with Magazine or Hand Photographic Cameras." E. H. M. SEYMOUR.—*Dated June*, 1894.

No. 12,430.—"An Application of Carbon Printing for producing Photo Etchings in Line and Half-tone." W. T. WATSON and J. W. WOODIFIELD.—*Dated June*, 1894.

No. 12,517.—"A Photographer's Dark Shutter." A. A. OVEREND.—*Dated June*, 1894.

No. 12,563.—"A New or Improved Developing Tank for Photographic Purposes." W. RIGG and P. RAYMONDE.—*Dated June*, 1894.

No. 12,685.—"A New Focussing Appliance for Photographic Cameras." E. M. M. SMITH.—*Dated June*, 1894.

No. 12,736.—"Apparatus for Developing Photographic Plates in Daylight with a minimum amount of Developer." G. A. BARRETT and D. M. JONES.—*Dated June*, 1894.

No. 12,750.—"An Improved Stand or Rack for Displaying Cards, Photographs, and other articles." H. C. HALL.—*Dated June*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
9	North Middlesex	
10	Birmingham Photo. Society	
10	Great Britain	
10	Hackney	*A Beginner to Beginners.* A. D. Fort.
10	Manchester Amateur	
10	Oldham	Excursion: Peel Park Museum, Manchester. Leader, J. Greaves, jun.
10	Paisley	
10	Stockton	
10	West London	
11	Leytonstone	
11	Munster	
11	Photographic Club	Members' Open Night.
11	Southport	
11	Stockport	
12	Birkenhead Photo. Asso.	
12	Glossop Dale	
12	Hull	
12	London and Provincial	
12	Manchester Photo. Society	
12	Oldham	
13	Cardiff	
13	Croydon Microscopical	
13	Halifax Camera Club	
13	Holborn	
13	Maidstone	
14	Hackney	Exc.: Carshalton. Leader, W. L. Barker.
14	Hull	
14	Oldham	Excursion: Monsal Dale and Ashford. Leader, Tom Heywood.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 28,—Annual General Meeting,—Mr. A. L. Henderson in the chair.

The CHAIRMAN, who had hitherto been an honorary member of the Association, was elected an ordinary member by acclamation.

Mr. FRESHWATER (Hon. Secretary) read the annual report of the Association as follows:—

THE TWELFTH ANNUAL REPORT OF THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

In presenting the Twelfth Annual Report, the Committee wish to congratulate the members on the work done of the past year.

The attendance has been quite up to the average, and a good many new members have been elected during the past year, though perhaps there have not been so many valuable papers read as during previous years, but what have been read have been of considerable interest, amongst them being, *The Less Customary Applications of Orthochromatic Photography*, by Mr. W. E. Debenham; *On the Amount of Hypo and Silver left in Albumen Paper at different stages of Washing*, by Messrs. Haddon and Grundy; A demonstration on *Developing with Metol and Glycin*, by Mr. Morgan; a paper with demonstration of *Aluminium Flashlight*, by Mr. Bolas; *On Varnishing Films*, by Mr. Barnes; *On the Preparation of Plaques for Vitrified Photographs*, by Mr. Haddon; *On the Use of Dr. Andressen's Developing and Toning Cartridges*, by Mr. Leblanc; Mr. Burdick, of Chicago, showed his new Air Brush; Mr. Howard Farmer gave a very deep paper, the title of which was *Hurter & Driffield or the Men with the Money Bags; On Rough-surface Printing Paper*, by Mr. Robinson; a demonstration of the Ilford P.O.P., by Mr. Howson; a lecture by Mr. Fry on *Printing-out Papers;* Mr. Birt Acres on *Carbon Printing*, illustrated by lantern slides and specimens of work in different colours; *Photo-zincography, and its Most Recent Improvements*, by Mr. W. T. Wilkinson; another paper by Messrs. Haddon and Grundy, *On the Amount of Silver contained in Bromide Plates; The Life of Rejlander*, by Mr. Oakden, and illustrations by means of the lantern of many of his best-known works.

The Ladies' Night, with lantern and musical entertainment, under the charge of Mr. W. D. Welford, was well attended.

The Lantern Evenings have been much appreciated. Mr. Hepworth gave a very interesting lecture on *A Recent Trip to the Lakes*, illustrated by nearly fifty slides; *The Cornish Mines*, by Mr. Burrows, of Cambourne, shown by the Hon. Secretary; *The White City*, lent by the Eastman Company, and the *Amateur Photographer* prize slides. The members might do a great deal more in the slide way, for, at the Association night at Pall Mall, it was with difficulty enough members' slides could be got together.

Mr. Bayston read a paper, *Are Saturday Outings a Success?* which led to a long discussion on the subject, and, as they had not been well attended, it was decided to discontinue them this year. We had two fairly good ones at the Tower and the Zoo.

The Library has not had many additions, but is in good order under the care of the Librarian, Mr. Pask.

The Affiliation scheme is making progress, two very valuable papers having been read by one of our members, Mr. Wall, and the Association is well represented on the Committee by Messrs. Everitt and Pask.

The Association has lost two of its members by death: Mr. Coghill, of the Royal Veterinary College, and a very able member, Mr. Levy.

Although there have been more new members elected this year than last, we must ask the members to look around, and see who they can bring into the ranks of the Association, and for every one who resigns his place should be filled up with at least two others.

We must call the attention of the members to the matter of papers for discussion. Fifty-two meetings in a year is a lot to find material for discussion, and the Secretary is bound to appeal very strongly to its members to give him as much support as possible, so as to keep up the interest the meetings.

A new feature in the work of the Association has been an Exhibition of members' work. Nearly one hundred pictures were hung on the walls of this room, and a number found their way to the Central Club, and were on view for some time.

The SECRETARY also gave a *résumé* of the balance-sheet.

On the proposition of Mr. R. Beckett, seconded by Mr. P. EVERITT, the report and balance-sheet were adopted, the latter gentleman remarking that he thought the thanks of the Association were specially due to Mr. Freshwater for the satisfactory condition to which he had brought the finances.

The election of officers for the ensuing twelve months resulted as follows:—*Trustees:* Messrs. J. Traill Taylor and J. B. B. Wellington.—*Committee:* Messrs. E. H. Bayston, J. Weir Brown, Thomas Bedding, W. Cobb, T. E. Freshwater, J. E. Hodd, E. W. Parfitt, and J. S. Teape.—*Curator:* Mr. A. Haddon.—*Librarian:* Mr. F. W. Pask.—*Recorder:* Mr. G. W. Atkins.—*Hon. Secretary* and *Treasurer:* Mr. P. Everitt, 88, Evering-road, Stoke Newington.

A cordial vote of thanks was passed to Mr. Freshwater for his services during the past year, and in acknowledging it that gentleman said that he hoped to be able to assist the Association as much as heretofore.

The Chairman showed a wide-angle lens of two inches focus by Swift & Son; also negatives taken therewith.

PHOTOGRAPHIC CLUB.

JUNE 27,—Mr. Frank Haes in the chair.

The Chairman showed several whole-plate prints from negatives on anti-halation plates, which had been backed with caramel. One had forty minutes' at *f*-25, at three in the afternoon—result, reversal of image. All the results, except one, showed halation to a marked degree.

Comparative exposures made on isochromatic plates, with screen, also showed halation, but only to a small extent.

Mr. E. W. FOXLEE was of opinion that the reversed picture had been much over-exposed.

Mr. J. A. SINCLAIR said he thought the plates used by Mr. Haes were not supposed to obviate the halation which one could see, but that in photographing such a subject (the interior of St. Bartholomew's, Smithfield) he would suggest going on a dull day.

NEW DEVELOPERS.

Mr. SINCLAIR asked if any one had tried "Velox." He had tried it, and could not obtain any better result than with pyro-ammonia, or even so good.

Mr. THOMAS BEDDING said that, in using Wratten's ordinary plates, he had not obtained any better result with Velox than with pyro-soda. He could, however, confirm the suggestion that the developer has a different effect with different brands of plates, as he had quite recently used some Ilford medium isochromatic plates, developing with metol and sulphite. He waited some considerable time, and almost came to the conclusion that he had omitted to withdraw the shutter of the slide, as no result was visible. After washing the plate, however, he used Velox, with the result that the negative developed up well in about four minutes. He successfully developed five other negatives in the same solution strengthened.

Mr. SINCLAIR, referring to the use of metol with ammonia, said it was an excellent developer for films, but it had an ill effect upon his hands.

Mr. R. P. DRAGE had used the same formula, and he had found it stained his fingers considerably; but it had not affected his fingers to the same degree as Mr. Sinclair's.

Mr. J. NESBIT spoke in favour of amidol.

Mr. SINCLAIR showed and described Watkins' eikronometer, an instrument for use in the development of plates, giving an exact method for timing development with any formula (except pyro-ammonia) to get uniform negatives under varying conditions.

Mr. TROUP asked if any one could account for the result that he invariably obtained, viz., in development of Cadett plates he first saw an outline of the horizon faintly, which afterwards entirely disappeared, and it would be another minute before the picture appeared. The result was perfect, but he had wondered why this faint image should appear and then disappear.

The question remained unanswered.

Speaking of old developers, Mr. BEDDING remarked that Mr. Hollyer still used ferrous oxalate for negative development.

East London Photographic Society.—June 26, Mr. Wilkinson (Vice-President) in the chair.—Mr. UFFINDELL gave a demonstration on *Flash-light Photography*, before commencing which he exhibited some simple apparatus to take the place of expensive flash lamps, simply consisting of gas burners, with the enamel portion taken out and fitted into lids of tins. Two groups of the members were posed, and an exposure of each was made, and afterwards developed with pyro and soda, the negative turning out very well. Mr. G. S. Pasco exhibited his picture, *Marshland*, which had recently taken the 3*l.* 3*s.* prize of the chemists and druggists' assistants.

ON Saturday a good gathering of the members had an outing to Broxbourne and neighbourhood, which proved very successful.

Hackney Photographic Society.—June 26, Mr. Grant presiding.—It was decided to alter the Society's excursion on July 28 to High Beech instead of Rickmansworth. Mr. C. A. Russell was elected a member. A letter was read from the President-elect of the Photographic Convention, inviting members to Dublin on July 9 to 14. Members' work was shown by Messrs. Moore, Roofe, Hudson, Grant, Selfe, and Guest. A question was asked as to whether "Stickphast" paste would make P.O.P. prints fade. Several members, in reply, had used it for a considerable time, one as long as five years, and had found it to be quite harmless. The rest of the evening was devoted to a sale and exchange of apparatus among members.

Leytonstone Camera Club.—The second Annual Dinner and Third Annual General Meeting of this Club was held at the Masonic Hall, High-road, Leytonstone, on the 27th ult., and was well attended. After partaking of the good things provided, the business part of the evening was proceeded with. The Hon. Secretary read his report for the past year, showing that seventy-six fixtures had been held in addition to the Exhibition week. There were 104 paid members. The Exhibition had been a great artistic success, and financially had added about 5*l.* to the Club coffers. The Club balance-sheet was presented and adopted, leaving a good balance to be carried forward to the next year's account. Altogether, the Society was in a very sound condition. The Hon. Secretary (Mr. A. E. Bailey), in responding to the toast of the officers of the Club, gave thanks for the very hearty manner it had been received, and for all the personal references to the services he had rendered, more particularly as he was that evening resigning the position, which announcement was received with great regret. The election of officers was next proceeded with, with the following result:—*President:* Dr. W. Pickett Turner, E.C.C.—*Vice-Presidents:* Messrs. E. Widdrington Byrne, Q.C., M.P., W. B. Whittingham, A. Horsley Hinton, D. J. Morgan, and T. F. Sanderson.—*Council:* Messrs. G. E. Cox, A. Frost. C. A. Russell, A. C. Harwood, W. J. Battle, A. P. Wire, C. Andrews, A. E. Bailey, J. Woodcock, and C. Tabor.—*Hon. Treasurer:* Mr. Tom Symmons.—*Hon. Secretaries:* Messrs. F. W. Wates and G. H. Cricks.—*Assistant Hon. Secretary and Librarian:* Mr. W. C. Hall. The remainder of the evening was devoted to music, vocal and instrumental.

Putney Photographic Society.—On June 23 the members of this Society had an outing to Burnham Beeches, under the leadership of Mr. W. Martin, jun. (Hon. Secretary), a very enjoyable afternoon being spent at this favourite resort of sylvan scenery, the beauty of which is hardly to be equalled throughout the country. Several plates were exposed, and a group was taken. It is advisable to back the plates, without which it is almost impossible to obtain good results of the many charming peeps through the trees. An excellent meal was served on the lawn of Macro's Cottage. The convenience of the combined rail and coach tickets issued by the Great Western Railway greatly facilitates the journey, and takes one on to the spot without loss of time or physical exertion. The next outing will take place on Saturday, July 7, to Strand-on-the-Green and Kew. Leader, Mr. H. Faulkner.

Liverpool Amateur Photographic Association.—The seventh excursion of the season was held on Saturday, June 23, the spot selected for a ramble being the charming valley of the Alyn, near the foot of Moel Famman. The party left the landing-stage at half-past ten, Rhydymwyn being reached about two hours later. The greater part of the afternoon was spent in the walk through the "Leete," the picturesque mountain and river scenery being universally admired. Dinner-tea was served at the Loggerheads Inn, after which the members of the party were photographed in a group. The return was made from Mold, Liverpool being reached about half-past nine, after a most enjoyable day. The weather was fine throughout, and, though there was rather more wind than is desirable for successful landscape photography, over fifty pictures were taken.

THE Sixth Ordinary General Meeting of the thirty-first session was held June 28, the President (Mr. A. Tyrer) in the chair.—Mr. J. W. Wade, of Manchester, read a paper entitled, *The Hand Camera and How to Use It.* After going into the merits of the "Magazine" *versus* double backs, he was decidedly in favour of the latter. He recommended a rapid rectilinear lens of about five-inch focus for quarter-plate. There was a good attendance of members, who thoroughly appreciated his suggestions and practical remarks.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road South Hackney.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

DEVELOPERS.

To the EDITOR.

SIR,—Now that the London and Provincial have started the question of which developer will produce the best negative, it may be an opportune moment to ventilate the question of developers generally. According to what we hear, every one who brings out anything of the kind urges that his formula will do the most or the best work. Of course, the "proof of the pudding is in the eating," and the comparison of developers which the London and Provincial are now on may do something to really prove the question, and the verdict will be looked out for with an amount of interest by all who are interested in the question. There are many developers now on the market which quickly produce a negative—such as it is—with little or no regard to the production of a really successful negative, being more of the nature of "soot and whitewash" than anything else; others, on the other hand, certainly produce a result with plenty of half-tone, but the density is missing and hard to obtain. To my mind, for negative work, it is a case of survival of the fittest, and, notwithstanding the battle of developers, the good old veteran pyro still looks out on the fray triumphantly, if used sensibly. Recently I have tried several formulæ with pyro as the power; but, though many different ones were used, none gave me such a richness (in half-tones, with density) as one Mr. Beckett recommends, and I cannot understand why this gentleman, in the face of this, at the London and Provincial advocates or rather uses another developer. Many developers spread, and give the impression that halation is "to the fore," but the question naturally strikes one that it is too much of the actual agent itself.

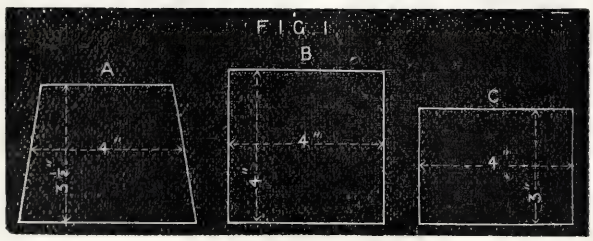
Is not the developing itself ameliorated by the use of backed plates? It certainly seemed to the writer it was so, whilst developing some plates backed with caramel—acting under advice of the modest man mentioned—for in case of known *much* over-exposure, very fair negatives were produced. If this is so, here's a power in our hands. We are told to expose for the shadows; but, if we have no latitude, what's the good? It seems as if, however, we are allowed this with caramel backing; so then let's by all means back our plates, when the developing power is improved, if I might use the word—*i.e.*, the process is simpler, and the results more pleasing, providing the right developer is used to preserve the half-tones with sufficient, and not too much, density.—I am, yours, &c.,

W. FENTON-JONES.

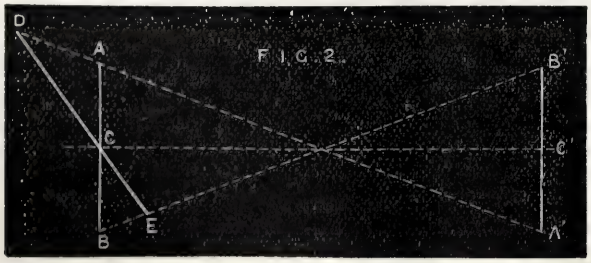
"THE SWING BACK AND ITS USES."

To the EDITOR.

SIR,—In your leading article on June 15, you give, among the uses of the swing back, the power of correcting, in copying, the distortion of convergence, caused, in the original instance, by working without having the sensitive plate vertical. May I call attention to the fact that, if the distorted photograph to be copied is inclined to the vertical, instead of the swing back of the camera, as suggested in the last paragraph of your



article, distortion of a different character is introduced, fully as serious, though, in some cases, not so apparent, as that that has been corrected. If it is desired to copy A (fig. 1), in order to correct the sloping lines, selecting the width at the centre as the measurement to make equal in



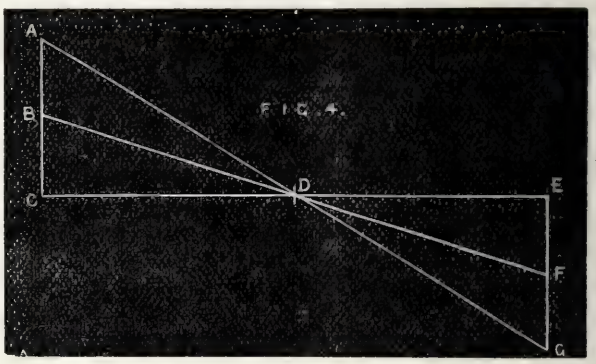
the copy, it will be higher in proportion to its mean width, and the result similar to B, if this correction is effected by keeping the original diagram vertical and swinging the back until the sloping lines become parallel; while, if the camera back be kept vertical and the original inclined, the distortion is the opposite of this, the figure is lower than it should be, and will appear as C. The reason of this is simple. In making a true copy of a diagram, A′ B′ C′ (fig. 2), the camera back, being parallel to the copying board, the corresponding points will be A B C on the sensitive plate, the distance, A B, being equal to A′ B′, and the width at C equal to that at C′. Now, if the camera back be inclined as D E, while the horizontal measurement at C will still remain the same as that at C′, the height will be greater than that of the original as D E is greater of necessity than A B, which is equal to A′ B′. In reversing the conditions, D E representing the copying board, and A′ B′ the sensitive plate, it will be seen that A′ B′ will be vertically less than D E, while horizontally they will be both equal at C. By a very extreme example this fact is made self-evident. Imagine the copying board to lean as



much as shown in fig. 3; the foreshortening is so excessive that, if the original were a square, the copy would be a figure like X.

In the third paragraph of your article it is stated that in tilting the camera and using the swing back to keep the plate vertical, the building or diagram copied will be squatter than it should. If my argument is correct, the reverse will be the case, that is, it will be too low in proportion to its mean width if the camera back is not vertical, and that an absolutely true proportion is maintained if the sensitive plate and original building or diagram are parallel. If this be not so, the theory of the truth in copying secured by parallelism of the copying board and camera screen is incorrect.

The proof of this is not complicated. If A B C (fig. 4) be a diagram on



a wall to be copied, and the camera tilted so that B F represents its centre line, and E F G the reproduction on the sensitive plate, the latter being parallel with the copying board, and D the centre of the lens, E D C, F D B being straight lines, and F D equal to D B, therefore, as the angle E D F is of necessity equal to B D C, the parallelism of B C with E F renders the angle F E D equal to the angle B C D, and the angle D B C to E F D; and, since the side F D is equal to D B, it follows that the triangle E F D is equal to the triangle B C D, and, therefore, the side E F to the side B C. Equally F G is equal to A B, and the horizontal measurement at F equal to that at B, so that any departure from strict parallelism between sensitive plate and copying board produces an image distorted in its proportions as well as in its squareness, and consequently incorrect proportion between height and width is a concurrent necessity of the distortion of convergence. I have assumed copying same size as more simple in demonstration, but it is evident that the principles involved are absolutely identical if the camera reproduction be many times smaller than the object itself, as in the case of a building. For this reason the increase of height from A to B in fig. 1, effected by swinging the camera back in copying, is equally a correction of distortion, as the more apparent correction of the converging lines, and the decrease from A to C, due to inclining the original, an exaggeration of an existing fault.

The dimensions on fig. 1 are those that would result from tilting a rigid back camera upwards 30° in order to copy a sixteen-inch square diagram on a wall one-fourth of its original scale, and then correcting the sloping lines by reproducing. B is the only correct representation of the original.

Some time ago I had to copy a badly distorted photograph of some machinery taken by pointing the camera downwards. An attempt had been made to obtain a corrected copy in a camera without a swing back by inclining the original. The incorrectness of the result was so very self-evident that it was impossible to make any use of the "corrected" photograph. Though the vertical lines were true, wheels in the front of the machine that should have been almost true circles appeared as very pronounced ellipses, the major axes being almost horizontal, and every other part so distorted that the proportions of some appeared absurd to the manufacturers. A fresh copy corrected by swinging the camera back

was satisfactory, but the height was fully half as much again as in the other reproduction, the width remaining the same in each case.

The importance of absolute correctness in copying and correcting existing errors in reproduction work is frequently insufficiently appreciated by those to whom work of this kind is only occasional.—I am, yours, &c.,

HENRY W. BENNETT.

RE BLISTERS.

To the EDITOR.

SIR,—I have read your article upon the subject in the last issue, and feel sorry for those who are troubled with them; being one of those who are not thus afflicted, I will detail the *modus operandi*.

We cannot all of us understand these intricate chemical combinations. I think a careful observance of the instructions given would lessen, and in most cases remove, the evil complained of. Knowledge, patience, and practice are required; when the conditions are understood, which can and must be acquired by the worker, are accomplished, perseverance will ensure success.

The Papers.—I have used several brands, and by different sensitisers. These are all good, and so, no doubt, are half a dozen others. Each has its peculiarities, which must be noted and humoured.

Water.—Clear, bright rain water is best, that from the tap will do; the temperature should be agreeable to the hands, not cold, not warm. After being in the first water a minute, the prints should be brushed lightly to remove the chloride from the face, rinsed, and placed in a dish or tray containing a small quantity of carbonate of soda in the water for about five minutes; they are then rinsed, and transferred to a third tray of clean water for another five minutes; then to a fourth. When all are ready, the first are toned in the usual acetate bath, and so on till the last are in. When they are toned, they are placed in a tray of clean water; when sufficient are done, another assistant places them in the fixing bath. For summer use hypo, 2 ounces; water, 20 ounces; with a small quantity of ammonia for fifteen minutes, moving them about the while. They are then rinsed and placed in a tray of salt and water for twenty minutes, after that they are rinsed and washed in frequent changes of water for about three hours, not longer. All the waters, toning, fixing, and salting baths are the same temperature, with the exception of the first one after the salting, which is warmer, to get the salt and remaining soda out the quicker and more effectually. Prints so treated do not blister nor fade. In winter the hypo bath is stronger, and the water, &c., warmer all through the operation.

I had recently a similar experience to that of your correspondent, T. R. Jeayes. Mine was an interior, which I developed with pyro soda. One hot evening it came up an inch into the picture, quite spoiling it. I walked eight miles for that. Moral.—Use pyro and ammonia in hot weather, and do the developing in the morning before breakfast.—I am, yours, &c.,

WM. GIRLING.

Stradbroke, July 2, 1894.

P.S.—The above remarks also apply to papers sensitised at home.

"THE USE OF THE SINGLE LENS IN PORTRAITURE"—A REPLY TO MR. CHESTERMAN.

To the EDITOR.

SIR,—As a constant reader of your JOURNAL, as well as a contributor to the *Studio*, perhaps you will allow me space to briefly acknowledge Mr. Chesterman's criticism of my essay in that magazine on the above subject.

My experience in the use of a single lens for portrait work has extended over nearly four years, and during that time hardly a day has passed without my taking one or more pictures with an instrument of this class. I do not wish to force my views of the matter upon Mr. Chesterman, but does his experience with this form of instrument compare with mine in variety or duration?

It has been my custom, when I have been able to spare the time, to expose plates with both forms of lenses on the same subject, and compare the results. By this means I have had some chance of forming a fair opinion as to their relative merits. At times the combined form of lens has produced the best result (particularly when the subject has been fair); but in the majority of instances it has been my opinion that the single lens gave more truly the effect of nature in the softness of its outlines. I must, however, repeat my remark at the beginning of the article in the *Studio*, that "I do not think any lens, or camera, or dry plate, or anything else of that kind, will of itself give us lifelike portraits. Whatever merit there may be in the instrument, it must always be the worker who controls, and who really does the making of the picture."

In the coming exhibition at Pall Mall I hope to have some portrait heads taken with a single lens, as described in the *Studio* article, which I hardly think even Mr. Chesterman will take exception to for their want of sharpness, although there is no such thing as absolute definition about them.

In conclusion, I may say that, when I was invited by the editor of the *Studio* to contribute to his magazine, I certainly did not anticipate adding to the already wearisome discussion on the so-called "new movement," and would far rather surrender a point or two to Mr. Chesterman, that I might join hands with him in the endeavour to produce better and more artistic work with the camera.

With many thanks for the space which you have allowed me.—I am, yours, &c.,

ERNST. LAMBERT.

"A CALL TO ARMS."

To the EDITOR.

SIR.—It is with much pleasure and personal feeling that I write to endorse the sentiments and truths expressed so forcibly, and, I may add, "bravely," by your correspondent "Rudder Grange" in last week's issue of this JOURNAL. It has been a matter of astonishment to me for a long time past how and why "professionals" have meekly submitted to such gross humiliation and humbugging treatment at the hands of our so-called "Wholesale" Houses.

Are they wholesale in *any* sense? So far as photographers are concerned; and are there *any advantages whatever* to be gained by dealing with them as against one's neighbouring chemist? I assert most emphatically, *None whatever*. In fact quite the reverse, and I speak from the experience of thirty years' professional practice. I maintain that you get more courtesy and far more discount from your chemist next door (so to speak), and save yourself the trouble and expense of "carriage," "packing," and "boxes," to say nothing of the bother of "returns," and getting "allowed" for "empties" (*when* you do), goods sent wrong, &c.

The fact is our "wholesale" Houses (I suppose I must *call* them such, though it positively annoys me to write the word) have had far too much their own way, pandering as they have done to amateurs at the expense of their real friends—the professionals—whom they snub in the coolest and most impudent manner possible, but possibly *only* in such an easy-going and apathetic community as ours.

Thanks to them, the state of our trade is to a great extent in the depressed condition it is. They ought to have been brought to their senses and boycotted in the manner your correspondent suggests long since, and let them see the mistake they make in killing the professional "goose" to get the amateur "eggs."

Personally, I have felt the insult keenly, so much so, that I ceased dealing directly with any "wholesale" house two years ago; and I would heartily rejoice to see the matter taken up by our "leading lights" with the idea of forming "stores" of our own. It's high time we (as a united brotherhood) *did* bestir ourselves and do something of the sort if we hope ever to rise out of the desponding slough our dilatoriness in such matters has got us into, and see ourselves and our now sadly despised "Art" placed on a higher level of respect and appreciation.—I am, yours, &c.,

AN OLD "PRO."

To the EDITOR.

SIR,—I wish to call your attention to the system that is coming into vogue among dealers of charging most exorbitant amounts for packing boxes, &c. I had recently to send for some goods from London, and I enclosed what I considered ample for return post, but, lo and behold! the goods arrived by rail with 6*d.* deducted from the postage money for packing. The packing consisted of a light piece of thin wood and a few pieces of brown paper that had been taken off other goods. Protesting individually does no good. Another trick is to charge a terrific price for an old used box, and mark it non-returnable. Probably others can relate equally extraordinary treatment.—I am, yours, &c.,

OTHELLO.

To the EDITOR.

SIR,—I read this morning in the *Journal* the letter of "Rudder Grange *re* Plate-makers and Amateur Competitions. I heartily endorse all his remarks. For the past two years I have been allowed twelve and a half per cent. off of plates by my local chemist, while the maker will only allow me seven and a half off. I trust brother professionals, who seem at last waking up, will carefully note your correspondent's remarks, and do as I intend to do—never spend another penny with any dry-plate firm that promotes an amateur's competition. Plate-makers evidently think we are "a long-suffering people."—I am, yours, &c.,

June 29, 1894. RUDDER GRANGE'S BROTHER.

To the EDITOR.

SIR,—Does "Rudder Grange" really imagine that it is he and his kind whom "the manufacturers have to thank for the position they hold," &c.? I rather think, and most people will agree with me, that it is to the much-abused (by such as your correspondent) amateur that the "manufacturer" owes not only the introduction of a new article, but also the creation of the great demand for it, that has called his "large

works and enormous staffs" into existence. Individually I grant that possibly many professionals employ more dry plates in the course of a year than most amateurs, but collectively the amateurs swamp them, and the sooner such nonsense is dropped as your correspondent's suggestion, that manufacturers should have the "pluck" (?)—folly, I should call it—to boycott the amateur, so much the sooner will professionals of all classes feel sufficient confidence in one another to combine with some prospect of mutual benefit.

Your correspondent's professional friend who gets his plates from the local chemist may be somebody on whom "Rudder Grange" may look with awe, but he is scarcely the class of consumer for whom manufacturers will be likely to revolutionise their whole system of business.

It was always the man who went to "the Cut" on Sunday morning to get his "two ounces of collodion" and "half-ounce of acetic," who—in his own estimation, at least—led the profession; and it still seems to be the opinion of some of them that it was they who made "Jonathan's" business what it is now.—I am, yours, &c., A COUNTRY PROFESSIONAL.

CELLULOID FILMS.

To the EDITOR.

SIR,—Some months since you published some letters of mine, relating my experience with celluloid films. Until a few days since I had never had any experience of films decreasing in rapidity with keeping. About ten days since I went to get some photographs, entailing a journey some distance by rail. I took three rapid and three medium films, all by the same maker. The rapid ones I had had by me for about six months, and I gave them exposures about two-thirds of the slower ones. They were hopelessly under-exposed; the strongest amidol developer, in ten minutes, brought out the sky and high lights, and no more. The three slower films were all right. To test the matter further, I put one of each lot in a slide, and exposed them consecutively on the same view with a shutter at *f*-11. The slower plate was all right, the other hopelessly under-exposed. I do not think this is due to the celluloid, but to the condition of the emulsion, the silver in the film being in a very coarse state of dixision; so much so, that the film, when wet and held at an angle to the light, appeared to have a surface like sand paper. Two emulsions may have the same rapidity, with the silver in different states of division; is it not probable that the coarser tends to decrease in rapidity, and not the other?—I am, yours, &c. H. G. M. CONYBEARE

South Holmwood, near Dorking, June 30, 1894.

SUMMER HOLIDAYS.

To the EDITOR.

SIR,—The principal photographers in Greenock have made an arrangement to close their studios this year again for a week's holiday at the Greenock Fair, viz., from July 9 till 16, 1894.

As this is not customary in other towns, perhaps it may be worthy of notice in your esteemed JOURNAL, in the hope that other towns may follow suit.

The following are the names of those who are closing:—Messrs. McLennan & Co., Turnbull & Sons, A. & G. Taylor, Fergus & Sons, Pratt & Co., Mr. Crawford Hamilton, and Mr. Geo. A. Brown.—We are, yours, &c., JOHN PRATT & Co.

City-buildings, Greenock, July 2, 1894.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

PHOTOGRAPHS REGISTERED:—

Debenham & Smith, Southampton.—*Photograph of the Rev. Canon Wilberforce.*

William Wilkinson, Morley, Yorkshire.—*Photograph of St. Paul's Church, Morley.*

John Stuart, Glasgow.—*Photograph of James Reid.*

Thomas Ball, Kidderminster.—*Photograph of Old Houses in Worcester-street, Kidderminster.*

CADETT & NEAL, T. H. P., W. Bishop, and others in our next.

HUGH ADAIR says: "Can you send me the address of 'Photographers' Copyright Union,' or one of the circulars as noticed in your JOURNAL?"—Our correspondent will find the address of the Secretary of the Union on page 396 of the JOURNAL for June 22.

N. WHYTE.—The stains are caused by faulty work, of that there is no question. One or two seem to be caused by splashes of some deleterious matter, and others by imperfect fixation. Generally, the print appears to be imperfectly fixed in the hyposulphite solution.

T. C. A.—If a solution of sulphate of iron does not throw down gold from old acetate toning baths it is because there is no gold to be thrown down. It has all been used up in the toning. The gold cannot exist in the solution if it has been, as it should be, deposited on the print.

A. R. MILLER (Hon. Secretary, Longton and District Photographic Society).—We have no sets of lantern slides for exhibition purposes.

ALLEGRO.—Coat the vessel with one or other of the hard paints—Aspinal's enamel, for example; but the vessel should be watched, and if the coating gets chipped, and the metal exposed, it should be repaired at once. We do not like galvanised iron vessels for washing prints in.

H. REID.—The euryscope lens is an excellent form of lens, and has a large aperture, and is correspondingly a quick-acting one. But it has a somewhat round field, and therefore will not define over a large plate unless it is considerably stopped down; then it is no quicker than any other lens with an equal ratio of aperture to its focal length.

SOMERSET.—If the white shellac swells up, and will not dissolve in methylated spirit of the strength sixty-two over-proof, it is clear that the lac is at fault. Bleached lac, with long keeping—particularly if it is kept in a dry atmosphere—becomes "perished," and is no longer soluble in spirit. Get a sample that has been freshly bleached. Bear in mind that bleached lac, when dissolved in spirit, always leaves a sediment.

A. W.—Decidedly, prolonged washing, or rather soaking in water, is very injurious to the after-stability of prints. The shorter the time of washing, provided the hyposulphites are removed, the better for the permanence of the prints. Paper prints can be more completely washed in an hour or two, with proper attention, of course, than they often are with twelve hours' soaking, while their stability will be correspondingly greater.

T. SEEWARD.—It would be quite impossible to say what is the smallest quantity of hyposulphite of soda that would suffice to fix one dozen half-plate prints unless we were informed how much unaltered chloride of silver they contained, and even then we should leave a large margin if permanence were a factor in the case. Hyposulphite of soda is cheap, and one can afford to be lavish in its use if stability of the prints is a consideration.

A READER OF MANY YEARS.—The most rapid process for line work, for newspaper work, is the ordinary "zinco process," and for half-tone work, the usual "process block." Details of both methods have frequently appeared in back volumes of the JOURNAL. If you wish to work either process commercially, you will possibly find it more economical to obtain instruction from a practical worker than begin by working out the process by experimenting.

P. DALY.—Opinions are divided—very divided, indeed, at present—as to the best way of estimating the rapidity of plates. Your experience bears out that of many others, namely, that the relative speeds marked on the boxes by the makers are not borne out in practice when the plates are used, in practice, in the studio. A Committee, appointed by the Photographic Society of Great Britain, is now investigating the subject, and in due course will, no doubt, issue a report.

A MEMBER OF THE CAMERA CLUB.—You cannot possibly hope to secure lasting fame by your suggestion of, or even patenting, any application of the principle of preventing halation by applying to the plate a substratum of coloured pellicle previous to coating with bromised gelatine emulsion, for this was not only suggested and done, but was publicly described many years ago; *inter alia*, by the late J. W. Gough in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1877.

INQUIRER.—If you engaged the operator to take the negatives for you at a weekly salary, they are, of course, your property, to do as you like with, unless there may be some agreement to the contrary. It is possible that you may not have a legal copyright in the pictures, and therefore others may reproduce them. Write to the Secretary of the Photographers' Copyright Union for the particulars they issue on the question of copyright. That will give you fuller particulars than space will permit of us doing in this column.

H. ASTON.—There is still room for a new instantaneous shutter, particularly if it be better than any of those now in use and can be supplied cheaper. With regard to the value and validity of a patent for one, we should decline to express any opinion even if details were sent. The best way will be to consult a patent agent and instruct him to make a search of what has been done before. He will then advise you whether a valid patent can be secured for your shutter. We may say that possibly more patents have been taken out in connexion with shutters, than with any other individual photographic appliance.

W. C. R.—Certainly not. What can the good-will of a business, the gross receipts of which, at low prices, are under two hundred pounds a year, be worth? When cost of material, rent and taxes, deterioration of plant and premises, are deducted, the profit left, under ordinary circumstances, will be about the wages paid to a good assistant operator. If the vendor gets the value of the plant and fixtures at second-hand price, it will be as much as the concern is worth. As the town is a small one, and the business has been established many years, there does not appear much room for improving it.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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THE YELLOW SCREEN WITH ORDINARY PLATES.

Questions that have been addressed to us in regard to the employment of the yellow screen with ordinary or non-colour sensitive plates, as well as some remarks on the subject that have recently been published, indicate the existence of erroneous ideas on the point, which it may be profitable if we endeavour on this occasion to remove.

The belief that, by using a yellow screen, more or less deeply tinted, when taking a photograph on non-orthochromatised plates, an improvement in the relative tone renderings is secured, is not by any means new. Within the last ten years in particular it has been many times promulgated, only to be as often refuted on both theoretical and practical grounds. It is not difficult to realise that, if the yellow screen possessed the properties sometimes claimed for it, not only would its enormous advantages in most kinds of photography have been demonstrated and availed of ere this, but it would have rendered the introduction of commercial orthochromatic plates and the experimental efforts of numerous individual workers unnecessary. Colour-correct photography, however, has scarcely yet reached such a delightfully simple stage.

As we are writing for the express information of many of our professional and amateur friends, particularly the former, to whom the theoretical aspect of the matter is less welcome than the practical, let us state, in the plainest possible terms, why the yellow screen is virtually of no effect with ordinary plates.

Most, if not all, the ordinary plates now available are defective in so far as their translation of tone-renderings, or, as it has been happily termed, values, is concerned. This defect is of a twofold nature. In the first place, the blue and violet colours of a subject, owing to the well-known greater photographic activity of those colours, appear too light in the positive print; while, on the other hand, the colours included between the green and red regions of the spectrum, namely, green, yellow, orange, and red, which are, generally speaking, the brightest to the eye, are too dark in the photograph. Here, then, we have a double error to rectify, and the difficulty is surmounted by orthochromatic photography, which enables us to reproduce natural objects, be they views, groups, portraits, as well as coloured pictures—in fact, anything having a variety of tint, in their true relative values or luminosities; in other words, so that the blue, the green, the yellow, and the orange, and all their various modifications, shall, in our finished prints, look just as light or as dark as they do to the eye in the originals. This is effected by impregnating th sensitive emulsion with a certain dye or dyes which impart sensitiveness to the green and yellow rays, so that objects of the latter colours are shown in the photograph correctly translated as regards their visual intensity.

It is here that the yellow screen steps in. Notwithstanding the sensitiveness of orthochromatic plates to green and yellow, only half the problem has been solved; for the blue and violet rays still retain their photographic activity undiminished, and, even on an orthochromatic plate, such colours would still exercise too powerful an influence, so that in our print the blue of the sky or of a lady's dress would continue to appear too light. To reduce the activity of the blue and violet colours to proper limits, and so that they may exert only their proportional influence on the sensitive plate, is the function of the yellow screen. This acts by holding back, as it were, a large part of the blue light, while not interfering with the green-orange colours, and, in fact, harmonises the relative colour values which the negative has to reproduce. This is, we repeat, the sole office of the yellow screen: to depress the too energetic blue light, and at the same time allow the green-yellow light to have full play.

Now, it obviously follows from this that to employ a yellow screen with ordinary plates, in the hope that better relative colour values will result, is to ignore the absence of conditions essential to success; for, in the first place, our ordinary plate has not been sensitised for green and yellow, so that, whether we use a screen or not, those colours will still be too dark in the photograph. But then it may be, as it has been, argued that, as the yellow glass cuts off a large proportion of the blue, the latter will be better rendered, so that something, at any rate, would be gained. But, even were this the case, the intensity of the yellow and green as compared to the blue would obviously not be improved or altered, so that no relative gain results. It may be pointed out that relative and not absolute improvement in tones is the chief desideratum sought.

Years back, to test this point of the influence of the yellow screen on ordinary plates, we subjected the matter to experimental examination, the issue being that the only observable effect was to increase the exposure without altering relative tone renderings, and more recently we have repeated the experiment with the same results. We can conceive that improvement possibly sometimes appears to be had with the use of a screen, but this may, and probably would be, due to the better exposure unconsciously given with the screen than without. Again, some ordinary plates may, *per se*, be slightly orthochromatic, although we ourselves have not met such, and

here an improved rendering would appear. But these are the only two possible exceptions to the recognised dictum, that the use of a yellow screen with an ordinary plate does not conduce to orthochromatic effect. The idea is false in theory and unsound in practice.

In the foregoing we have had in mind what we may term the normal circumstances of colour-correct photography, whether on orthochromatic plates or attemptedly so on ordinary plates—such circumstances as landscape or portrait work, where comparatively short exposures are imperative. There are not wanting those, however, who assert that by a very prolonged exposure, one impossible in most kinds of practical work, some improvement does result in the translation of greens and yellows; of this, however, we are without proof, and we are inclined to doubt it. One thing is certain, that, while the plate remained uncorrected for colour, the improvement could be but slight. On the whole, we unhesitatingly negative the assumption that, for any practical purposes, the use of a yellow screen with sensitise plates not corrected for colour, is of the slightest value.

RAILWAY CARRIAGE CHARGES.

Some excitement having been recently caused by the alleged partial failure of a collodion simply through railway carriage difficulties, we think it will be well to put before our readers a brief account of how the matter lies as between sender or receiver on one hand, and the railway companies on the other. It may be said at the outset that, though the various companies exercise a power arbitrary enough, they are yet subject to certain Acts of Parliament which restrict power otherwise held by their monopoly. The Act of Parliament known generally as the Carriers Act stands at the head of these restrictions, and classes railways among "common carriers." As however, there are many exceptions to the goods which common carriers may be responsible for, this Act does not apply. Thus the railway companies are not "common carriers" of railway passengers; hence, though a passenger is damaged in a collision, it is necessary to prove negligence before a company can be successfully sued for damages. Coming to articles of special photographic consumption, the companies are able to except many of them. Thus they are not common carriers of "Explosives," a very wide term, and they are in consequence able to fix very high charges for conveying them, or indeed refuse to carry them at all. Similarly with dangerous or corrosive liquids their rates are enormous, and the restrictions they place in the way of transport most annoying. We have it on the best authority that these restrictions are so harassing and almost prohibitory, that large and lucrative branches of business have been lopped off the current accounts of old established houses. The companies have well protected themselves. They have given public notice that "they are not common carriers of Explosives, and that they do not undertake the carriage of any Explosive except on special conditions," &c. Among their General Regulations, par. 2 may be quoted in full, for upon it lies the onus of the difficulties experienced: "Senders giving incorrect consignment notes, or otherwise attempting to forward any Explosive or Dangerous Article under improper declaration, or contrary to the following regulations, will in every case be prosecuted by the company to whom the article is tendered for carriage."

We may as well say at once that these requirements are well known to have been continually evaded by wholesale houses until, through this evasion having been discovered and penalties obtained, a large number of dealers have become alarmed, and will either refuse to send dangerous goods, or send only in strict compliance with the companies' regulations. What these regulations mean we proceed to show, and we do not doubt that many of our readers—even wholesale dealers—will be rather surprised at the far-reaching nature of the regulations. This information may be obtained from a book—only to be obtained through a railway office—which contains the regulations decided upon by a body composed of delegates of all the railway companies of the kingdom, and entitled, *General Railway Classification of Goods by Merchandise Trains.*

Among the articles now mainly referred to, we first find "Explosives" (page 136, paragraph 2), from which we have quoted. The authority of the company is given as "by-laws" (quoted), "made in pursuance of the Explosives Act, 1875," so that there is no doubt they have all the power assumed.

Referring to photographic materials, we have Classes II. and IV., which will mainly include flash mixtures for rapid exposures. Class II. includes a mechanical mixture of a nitrate with any form of carbon, or with any carbonaceous substance, &c. Thus, many of the pyrotechnic non-magnesium mixtures will be included in this class, while the magnesium mixtures mainly containing chlorate will be penalised under Class IV. The term "chlorate mixture," which this class is called by "means any explosive containing a chlorate." Let us now follow the matter up, and see how it bears upon the requirements of photographers. The minimum charge for nitrate mixtures, unless conveyed in metallic cylinders, is 10*s.*; 3*s.* 6*d.* is the minimum in these cylinders. But how is it with so common a requirement as magnesium mixtures, which almost all contain a chlorate? Page 144 tells us: "Not carried by any railway company!" Hence it is contrary to the law, and renders the sender liable to heavy penalties for infringement, to send this mixture by any railway company.

Leaving explosives, we have the classes of "Inflammable Liquids" and "Dangerous or Corrosive Liquids." For these the charges are high; there is a high minimum charge, and the restrictions are severe. Among others of photographic interest we find the following liquids:—Benzine, bisulphide of carbon, collodion, ether, naphtha, turpentine, spirit varnish, indiarubber solution, nitric acid, hydrochloric acid, ammonia liquid (fortissimum), bromine, &c. Most of these are subject to a minimum rate, and all to a high rate, some of which we will, in conclusion, specify. The minimum charge for collodion is 5*s.* however much the quantity, and does not include the cost of collection or delivery. Ether is the same minimum, but it includes collecting and delivery, and the rate is lower.

Many of our readers will be surprised to find that *ammonia* has a minimum of 5*s.*, and a carriage rate higher than ether, neither including delivery nor collection! Hydrochloric acid is less even than ammonia, though nitric and sulphuric acids run it even. It does seem as if the dealers who have placed such difficulties in the way of sending collodion did not strain at a gnat and swallow a camel in such a fashion as they have been doing of late. Many will not send collodion or hydrochloric acid except at these fancy rates, but we never yet heard of one who declined to send ammonia solution; and the expression "fortissimum," to our mind, clearly shows that the ordi-

nary ammonia solution, and not liquified gas, is intended to be described in that section.

We will obtain a complete list and classification of all substances likely to be of photographic use, and quote the company's restrictions, so as to be useful for reference, which shall appear in a future number.

CLEARING THE SURFACE OF FINISHED NEGATIVES.

THERE is one point in the production of the negatives to which photographers as a rule give far too little attention, namely, the securing of a smooth and spotless surface free from defects and irregularities. So long as the negative is free from stain or discolouration, and has been washed for a sufficiently long period to ensure the removal of all injurious matter from the film, it is considered that all has been done that is necessary; but in very many instances the result will be found very far removed from perfection, while in almost all there is room for some little improvement.

Under ordinarily favourable circumstances the casual observer may fail to notice any special defects in the surface of a negative after development, fixing and washing in the usual manner; but a closer scrutiny will almost invariably reveal the fact that there is more or less scum or deposit upon it, arising possibly from a variety of causes, but chiefly derived from impurities in the water employed. In very many cases, perhaps, the result is really of no practical moment, and at the worst only gives the negative an untidy appearance; but, in others, and especially when the negative is varnished, it may give rise to anything but satisfactory effects. For instance, the unevenness of surface is very frequently highly detrimental to success in retouching, anything like evenness of "tooth" being quite impossible, and we have seen examples when, except with the very thinnest and most fluent of varnishes, it has been impossible to get anything like a smooth film.

In the very worst cases the fault may be chiefly traced to mechanical impurities in the water, owing to imperfect filtration, and this is more especially the case in small towns and country districts, where the water is drawn direct from wells without any filtration beyond that which occurs naturally. But the larger cities and towns supplied by water companies are not free from the nuisance if the water is badly filtered, as witness the complaint some few years back of live eels in the water supplied by one of the London companies. Where, however, the trouble arises from such causes, it may be set down at least as much to the carelessness of the operator as to the impurity of the water, for surely none but the most negligent of workmen would employ such water in connexion with films of gelatine without applying some simple means of, in some measure, depriving the liquid of its solid impurities.

The simplest plan for effecting this consists in tying a piece of flannel or other material over the tap to arrest the coarser particles of dirt that would otherwise pass through, but there are very effective filters devised for the special purpose of attachment to the supply tap which perform the work far more efficiently. No matter how generally good the water supply may be, one or other of these devices should be regularly employed by all workers with gelatine plates or papers, or, indeed, by all photographers, for the injury that may arise from the presence of particles of sand or grit in the washing water can only be duly estimated by those who have practically experienced it.

But there is another form of impurity in the water which, if it does not cause such noticeable faults as that already mentioned, is still sufficiently annoying to the careful worker, and is, moreover, not removable by simple filtration. This consists of lime or other salts, either in solution or in suspension, in so fine a state of division as to pass through any ordinary filter. It matters very little whether these salts are in the soluble or insoluble state, since if in the former the alkali of the developer converts them to the latter condition, and perhaps, of the two, produces the worst result. The actual result will, of course, depend upon the degree of hardness of the water employed, but it is no unusual thing, in the case of spring water drawn from a chalky soil, to find the surface of the finished negative almost as "matt" as finely ground glass.

When the evil arises simply from hard water, two courses are open, if not for its prevention, at least for its removal, for, short of the substitution of distilled or rain water, which is rarely practicable, there is really no means of prevention. The curative measures, however, may consist in the first place of the use of a clearing solution, containing either acetic or preferably hydrochloric acid, either of which will convert the lime salts usually found in water—except the sulphate—into the soluble condition, and so bring about their removal from the surface, and to some extent from the body of the film. The usual mixture of alum and hydrochloric acid serves the triple purpose of hardening the film, removing pyro stain, and also any insoluble impurities from the surface of the negative, or a plain solution of either of the acids named may be used if preferred. The usual clearing solution of alum and citric acid is not suitable, for, though it effectively removes stains, the citric acid itself forms insoluble lime salts, and should therefore be avoided.

But the mere use of an acid clearing solution is rarely in itself effective, owing to the tenacity with which insoluble particles of lime cling to the gelatine surface and the slowness with which the feeble acid solution acts upon them, besides which it may very easily happen that some of the impurities may not be of a nature to dissolve in the clearing solution. Under such circumstances it becomes necessary to supplement the chemical treatment by applying gentle friction with a pad of soft linen or cotton-wool, taking care to keep both the film and the rubber well wetted while the operation is being performed, and to apply the friction very gently. The latter precaution is needful, not from any particular tenderness of the gelatine itself, but in case there may be any minute particles of foreign matter imbedded in the gelatine itself, a by no means unusual contingency even in these days of comparatively perfect films. The result of careless usage, where such happens to be the case, may easily result in the conversion of a practically inappreciable defect into one that ruins the negative; hence, under all circumstances, the greatest care should be observed.

Where the practice of friction is regularly followed as it should be, it is perhaps as well always to use a preliminary hardening solution, such as the combined alum and acid bath already mentioned, a practice still observed by very many workers and one that can, therefore, not be considered as adding anything to the trouble involved. But, when the water employed is of a particularly hard nature, it may be desirable or preferable to substitute for alum some other substance of a hardening nature that is not of itself liable to form insoluble compounds. The alkaline sulphates are known to possess a

similar indurating action to that of alum, and from amongst these we should choose the potassium salt in conjunction with a little free hydrochloric acid. Chrome alum in weak solution also answers well, and has less tendency to form insoluble compounds than ordinary alum.

There are other causes which work to produce a dirty or matt surface, and one of the first that strikes us is the use of an old fixing bath, in which there is frequently held suspended a considerable proportion of insoluble sulphide of silver and other impurities. These become attached to the surface of the negative, and, unless removed by friction, the only available method in the case, give the dried negative a distinctly granular appearance. Mercury intensification is another infallible cause of matt-surface negatives, unless the system we have recommended is adopted; indeed, negatives so intensified, can generally be identified by their appearance.

If the final treatment of a negative before drying be to submit it to gentle friction in the manner described, the result will be invariably more satisfactory, especially when the negative has to undergo retouching.

Value of Paintings.—Some little while ago, it will be remembered, we alluded to the small amounts for which some "Old Masters" had been disposed of at a public auction, and the depressed state of the picture market generally. At the recent Adrian Hope Sale, the total amount realised was a little short of 50,000*l.* This sounds a large sum, yet it is between 20,000*l.* and 25,000*l.* less than some dealers estimated would be obtained. Since then, another sale of valuable pictures has taken place, and although some sold for large sums, the amount realised for the majority of them was very much less than they would have made a few years ago. We have been given to understand that Continental firms who make a speciality of reproductions of paintings by photogravure have been able, this year, to buy the copyrights—and the paintings themselves—of pictures, in the various exhibitions now open, at a much lower rate than usual. How is this to be accounted for, seeing that Art, and Art Culture, is spreading in all directions?

Another Polar Expedition.—The English Polar Expedition, organized by Messrs. Jackson and Harmsworth, which leaves London this week, is one, from a science point of view, that will compare most favourably with any of those now in the arctic regions. Every branch of science seems to be well represented in the number of gentlemen that will accompany the expedition. Photography, of course, will be a prominent feature, and Mr. J. F. Child will act as photographer and also as mineralogist. The expedition will be away, like the other arctic expeditions, for some years, and it will be interesting to learn how plates and films, particularly the latter, behave, so far as keeping qualities are concerned, under extremes of cold. We have heard a good deal, from time to time, about the latter's behaviour after a time in hot climates, and it can be well understood that the heat might cause an evaporation of some of the volatile matters in the film; but in the arctic regions these conditions are not likely to obtain, and it will therefore be instructive to see how films will preserve their qualities when they are not subjected to anything but a cold or moderate temperature.

Defective Hand-Camera Pictures.—On several occasions during the past year or two we have directed attention to an unsuspected, by some, cause of fogginess or lack of brilliancy in hand-camera negatives, namely, an accumulation of dust upon the surfaces of the lens. There are, however, often other unsuspected causes that may considerably mar the brilliancy of hand-camera negatives, particularly those taken with the magazine form of apparatus, namely, the polish produced by wear on the working parts, which reflects or diffuses the light admitted by the len Shutters working between the lenses, or within the camera, som times become denuded of their blacking, and thus prove a source mischief. The iris diaphragms, too, are very prone to becon bright and polished, and thus conduce to want of brilliand in the negative in the same way as an unblacked stop would d Too much attention cannot well be bestowed on these apparentl trivial matters by those who aim at the best results. Frequentl more care in this direction would be the means of securing a high standard of negative than is possible with the present state of som workers' apparatus.

Photographers' Holidays.—As will be seen by a letter i our last issue, the photographers of Greenock have agreed amongs themselves—not for the first time—to close their establishments fo a week. This will permit the *employés* to have a clear week' holiday, and the employer to have one too, without any materia pecuniary loss. We are not aware that anything of this kind ha been carried out, or even attempted, in any other town. The *entent cordiale* existing between the professional photographers of Greenoc stands out in strong contrast with the feeling amongst those o many other towns we could mention, though competition is equally as keen in the Clyde town as it is in the places we have in our mind A weekly half-holiday amongst photographers has frequently been mooted, but never carried into effect, except, perhaps, in one or two instances. The general reason assigned on a canvas has been that more business is done during the half-holiday time than at any other, as people then avail themselves of their opportunity to sit for their portraits. But there is no reason why photographers should not fix upon some other and more convenient day for their holiday. A half day's relaxation from work is always acceptable to *employés* whichever day of the week it may be.

Photographs of Flames.—At the last meeting of the Physical Society, Captain Abney, before exhibiting his *Photographs of Flames*, demonstrated that a candle flame contains solid particles by passing a beam of polarised light through it, the track of the beam through the flame being clearly seen in one direction, whilst in a direction at right angles it was practically invisible. The same thing was also shown by passing the light through a turbid liquid. Photographs of Argand and candle flames, with pencils of sunlight and electric light passing through, were then exhibited, showing similar phenomena. Several series of photographs of flames of candles, and various forms of gas burner, taken with diminishing exposures, were then shown in order to illustrate the different luminosities at different parts of the flame. Those taken with long exposures showed the bright parts nearly equally white, but, as the time of exposure diminished, only the most luminous portions were recorded on the plate. From the photographs the author concluded that, when used with a slit as a photometric standard, the Argand burner was unsuitable, for portions of different luminosity came into view when the slit is approached or receded from. The ordinary fish-tail burner was better in this respect. Questions were asked and remarks made by Professor S. P. Thompson, Professor Perry, and Mr. Trotter, in reply to which Captain Abney said drop shutters, with slits from one inch to one-sixteenth of an inch wide, had been employed, and some of the exposures were only a few thousandths of a second. The displacement caused when the object was not stationary could easily be allowed for when the velocity of the shutter was known.

Toning Difficulties.—Complaints have been pretty numerous of late of difficulties in toning albumenised paper prints, both on ready-sensitised paper and that of home sensitising. The general complaint is that the operation is very protracted, takes an unusual quantity of gold, and in the end the tones are far from satisfactory. In many instances the recent hot weather may be traced as, indirectly, the cause. If paper is abnormally dry at the time of printing, a difficulty will be experienced in the toning, though less with ready-sensitised paper than with that sensitised at home. With

the heat the paper becomes dry and crisp, and the printing frames, and their pads, unusually dry and absorbent. As a result, the paper takes a different tint in printing, tones with difficulty, and does not yield a good colour in the end. We are now alluding more particularly to paper sensitised by the user. The remedy is to place the pads of the frames in a cool place—say a cellar—after the day's use, where they can absorb a little moisture, and to take care that the paper is not over-dried and made crisp. With ready-sensitised paper we have noticed that some samples have been unusually acid of late, probably made so with the view to enhanced keeping qualities during the hot season. The best remedy we have found when this has been the case is, after washing the free silver out of the prints, to soak them in a very weak solution of carbonate of soda for a few minutes, and then rinse them in water prior to putting them in the toning bath. As to the strength of the soda solution, a crystal of common washing soda the size of a small walnut in a quart, or three pints, of water will suffice.

Captain Abney on Science and Art.—Captain Abney, who is Director for Science to the Science and Art Department, South Kensington, made the following observations on science and art in a recent address to the students of the Municipal School of Science and Art at Banbury. He stated that he had often been asked whether he did not think that science and art were unhappy in being locked together in the department which he represented. That question sometimes was a hard one to answer when looked in the face. He proposed to look it in the face with them that evening, and show them where the difference lay between the two. What was science? It was observation. There were three stages: the observational, the empiric, and practical. It might be said that science was founded on observation, and it was only by observation that they could build up any scientific theory whatever. Art was just in the empiric stage; it was founded principally on observation, on what met the eye. To meet that, the artist was just as amenable to the laws which governed his nature as the locomotive. He had to obey those laws in everything. He had to look for his view. He had to think deeply, and when one thought deeply he was expending something. What was that something? It was a certain amount of energy. The locomotive went along the rails. What made it go? They might answer coal. Coal was vegetation once, and was developed by the aid of sunshine; so, in effect, it was sunshine, or rather the energy of the sun in the coal, which made the locomotive go along the rails. They saw, therefore, that the artist and scientific man were both in the same category, and he thought it was the business of the scientific man to inquire into the business of the artist, and he thought they were well bonded together. He hoped he had given them a reason why he thought science was most properly linked with art, and why a scientific man might be an artist, and an artist a scientist.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

DUBLIN MEETING.

Monday.

The ninth Annual Meeting of the Convention, now taking place in Dublin, gives token of being one of the most successful of these gatherings yet held.

Last Saturday and Sunday large numbers were arriving by every train and steamer, and at an informal gathering in one of the large rooms in the Hôtel Métropole (the Convention headquarters), on Sunday evening, it was found that there were well on for a hundred ladies and gentlemen present who had arrived from various parts of England, Scotland, and Wales.

The business meetings, exhibition, and general muster-place are centered in the rooms of the Photographic Society of Ireland, 35, Dawson-street, and on Monday forenoon the place was crowded by applicants for tickets for the dinner, the excursions, and the various places thrown open to the members during the week.

The weather, we are sorry to say, does not give immediate promise of being all that photographers could wish; for, although it is bright at intervals, these intervals are short, and the camerists wisely carry umbrellas along with their camera stands. But high spirits prevail, and, as we write, numerous parties are drivng out to see the city.

Some gloom pervades the members on account of the enforced absence of the retiring President, Mr. George Mason, of Glasgow, whose presence has proved such a "sparkler" to all previous meetings. He has recently been, and still is, ill, at one time dangerously so, and his medical attendant forbids his leaving, or even moving about, his room. The crisis is now past, we are glad to know, and convalescence will rapidly ensue.

The Arrangements for the Week.

The programme and guide-book of the Convention, issued under the editorship of Messrs. F. W. Crossley and J. A. C. Ruthven, contained several maps and illustrations of notable views, together with a mass of archæological and other information which was found of great assistance by the members during the various excursions.

The following is a complete synopsis of the official arrangements:—On Monday the Convention was opened, and the presidential address delivered in the Royal Dublin Society's building, Kildare-street. An hour later—at 8.30 p.m.—there was a conversazione, largely attended by the fashion of the city, in the Museum Buildings. The band of the Royal Irish Constabulary attended. No excursions took place on the opening day, but on the next day (Tuesday) the members of the Convention were afforded the opportunity of an excursion to the Boyne, Monasterboice, the Mellifont Abbey, the leaders being Dr. Cosgrave and Mr. J. L. Robinson. At Drogheda, at 4.30 p.m., there was to be a tea luncheon in the Whitworth Hall, Drogheda, the train returning from that place at 6.5 p.m. At eight p.m. on Tuesday, at 35, Dawson-street, papers are to be read on *The Uses of Photography in Medicine*, by Mr. A. Pringle, F.M.R.S.; on *The Effect of Temperature on Photographic Sensitiveness*, by Dr. Joly; and on *An Unexplored Field of Photography*, by Mr. T. C. Hepworth, F.C.S. On Wednesday, 11th, the annual general meeting of the Convention was to be held at 35, Dawson-street, at ten a.m., followed by a meeting of the general committee at eleven o'clock. At noon the Convention group to assemble on the Duke's Lawn, where they were to be photographed by Mr. A. Werner, of Grafton-street—size, 18 inches by 15 inches. The Lord Mayor's garden party at Killiney was to be held from three to six o'clock. In the evening the Convention dinner was to take place in the Ancient Concert Rooms, Great Brunswick-street, the music being supplied by a string band. On Thursday the excursion was to be to Howth Hill, the leader being Mr. John A. C. Ruthven. At 8.30 p.m., on the same day, papers are to be read at 35, Dawson-street on *Colour Photography*, by Dr. Joly, and on *A Photographic Sextant*, by the same gentleman.

The following are the arrangements for the two concluding days of the Convention:—On Friday, there will be an excursion to Bray, the Dargle, and Powerscourt, the leaders being Messrs. J. H. Hargrave and W. Lawrence. The train will leave Harcourt-street Station at 10 a.m. Cars will be provided at Bray, and luncheon at Powerscourt Waterfall at 2 o'clock. The Castle and gardens will be opened to the Convention, and the train will return from Bray, *viâ* Kingstown, at 6.30 p.m. There will also on this day be an excursion to Trim and Bective, the leader being Professor Grenville Cole. The train will leave Broadstone at 9.30 a.m., and arrive back at 5.5 p.m. This excursion is exclusively antiquarian, and will only be arranged if fifty or upwards go. In the evening, at 35, Dawson-street, a paper will be read on "Recent Progress in Astronomical Photography," by Mr. A. Taylor, F.R.A.S. Perhaps the most enjoyable of all the excursions will be that of Saturday, 14th inst., the concluding day of the Convention, when the members and their friends will leave Harcourt-street at 10 o'clock a.m. for an excursion to Glendalough and the Seven Churches. The party will be divided, one portion leaving the train at Rathmines, proceeding on cars to Glendalough, and thence to Rathdrum Station, where they will join the return train at 8.24 p.m. The second party will travel from Rathdrum through the delightful Vale of Clare to the Churches. Dinner will be served at the Royal Hotel, Glendalough. Sir Thomas N. Deane has kindly consented to give an address descriptive of the

archæological remains at Glendalough. This excursion has been arranged for Saturday, in order that the members who may desire to view the lovely scenery of the Vale of Ovoca, as well as of other parts of scenic Wicklow, and who may be able to stay over Sunday, may do so.

In an article welcoming the Convention to Dublin, the *Irish Times* had the following remarks:—"The art of Photography has made great strides in Dublin during recent years. Not one but many public studios are now producing work which not merely can compete with, but vastly excels, that done elsewhere. The amateur also, with his portable camera, is ubiquitous, and some of the daintiest pictures that an artist photographer could desire to see are the result of his workmanship. The papers to be read at the Convention will, we have no doubt, prove of universal interest. With Sir Howard Grubb as President we shall probably hear something new regarding the latest developments of stellar photography, now recognised to be a most important science as applied to the uses of astronomy. The camera has made discoveries in the heavens which have eluded even the telescope in the most practised hands, and it may be that we are only upon the threshold of a new survey of the star space. The citizens of Dublin will bid very cordial welcome to their guests, and we are sure that they will have no reason to complain of any lack of friendliness and hospitality."

Opening of The Convention.

Monday was largely devoted by members to driving around and about the city, facilities for which were afforded by numerous cars generously placed at their disposal. Among the places rather extensively patronised was Messrs. Guinness's Brewery, whose special article of manufacture was duly "sampled."

The proceedings in connexion with the Convention were formally commenced in the Library of the Royal Dublin Society, Leinster House, Kildare-street. Mr. A. Pringle, a former President—in the absence, through indisposition, of the retiring President, Mr. George Mason—occupied the chair. There was a large attendance, including the Lord Mayor, Sir Howard Grubb, F.R.S., Messrs. J. Traill Taylor, R. Kidd, J. Stuart, Major Lysaght, J. L. Lyell, T. C. Hepworth, E. J. Appleby, Professor Bothamley, Dr. M'Weeney, Mr. and Mrs. Snowden Ward, J. B. B. Wellington, G. W. Webster, A. L. Henderson, A. Cowan, John Brien, John Howson, Conrad Beck, A. Deed, R. Tynen, R. Keene, William Crooke, R. P. Drage, A. Tate, A. Werner, Sir Charles Cameron, H. Sturmey, T. Carter, W. Taylor, F. W. Hindley, A. Seaman, F. A. Bridge, Dr. Liesegang, Baldwin, Thomas Fall, A. Webber, W. Scorer, Colonel Stewart, W. W. Naunton, M. J. Harding, E. Marlow, L. Berry, F. P. Cembrano, jun., and J. A. C. Ruthven, local Hon. Secretary.

The Lord Mayor, in welcoming the members, said Dublin was always anxious to show the beauties possessed by the city and its surroundings, and also whatever beauties existed in the neighbouring counties, to visitors, and to extend hospitalities to their friends from across the little streak which separated them from England. He welcomed them on behalf of the citizens of Dublin and the municipality of which he was the head, and he trusted their visit would be an agreeable one. He was sure they would find a good deal to interest them in the city and county of Dublin, the counties of Meath and Wicklow—in the scenery, ancient ruins and demesnes—especially for those who had never been in Dublin before. They would have abundant opportunities of "taking them off," and carrying mementoes of Ireland across the water. He congratulated them upon the fact that the weather appearances were now brightening. The Lady Mayoress and he would endeavour to make their visit to a pretty suburb of Dublin a pleasant one. He congratulated one of Dublin's most distinguished citizens upon the high position which he occupied as President of the Convention. There were many well-known works connected with him in the city, and they were extremely proud of having amongst themselves a citizen of his high position in art and science. He was sure, during the year of his Presidency, Sir Howard Grubb would add another laurel to those which he had already gathered for himself.

The Hon. General Secretary (Mr. Cembrano) read a letter from Mr. George Mason, retiring President of the Convention, regretting that he was unable to be present at the Dublin meeting, as he was indisposed, and forbidden to travel by his medical adviser.

The Chairman said he felt that it was unnecessary to introduce Sir Howard Grubb to a scientific meeting, for his fame was widespread. The fact of his being President, and also of the strong local committee which was gathered together, he had no hesitation in saying would raise their status, and benefit their position in years to come. In conclusion, he read a telegram from Mr. George Mason, the ex-President, wishing the meeting in Dublin success.

He then vacated the chair in favour of Sir Howard Grubb, the President for the year.

Sir Howard Grubb then took the chair, amidst applause, and delivered his inaugural address.

THE PRESIDENT'S ADDRESS.

In the early days of photography, a photographer never thought it worth his while to point his camera to any object that had not some particular interest connected with it. It might be a building having historical interest or architectural beauty, or it might be a well-known and favoured landscape, celebrated far and wide for its beauty; the aim, in fact, of the photographer at that time was to produce a representation or, we might say, a portrait of some particular object which had a special interest in itself; but what photographer of that time would have thought of wasting his plates (as it would have been considered) in pointing his camera at those little bits of moor or fen, or some nameless brook, out of which the modern photographer has produced his most exquisite pictures? I say pictures advisedly, because that is just the difference between the photographs of the present day and the photographs of the past. The superiority of the later efforts of photographers depended much more on the fact that, whereas in former time the photographer's aim was to produce a representation or a portrait of a particular scene, that of the modern photographer is to produce a picture.

A Fine Art (?)—Landscape Painting.

The question as to whether photography is to be considered as almost or altogether a fine art will not be settled by any arguments. Surely and steadily, however, it is establishing a place for itself, and, though every one who takes a Kodak under his arm and presses a button may not be an artist, yet no one can deny to some of the works which we see on the walls of some of our modern photographic exhibitions an honourable place among the fine arts. I have been sorry to see in criticisms on some of our more recent Academy exhibitions a tendency to attribute blame to photography for a certain decadence which is supposed to have taken place in the work of some of the landscape painters of late years. I have seen it stated that this lowering of the standard of work is due to the use of photography by the artists. That some landscape painters do use photography to obtain a permanent record or memorandum of some fleeting cloud or water effect, or for other legitimate purposes, is well known, and many have acknowledged with gratitude the value which it has proved to them in their work; and it is, I think, generally conceded that in many ways the influence of photography has been beneficial in ensuring a more faithful following of nature and in removing conventionalities which were formerly accepted as correct, but which photography has shown to be otherwise. In this world, however, there are few gifts which cannot be abused as well as used, and if, instead of using photography for one or other of the legitimate purposes referred to, artists will make a slavish copy of a photograph a basis for a picture, it is small wonder if their work is devoid of artistic feeling or individuality; but surely things ought to be called by their right names, and this is the abuse and not the use of photography.

Printing Blocks for Book Illustrations.

There is perhaps no branch of the photographic art which has shown more marked advance of late years than that of the production by photography of printing blocks for book illustrations, suitable for making up with ordinary printers' type. It is not so many years ago that the attempts to produce half-tones in such blocks resulted in a sort of all over dirty blot, out of the depths of which the dim outlines of a picture could be imagined rather than seen. Now we have illustrations for our books and magazines that rival the best engravings for beauty, while possessing all the accuracy of the original photograph.

The Stereoscope.

Referring to possible developments in the future, I was glad to see a reference made in the address of your president last year to what appears to be a revival of interest in the stereoscope. I would have been still better pleased if I had reason to think that this revival had received any

marked encouragement in the past year, and I can only hope that the address of your president for next year will chronicle some further steps in this direction. The stereoscope is an instrument which has always had a peculiar facination to me, and it may be within the recollection of some here that I made attempts a few years ago to revive an interest in it by devising some forms which did not possess all the disadvantages of those more usually employed, but I found at that time that all interest in the instrument had lapsed, and there was no possible chance of getting people to take photographs suitable for the instrument and consequently no use for the instrument itself. Many people have often expressed surprise that an instrument which is capsble of giving such exquisite results should have so completely fallen into oblivion, but I think the explanation is not difficult to find. The invention of the stereoscope came too early. It was in use at the time of the first rush of popularity of photography, and it lent itself so admirably to the display of the power of photography that it was immediately brought into use in connexion with it, and that at a time when the average photograph was a very poor example of art. It was an instrument that could be produced at an extremely small cost, and the photographs which were used with it, being necessarily of very small size, were also of an extremely cheap character, and the consequence was that the instrument was used for the very worst and lowest type of photographs, and it fell into disuse. Had the invention of the stereoscope been delayed some twenty years, when photographers learned to produce pictures and not mere photographs, it would probably be a favourite instrument at the present time. I believe the development of the stereoscope would be well worth your serious attention. If really good modern specimens of photographs were used with one or other of those forms of instruments which do not necessitate the use of extremely small size of pictures, I believe the result would be such as to almost certainly revive the popularity of the instrument.

Astronomical Work.

And now I would say a few words on a subject which I am myself deeply interested in, the application of photography to astronomical work. No doubt many that are here have from time to time learned something of this subject from the articles which occasionally find their way into the photographic journals, but very few, even those who are brought more intimately into contact with such work, have any idea of the debt which astronomy owes to photography for the helping hand she has held out to those who devote their lives to astronomical research. Before the adoption of the photographic method of star-charting, the position of every star had to be ascertained by a series of most elaborate measures made with the most delicate instruments. To make a catalogue of 10,000 stars was a good twenty years' work for a first-class observatory. Now, with properly corrected object-glasses, and properly constructed instruments to carry them, it is possible to obtain images of as many stars as this on one single plate, the position of which stars can be measured and recorded at our leisure afterwards. Records of observations by the old system were at best but written statements of the eye and ear observations of the observer, subject to all sorts of personal as well as instrumental errors, and open sometimes to the imputation of bias on the part of the observers. The modern observation is a photographic record, and absolutely free from all personal error or bias. Again, in visual observations, a certain size of telescope will enable observations to be taken of stars down to a certain magnitude, but not beyond. If it be desired to observe fainter stars, an instrument of larger aperture, and therefore more light-collecting power, must be used; but with the photographic method this is not the case. The effect on the photographic plate is a cumulative one; consequently, the longer the plate is exposed the greater number of star images will be found upon it, and, as a matter of fact, stars have been photographed with quite moderate sizes of telescopes which no human eye has seen with the very largest instruments in existence.

The Power of Photography.

Perhaps I may be able to convey some idea of the wonderful power that photography has become in the hands of the astronomer in this way. If our smallest coin, a threepenny-piece, be held up at arm's length, it will cover a portion of the sky of about one degree area. Suppose the stars visible to the naked eye to be evenly scattered over the sky, this threepenny piece would not cover even one single star. It would take about four to cover each star visible, but photographs have been taken of a similar area of the sky with as many as 10,000 stars distinctly visible on them. In fact, one well-known astronomer has declared that he believes that, if we only exposed plates long enough, we should find that there is no spot in the whole sky that has not a star upon it, and what makes it still more wonderful is, that that light which is concentrated on the photographic plate, that infinitesimally small amount of mechanical energy which sets in motion and shakes together the chemical constituents on that tiny spot on our plates, has travelled from so great a distance that it necessarily started on its journey before that time generally ascribed to the beginning of the world in order to reach our photographic plate and do its work for us here in this year of grace, 1894.

Spectroscopy of the Stars.

Again, take the case of photography as applied to the spectroscopy of the stars. With the older methods these observations were most laborious. The keeping of the star image steady between the jaws of a slit of about 1-500th of an inch wide, and the measuring of the various lines with the micrometer screw during the glimpses of satisfactory definition that were often few and far between, was a severe trial of the patience and skill of the observer; but now, calling in photography to our aid, how very different is the case. By applying a prism in front of the object-glass of a telescope the image of each star is photographed as a spectrum, with all its lines fairly measurable, and thus the spectra of hundreds of stars can be obtained on one single plate. Or, if it be desired to examine any of these still closer, a slit spectroscope can be used with a photographic plate at the focus, and even if the star image does dance about, as it is sure to do on all nights except the very finest, it is of no consequence, for, when it happens to be in the slit, the light energy does its work on the photographic plate, and, if it does move off the slit, no action takes place till it returns again, the only difference between a bad and a good night being that a longer exposure must be given in the former.

Every day new applications are made of photography to astronomical work. Methods have been devised, though not yet, perhaps, in a very practical form, for taking transits of stars by photography, and I believe that before the lapse of many years nearly all the work of the Astronomical Observatory will be conducted on photographic lines. You will, I am sure, pardon me for dwelling too long, perhaps, on this branch of my subject. The development of astronomical photography has occupied a large portion of my own attention for some years past, but I must not forget that amongst my audience I have those representing all classes of the photographic public, amateur, professional, and commercial, and it is very probable that little of what I have said may have any special interest to many here. A review, however, of the progress of the art in any direction, even though it may not be on the particular lines we have been working in ourselves, may be useful in showing that in photography, as in all other things, it is impossible to stand still. With everything else around us advancing with giant strides, this is impossible.

With increase of art culture and increased opportunities of studying all that is best in art, the public will not be satisfied unless your results also follow the same onward march; and probably nothing is likely to conduce more to this result than the encouragement of such societies as the Photographic Convention, which give facilities for free intercourse and exchange of ideas between members of the same craft living at a distance from one another, and give these facilities, I think, I may add in such a pleasant form. I trust, therefore, that each succeeding meeting of the Convention may exceed in interest all its predecessors, which, so far as the present is concerned is equivalent to saying that I hope that this Dublin meeting may be the most successful of all the meetings of the Photographic Convention.

On the motion of Mr. Bothamley, seconded by Mr. John Stuart, of Glasgow, a vote of thanks was passed to the President for his address, and the proceedings terminated.

Conversazione at the Museum.

At the conclusion of the meeting a most enjoyable conversazione in honour of the members of the Association was held by permission of the Lords of Committee of Council on Education in the Science and Art Museum building. A large and fashionable gathering, including numerous ladies, attended in response to the invitations issued by the local committee, and the guests were received by Sir Howard Grubb, President of the Convention, and Dr. Ball, Director of the Museum. The appearance of the interior was brilliant and animated, and the handsome premises, with their magnificent collection of rare curiosities, appeared to best advantage under the electric light. Couches and easy-chairs were interspersed in suitable positions, and the arrangements for the comfort of the guests could not have been better. The inspection of the exhibits elicited intense admiration, and a musical promenade was enjoyed to the choice selections played by the band of the Royal Irish Constabulary. The

examination of some of the most attractive treasures must have caused mortification to many a visitor that neither the considerations of favourable exposure or of the etiquette bearing on the occasion would allow the opportunity of a tempting snap-shot. Refreshments were served in the side halls, and the function proved very agreeable from every point of view.

The following was the programme of music discoursed by the band:—Gavotte, "Welcome," Kluss; valse, "Al Fresco," M'Alinden; overture, "Domino Noir," Auber; piccolo solo, "Mazurka de Concert," Ritter; fantasia, "On Ancient Irish Music," Van Maanen; intermezzo, "Lion du Bal," Gillot; selection from Gounod's "Faust," Van Maanen; polka, "Friendship," Muth; selection, "Hibernian Bouquet," Kappey. "God save the Queen." Conductor, Mr. Van Maanen.

Tuesday.

The first of the various excursions took place on Tuesday, when a large party went to Boyne, Monasterboice, and Melifont, by special train to Drogheda, under the leadership of Dr. Cosgrave and Mr. J. L. Robinson. The return journey was made in time for the meeting in the Society's rooms, 35, Dawson-street.

This excursion was a great success, the attendance reaching the handsome total of 120.

In the evening the following papers were read:—*The Use of Photography in Medicine*, by Mr. Andrew Pringle; *The Effect of Temperature on Photographic Sensitiveness*, by Dr. Joly, and a paper on *The Vertical Camera*, by Mr. T. C. Hepworth.

Wednesday.

This morning it was ascertained that the total membership of this year's Convention had reached the capital total of 270. Dublin, therefore, has well beaten the record in numerical sense.

At the usual meeting, held in the forenoon at the Council Room, 35, Dawson-street, it was decided that next year's Convention will be held at Shrewsbury.

The Convention group was to be taken on Duke's Lawn at midday. With the JOURNAL for Friday next, July 20, we hope to present our readers with a collotype reproduction of the group, together with a full account of the rest of the week's proceedings.

So far, the Dublin Convention of 1894 must be set down as having been remarkably successful.

THE EXHIBITION.

THE Exhibition room is large and well lighted, and is situated behind another, which might very well serve a similar purpose under less imposing circumstances. On entering, we are confronted with a stand of magnificent proportions containing the exhibits of Mr. Thomas Mayne, who, having some time since retired from Parliamentary duties (he was member for Tipperary), has devoted himself to the disseminating of apparatus and appliances generally, making, so far as we can see, a speciality of magic lanterns and slides, of which he carries a large stock. His case contains a varied selection, including telescopes, hand and stand cameras, educational and other projecting lanterns, saturator and ordinary limelight burners, albums, binoculars, and other optical apparatus.

The display of Werner & Son is comprehensive and of unusual excellence. It consists mainly of large direct portraits. The perfection attained by this firm is evidenced by a full-length figure of a lady printed from a direct negative 64 × 38 inches, and is quite unretouched. Being hung on the line, one has an opportunity of examining its technical excellence. The smaller, although still large, portraits (thirty inches), of Her Grace the Duchess of Leinster, Lord Houghton, Prince Edward of Saxe-Weimar, Sir Howard Grubb, and others, all display a master's hand in lighting, posing, and technique.

Messrs. Lafayette, too, exhibit largely. The most imposing of their pictures is one emblematic of *An Evening Zephyr*, in which a beautiful female figure (life size) is represented as moving through space, a terrestrial scene beneath her. The theme is illustrative of Tom Moore's lines:—

"Hark! 'tis the breeze of twilight calling
Earth's weary children to repose;
While round the couch of Nature falling
Gently the Night's curtains close."

The picture is a combination of red Autotype and hand-applied red chalk.

More realistic, however, and not less pictorial, is a series of six groups (if the term "group" may be applied to two figures) illustrative of love scenes in the lives of a Venetian fisherman and his sweetheart, a girl with whom any one may well be excused for falling in love. Both the figures and the scenic surroundings are highly artistic and natural. The former are carefully posed to suit the special subject, while the latter are sketched in by the artist's brush or stump. Other six pictures of a similar nature, the chief actors in which are in a higher walk of social life, are executed on lines similar to those of the fisherman series. We believe that these will still further enhance the reputation of the Lafayettes, of whom there are two residing in Dublin. They also exhibit many other portraits of the class with which their name is so well associated, but which time and space do not permit of our enlarging upon.

J. Robinson & Sons show some excellent direct portraits, large in dimensions and unaffected in pose. At the time of our visit neither numbers nor names having been attached to the exhibits, we cannot specify any individual pictures.

The Eastman Company come out in quite a new *rôle* by the exhibition of a number of exquisitely painted portrait specimens, finished in water colours by M. & T. Scott, Edinburgh. They are enlargements on Eastman's platino-bromide paper, which seems to lend itself admirably to the reception of colours. These are from negatives by Warneuke, of Glasgow; Coe, of Norwich; and Shaw, of Huddersfield. There are, of course, numerous uncoloured photographs, including enlargements on the Company's bromide paper from negatives by Whitlock, of Birmingham; prints on white and toned Solio papers, on their Nikko paper, together with collections of Kodak work both direct and enlarged. Altogether, the Company's exhibits are the most comprehensive they have yet shown.

Mr. Conrad Beck, of R. & J. Beck, at the time of our visit, was unpacking a choice collection of Frenas, Frena pictures, and other Frena and optical appliances, and it is astonishing to what a degree of perfection this instrument has been brought.

Messrs Watson & Sons likewise were busily employed in "clearing the decks" for a large display of the photographic and lantern goods with which their name is now so well associated.

Some exceedingly lovely pictures of Norwegian and Scottish scenery were exhibited by the Hon. Local Secretary, Mr. J. A. C. Ruthven, whose *Kilchurn Castle on Loch Awe* is, undoubtedly, the best photograph of that stronghold we have seen.

Very fine pictures were also contributed by Messrs. Louis Meldon, A. E. Gordon, Robert R. Livingston, and R. M. Inglis.

His Grace the Archbishop of Dublin exhibited a collection of photographs he had made of Swiss views in 1855.

Mr. J. Robinson, Grafton-street, has a show case well stocked with cameras, shutters, lenses, and photographic sundries; Messrs. Curtis Brothers, too, have a similar display.

The stalls of the Eastman Company and of Messrs. Watson and Son fairly groan under the plethora of their newest and choicest articles of manufacture.

Taken all in all, the exhibition of both pictures and apparatus forms a singularly good one.

DAYLIGHT TISSUE AND ITS ADVANTAGES.

[Autotype Notes.]

Now that the new Daylight Tissue is on the market, a few words about it may possibly be acceptable from one who has had many years' experience in the practical working of the carbon process and demonstrating it to others, and therefore is fully aware of the little troubles that are sometimes met with, under the usual system of working, where the process is not in constant every-day practice. In the first place, I take leave to congratulate Mr. W. White on the simplicity and utility of his invention, and photographers generally that the Autotype Company have acquired his patent rights, as they now have the assurance that the material supplied to them will be of the highest quality. By the way, is it not somewhat a reproach to carbon printers that the thing was not thought of years ago? Some of us must find the cap fit them, I fancy—I can answer for one.

The great stumbling-block with beginners in the carbon process I

found, when so much of my time was spent in tuition, was the drying of the tissue, so as to have it in a good working condition, where there were no suitable arrangements for the purpose. Indeed, it used to be said that the only real difficulty in the carbon process was the drying of the tissue. I allude to this matter merely the better to emphasise the present improvement. It is true the drying difficulty with amateurs and small workers has been greatly avoided since the Autotype Company commenced to supply tissue in small quantities, ready-sensitised, and thus rendered the carbon the simplest of all printing methods. When the tissue is sensitised, it involves the use of no chemicals but water and alum; indeed, the latter is not necessary, so far as the fixing of the image is concerned; and, what is more, with the new tissue, all the operations, throughout the whole of the work, can be carried on in broad daylight.

The tissue, as sent out ready-sensitised, is specially adapted to suit negatives of an average type; but, as I pointed out in a previous article (see the issue for January), great advantage would often accrue from its being sensitised specially to suit the negatives when they are of an abnormal character, excessively soft, or hard, ones for example. This is one of the cases where the new tissue will be found so very advantageous. It can be quickly sensitised, and, as no special drying arrangements are necessary with it, the tissue, after sensitising, can be put anywhere to dry. Again, those photographers who at present only employ the carbon process for their large or for their special work often require but a few sheets of tissue at a time, and have no convenient drying place, will find it a boon. Although they can procure the tissue ready for use, that sometimes involves taking more than is required for immediate use. Indeed, I much question if those who sensitise their own tissue will henceforth use any other, for all that has to be done with it is to immerse it in the bichromate bath, squeegee it upon any smooth, opaque, or non-actinic material, the surface of which has previously been French-chalked, and allow it to dry. I need not remind readers of the *Autotype Notes* that carbon tissue is, to all intents and purposes, insensitive to light while it is wet.

There are many suitable materials to choose from for squeegeeing the tissue upon, such as ebonite, xylonite, tin, zinc, or ferrotype plates, even the bottom of an ordinary porcelain dish might be used on a push. On the whole, perhaps, glass is the best. Non-actinic glass is expensive, but a sheet of ordinary glass will answer quite as well if one side of it be coated with black varnish, or it may be coated with a weak solution of gelatine and a piece of sensitised carbon tissue squeegeed upon it, allowed to dry, and afterwards exposed to light through the glass. The gelatine then becomes insoluble, and thus the glass will serve for all time—well, say until it meets with an accident.

It is a common practice now to dry tissue in contact with a glass plate, and this method of drying possesses many advantages. The most generally recognised one is that the tissue is smoother than when it is dried in the usual way, so that better contact with the negative is secured. This is but a minor advantage as compared with some others. For example, the surface of the pigmented gelatine, which composes the image, is effectually protected from injurious vapours, which might produce an insolubility layer, and so cause the delicate high lights of the picture to be tinted. It is also secured against dust at all stages of drying. With the new tissue, the drying can be perfectly controlled, for, if it is found to proceed too slowly, which might produce insolubility, the plate, with its adherent tissue, can be transferred to a drier situation, say in the draught of an open window, for example; or, if too quickly, it may be removed to a less dry atmosphere.

There is a point in connexion with drying tissue in contact with an impervious material which is not an unimportant one as affecting the working qualities of the tissue itself. The evaporation takes place from one side only, that is, through the paper support. The longer carbon tissue remains moist, the less soluble it becomes. Now, that portion which is in contact with the glass, the one that forms the picture, of course remains moist the longest, and therefore may be expected to prove less soluble than that nearest the paper, the part that has to be washed away in the development. That is precisely the best condition for tissue to be in, because it will hold the delicate tints of the high lights better than if it has a very soluble outer layer, which often happens when the tissue is dried in the usual way, particularly if it has been dried too quickly and used soon afterwards.

One need not dilate on the advantage and comfort of being able to carry on the whole operations of any photographic process in broad daylight. This can now be done, from first to last, with the carbon process by using the new tissue. While it is wet, at any stage, it is practically not sensitive to light. While drying, the sensitive surface is completely protected from light by the glass or other plate on the one side and its non-actinic support on the other. When dry, it can be manipulated in the light of an ordinary room if the paper side is kept upward, then the pigmented coating is quite protected by its non-actinic support.

E. W. Foxlee.

LETTERS TO A YOUNG PHOTOGRAPHER.—I.

My Dear Richard,—I have received the negative. You say that it is a first attempt, resulting from a study of all the books on photography that have been published, and you ask me my candid opinion of it, together with my advice as to the best printing process for which it is adapted. Allow me, first of all, to compliment you on the thoroughness with which you have prosecuted your study of photographic books. I myself have read but a few of them, with the result that, lest I should be in peril of forgetting or obscuring what little information I have derived from them by a surfeit of such profound learning as the others seem to contain, I do not intend to read any more. With your negative to guide me in counselling you upon the same subject, I am of opinion that you, too, could have afforded to place an earlier limit to your appetite for photographic wisdom.

In one respect at least, my dear Richard, your negative does you much credit. As a beginner in photography, you have wisely recognised that the art of selecting subjects suitable for camera treatment must be built up on the surest, and, at the same time, the humblest, foundations, and so you have sagaciously elected to expose your first plate on what appears to be a brick wall and a rabbit hutch. I say "what *appears* to be a brick wall and a rabbit hutch" advisedly, because an intimate acquaintance with the philosophy of the very newest photography as it appears on the walls of some of the Exhibitions, persuades me that it demands a supremely keen judgment and analysis to always arrive at the meaning and intention of the artist as set forth in his work. Now, as it is conceivable that I do not possess the depth of critical acumen I am here describing, your negative possibly represents, both to yourself and to more artistic instincts than mine, a bit of Bruges or of Chester, or an evening view of Hurstmonceaux, or some other equally poetical subject. I, however, in my incurable philistinism, am unable to dissociate it from the mild suggestion of a brick wall and a rabbit hutch, though, mind, this, if unfortunate for me, in no way diminishes the esoteric art qualities that the picture may, in some eyes, possess.

But it is to the technique of the negative that I am to direct your attention. You do not appear to have quite levelled your camera before making your exposure, the consequence being that the subject is not squared with the plate. This is a defect, however, that can be remedied by a judicious trimming of the print. It seems also, from the duplication of the lines throughout, that you must have shaken the camera at the moment of exposure. Most of us, I may tell you, have a predilection for only one view of one subject on one plate. Still, even this defect, together with the lack of sharpness (or rather diffused focal treatment) with which you have preferred to invest your subject (you evidently have an ambition to appear on the line at the Salon) may be nicely got over by the choice of a rough-surfaced printing paper, which has the one merit of obliterating superfluous details. Indeed, from this point of view, your negative is about as good as it could be. You are evidently out of sympathy with pretty negatives having a tendency to clear glass in the shadows, as yours has a universal surface veil, called "fog" by vulgar professionals and ignorant amateurs, which is calculated to give increased softness and harmony to the print. If, however, you should care at some future time to produce negatives having the occasionally useful property of freedom from veil, I shall be happy to give you the necessary instructions for making them.

There are several transparent circular spots in your negative which will require to be touched out before you proceed to print it, and to the same end means must be taken to reduce some opaque marks in the sky which are denser than the surrounding portions. The whitish deposit on the glass side of the film suggests that the plate was not thoroughly fixed, and the crystalline and slightly aqueous layer on the film is indicative of an incomplete washing after such fixation as the negative had. The presence of these trifling defects in the negative assures me that you must have studied your books to some purpose, otherwise the negative would scarcely be in the remarkable condition in which I find it. Some beginners at their first attempt get nothing at all on the plate; you are to be congratulated on getting much more than the average amount of deposit on *yours*.

As to the development, perhaps a little greater density would have been obtained if you had used more pyro, though, happily, what the plate lacks in this respect it gains by the addition of the veil (or fog). Negatives so deeply veiled as this is render it a little difficult to indicate precisely the errors of development and exposure, especially when, as is the case with yours, by holding the picture up to strong sunlight, it is barely possible to see through it. There is, nevertheless, a compensating advantage in the circumstance that the negative does not require intensification. On the other hand, I am positive that it could not be improved by reduction. Believe me, this cannot be said of many negatives. On the whole, my dear Richard, considering the source of instruction you

went to, I am inclined to take a distinctly hopeful view of your photographic future. Send me some more "results," and I shall be pleased to criticise them as fully as I have done this negative, which I herewith return.

Yours truly,

JUNIUS JUNIOR.

P.S.—Why print it? Why vulgarise a subject to which no printing process known in modern photography can possibly do justice?

PHOTOGRAPHY IN COLOURS.*

A ROUGH but good way of testing your red screen, which is possibly the most difficult, is by looking at a coloured chart through it; blue should look black, and green of a grey or orange-grey, and it is as well to work always with a colour chart at first. For instance, suppose a commercial house have to reproduce a sketch or drawing done by an artist; if possible, the artist should supply a rough chart of the colours used, or, if this is impossible, a red, yellow, and blue should be matched as near as possible, and paper bearing patches of these colours photographed side by side with the picture.

There is one caution I must add, and that is with regard to judging of screens or colours by visual examination alone; this method is absolutely unsafe and untrustworthy. Take, for instance, rhodamine solution, even as strong as 1·100 it allows a very considerable amount of violet blue to pass; again, another dye which I have tried, which is a very fine orange, permits considerable quantities of blue-green to slip through, though optically this cannot be detected.

I have brought a spectroscope down here, and, if after the lecture any one wishes to examine my screens, they are quite at liberty to do so.

It was stated at the Camera Club Conference the other day that both Vidal and Vogel affirm that it is perfectly immaterial through what screens the negatives are made. I was very doubtful at the time, and I have made careful search through almost, if not all, papers by these gentlemen that have been published, and M. Vidal has sent me some pamphlets which have not yet been published, and nowhere can I find such a wild statement; if it was true, it would mean that we could make three negatives through three blue glasses and get perfect results, an obvious absurdity.

Methyl violet and ethyl violet have also been suggested for screens; ethyl violet is a trouble to get, but it is far better than the other, and its spectroscopic examination at once proves this. There are a very large number of dyes which can be used for screens, and I believe the Photographic Society of Great Britain will publish in their journal a series of absorption spectra of about 300 dyes from which choice could be made, and any dyes can be used so long as they answer to the requirements of giving negatives which correspond to the Clerk Maxwell colour sensation diagram.

Mr. Ives, as you are aware, uses a camera with one lens, and obtains his three negatives on one plate. The camera is a triumph of ingenuity and mechanical skill. It is obvious to all of you that the red negative requires far longer exposure than the yellow, and the yellow a longer exposure than the blue. Now, as Mr. Ives uses only one lens, it is obvious that he cannot equalise the exposure by varying lens apertures, so he utilises most ingeniously the reflection from glass and silvered glass. There seems to me to be possibilities of still further modifying the light by using different coloured media for reflection, for instance, a gold surface instead of silver, and so on. Mr. Ives's method of obtaining the negatives on one plate has one great advantage, there is no trouble about registration of the images afterwards for any work, but it has also a disadvantage. Mr. Ives, as you know, has abandoned the idea of using heliochromy for printing surfaces, confining his attention to projection. Now, there are others who wish to produce three-colour prints, and for this purpose Mr. Ives's camera presents disadvantages. The negatives are very small, and would entail enlarging for printing work; it could, of course, be made larger, but it means a big waste of plate, because I fancy that to obtain three whole-plate negatives we should have to use a plate 26 × 18, and, if it increased in proportion, to obtain larger negatives, the size of plate and camera would be enormous. Mr. Ives's camera is not yet on the market, although he has, I believe, placed the photo-chromoscope. This rather seems to me to be putting the cart before the horse, but everybody knows his own business best.

Ives has been so successful in his researches that he now employs merely special glasses which enable him to obtain on one plate—an Edwards's isochromatic—all his negatives. I might add that I have begun working with glasses, but the difficulty of finding glass to answer the requirements is enormous. Somehow a large glass-manufacturer has an objection to your going through his stock, taking up an hour's time, then buying, say, three pieces only four inches square. He can't have the impudence to charge you more than a shilling for this lot, and it's poor business.

With regard to exposure, I may say that this varies, of course, with the intensity of light, but that I have found that, using the Lumière plates and screens mentioned above, the exposure is sixteen for the red, six for the yellow, and one for the blue, and that the ordinary plate and the methyl violet screen requires just three times the exposure that the same plate would require without the screen.

There is one point, in focussing it is advisable to use the aperture with which the exposure is to be made, and not to focus with full aperture, or a want of definition may be detected; further than that, it is advisable to use registration marks the same as a lithographer does to ensure getting the images the same size.* For development I have found that metol or eikonogen is better than pyro, which is apt to give false values to the high lights.

Now let us insert in the lantern the positive from the red negative; the shadows in this positive are covered with a deposit of silver which stops the red light out, leaving only yellow and green. With the green the slide stops out the green and leaves blue and red; with the blue the slide only allows green and red to pass. If we project on to the blue, the green, and then the red, we get a near approach to white. I might add, that to get pure white light we want the electric light, and that the slightest variation in these lights, the limelights, alters the tint.

It has been denied, and I believe one or two gentlemen who are sceptical on this point are present here to-night, the possibility of making white light by the admixture of three lights. I will ask Mr. Beard to kindly throw a disc on to the screen, without using any slide or colour screen. I will hold in the light a sheet of blotting-paper, because our screen is not quite opaque; it looks white, not a pure white, because limelight is distinctly yellow. I will now ask Mr. Beard to shut down all his lights, insert the coloured glasses, and then turn up all three lanterns at once, and we get, I think, a very good white. I have no hesitation in saying that with the electric light this would be quite white. Mr. Beard will now please project the red only, and I am going to show you that we can run through practically the whole spectrum by these three lights. We have here red; gradually mixing the green with it, we get orange and yellow; now, lowering the red light, we get yellowish green, and finally green, and mixing violet with this we get greenish blue and blue; now, lowering the green, we run through dark blue to violet.

You can understand now how it is we can obtain perfect results when we have three perfect negatives, for, as every colour in nature must be derived by a splitting-up of the spectrum, or by admixture of one or more spectrum rays, we can simulate any coloured object.

The late A. W. Scott, of Weston-super-Mare, writing in one of the almanacs for 1891, says: "One September evening in 1889 I was seated in a certain chapel in Weston, vainly trying to hear the discourse, when a peculiarity in the pulpit attracted my attention." Personally, I must say this sentence seems to me to be involved; it leaves it an open question whether the peculiarity was animate or inanimate, and is a possible reflection on the preacher. However, Mr. Scott goes on to say this peculiarity gave him the key to photography in natural colours, and he invented a camera and a lantern, which were named the Verak camera and lantern. I am not quite sure, but I think some results of Mr. Scott's work were shown privately; but his death has, I suppose, put an end to the matter, for we have heard nothing since. Mr. Scott claimed to have overcome all Mr. Ives's difficulties, and to have been able to render perfectly all colours, even the sheen and colour of metal.

Mr. Ives has constructed a special instrument, exceedingly ingenious, which he called the Heliochromoscope, but which he has rechristened the Photochromoscope. (For description see Appendix.)

I had a letter from M. Leon Vidal, who has paid considerable attention to this subject, and he informs me that M. Nachet, an optician well known to microscopists, is constructing an apparatus for viewing images in colours stereoscopically. This would be a great advance, but, of course, offers many difficulties. (See Appendix.)

For projection, Mr. Ives used, I believe, first of all a single lantern, with a large condenser and three smaller ones; now I think he prefers a triple lantern.

We now come to what is perhaps the most important application of this process, and that is the production of prints. There are, I know, many present here to-night who are taking practical interest in this subject, and to them I must apologise, and state that I cannot possibly include to-night all that is of importance to them; but I have already stated, and now repeat, that in the addenda to this paper will be abstracts of all that has been written or said on the subject.

In printing, there are practically two methods which are used, the collotype and half-tone, or process block. Collotype, as you know, is a process of printing in greasy inks from a film of gelatine, which is impressed with the image through the light acting on a mixture of a bichromate salt and gelatine. Now, in this collotype printing it is not the high lights of a negative, but the shadows which print, and a moment's thought will tell you that in our negatives the shadows are caused by those colours which do not act. Therefore, in printing from collotype plates, we have to ink our collotype plates with an ink corresponding in colour to those rays which do not act; that is, with the collotype plate made from the red negative we do not print in red, but in blue; with the plate made with the yellow negative we do not print in yellow, but in red; with the plate made with the blue negative we do not print in blue, but in yellow. This is a little confusing at first, but, when once grasped, is easily retained.

* Continued from page 426.

* It is, in fact, advisable to focus and measure to given scale, and focussing must be effected for each screen.

The yellow is printed first, then the red on top of that, and lastly the blue.

You all know the exquisite beauty of a good collotype when in monochrome. Many of you, doubtless, have not had the opportunity of examining a large edition of collotype prints from the same plate. If you had, you would find that the regularity and evenness of colour is an exception; further than that, any practical collotype printer will tell you that, as the plate varies in moisture as the temperature and humidity of the printing room varies, so does the amount of ink vary on the plate, and consequently we get unequal deposit of ink on the paper.

Now, in chromo-collotype or three-colour collotype printing we have to print three coloured inks one on top of the other, and the perfect result is to be obtained by perfect negatives and perfect balance of the colours. You can well understand that, if we get a series of prints which have, for instance, the blue ink relatively stronger than the yellow or red, the whole print will look as though we had given it a wash of blue all over; there will be blue in places where it should not be, and where it should be it is present in greater quantities than it ought to be; consequently it overpowers the red and blue, and the result is not correct. The same also applies to the red and yellow ink. For this reason, chromo-collotype is not, I am firmly convinced, a commercial process. It means that, if you are satisfied with anything, then you have merely the cost of three collotype printings; but if, on the other hand, you are critical, and you demand the results are to be put up to sample, and anywhere near the original, then it means that you will get about one or two from every twenty or thirty prints which will satisfy your requirements, so that the cost of the successful prints has to be multiplied by twenty or thirty, as the case may be. For these reasons—*i.e.*, the difficulty of obtaining true balance of inks, and the heavy cost of perfect prints if selection is resorted to—collotype cannot be used commercially, and we want some other process. I have just begun a series of experiments, which at present are too nebulous to do more than refer to, but I believe it possible to get over this difficulty.

We now come to process blocks for typographic printing. You all know that it is customary to produce a block by making what is called a grained negative, or a negative which is broken up all over into innumerable little black dots caused by the crossing of lines. This is all over the negative, over high lights, shadows, and half-tones; from this negative is made a block, that is, a sheet of zinc or copper is coated with a sensitive compound, exposed to light, and developed, and then etched in an acid bath; every little black dot protects the metal, and the lines are etched or bitten in. The result is, that when these blocks are mounted on a piece of wood, and placed in the printing press, you have a series of depressions, or hollows, and points, and the points take the ink. A homely simile is this: Take a piece of cloth or flat pincushion, and stick an innumerable number of pins in it, so that the heads just project above the cloth; imagine this your block; you pass a roller charged with printing ink over these pin-heads, and the ink is left on the pin-heads, and not in the spaces in between. Now, it is usual to make these blocks by using a crossed line screen; in the first process, blocks made for three-colour printing, each block was made by a crossed line screen. Now, wherever two of these dots of separate blocks fall one on top of the other in the print, you get two inks laid down; if three dots fall one on top of the other, you get three inks, and you get black; consequently the prints looked as though all the colours had been mixed with Indian ink—they were dull, heavy, and untrue. In 1892, Vogel and Kurtz suddenly conceived the idea of using blocks with one line only for each colour, so that it meant, instead of having six dots, you had three. This meant, of course, greater brilliancy of the colours, and greater truthfulness to the original. This process was patented in America, Germany, and, I believe, in England. Well, ladies and gentlemen, you have heard, I believe, the remark made before in photographic circles, "that there is no new thing under the sun;" that certainly applies in this case, because Ives made, in 1881, a reproduction of a chromo-lithograph by this very process, that is, of using one line block to each colour. I am not an authority on patent laws, but I question very much the validity of those patents.

E. J. Wall.

(*To be continued.*)

Our Editorial Table.

Phillips's New Exposure Meter.

J. Fallowfield, 146, Charing Cross-road.

This exposure meter is in the form of a neat boxwood plaque which can easily be carried in the waistcoat pocket. On the upper part are a series of divisions indicating the kinds of subjects, interior and exterior, that are likely to be photographed, together with a date table. The lower part of the meter shows at one and the same setting the relative exposures for twenty-one different-sized stops, the upper row of figures showing those marked on the Continental system, while the lower shows those marked on the British system. There are only two scales to set, and the following are the instructions:—

1. Set the upper slide so that the number representing the speed of the plate is opposite the name of the subject to be photographed.

2. Set the lower slide so that the arrow on it marked "shine," "cloud," or "dull" (as the state of the sky may happen to be at the time), is opposite the number on the upper slide representing the intensity of the light. The correct exposure will then be found against each of the twenty-one diaphragms marked on the scale.

This meter is in a compact and easily understandable form, and it should be of great assistance in helping the beginner to secure correctness of exposure.

Mr. Fallowfield has also sent us samples of some new frame mounts with impressed borders, which obviate the pasting or mounting of the photographs. The latter are slipped in from the side, and the mount imparts a finished and tasteful appearance to the pictures. The mounts are supplied in a variety of tints.

Specimens of Collotype.

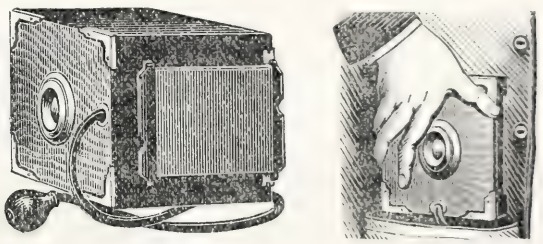
Morgan & Kidd, Richmond, S.W.

Last year's Convention group, and our Almanacs for 1893–4 testify in an admirable manner to the high degree of technical and artistic skill which Messrs. Morgan & Kidd bring to bear in working the very popular process of collotype, than which, at the present time scarcely any photo-mechanical process is in such great or deserved request. Messrs. Morgan & Kidd have, we believe, secured a large measure of patronage in the supply of collotype pictures for book illustration and other purposes, to which they are justly entitled, and, moreover, from some recent examples of their work that we have seen, we do not doubt that they will continue to hold a position second to none in this branch of photographic reproduction. The examples we have in mind show the collotype process to signal advantage. They consist of animal pictures, and it is fair to say that the characteristic touches and gradations of the originals appear to have been preserved as well as if they had been done by photogravure, to which process Messrs. Morgan & Kidd's examples bear a not distant resemblance, which is heightened by the plate marks imparted to the pictures. Of collotype we have not seen better examples than these, either native or foreign.

Horne's Pocket Camera.

G. F. Horne, 21, St. John's-square, Clerkenwell, E.C.

This camera is extended and made rigid by metallic supports placed inside at top and bottom. When folded up, it measures roughly $5\frac{1}{2} \times 5 \times 1$. The bellows is leather-covered cloth, and the mahogany



front, which is brass-bound, carries a single achromatic lens, with a shutter working behind the lens, and controlled by pneumatic means. A detachable focussing screen is given, as well as double dark slides, made of card and bound with fabric.

The camera, slides, &c., are so compact that they may be easily carried in the pocket. Considering the price, they must be pronounced extremely good.

The "Tyke" Dark-room Lamp.

J. H. Spencer, 19, Mentone-place, Leeds.

The body of this lamp is of japanned Russian iron, and it can be adapted for either gas or oil. On the front are two milled heads, one at the top and the other at the bottom. These actuate a roller blind, of non-actinic fabric, which allows of the lamp giving a ruby or a canary light at will, or the aperture may be left uncovered for contact printing or for lighting the room. Thus the light can be instantly changed from white to ruby, or from ruby to canary. No glass is used, ruby and canary fabrics being placed on the rollers,

and wound out or home as occasion requires. A Russian iron chimney is provided. The "Tyke" is a very handy and effective lamp, and should prove of great practical use in the dark room.

Mercier's Photographic Chemicals.

Messrs. Vogt, Herbst, & Co., of 6, Rood-lane, E.C., have been appointed sole agents for the United Kingdom for the chemical specialities of M. P. Mercier, of Paris. M. Mercier is a well-known chemist, who has devoted considerable attention to the preparation of developing and other compounds employed in photography, several samples of which Messrs. Vogt & Co. have kindly sent us for examination and trial. Among these are Mesol, for toning and fixing purposes, which consists of anhydrous sodium hyposulphite and talc, which, when dissolved, forms a neutral solution, and for which good tones are claimed; *Le Parfait* developer, a combination of hydroquinone and eosine, said to be a powerful and penetrating developer, the presence of the eosine obviating all fear of fog to the plate; and Iso-vireur nitrate of uranium paper, the latter giving very pleasing warm or sepia tones by simple printing and fixation. In the way of toning compounds, we have phosphate of gold (aurate sodic phosphate), a compound which, when dissolved, forms a good keeping toning solution, suitable for toning the various kinds of surfaced papers to a rich blue-black; as well as a platinum toning compound, yielding rich blacks. Graphol is a developing powder with an eikonogen base, which forms a clear and unalterable developing solution, suitable either for plates or paper; whilst Fluoreal, another developing combination, with which is allied anhydrous sulphite of soda, lithium, and fluorescein, has the power of *Le Parfait* developer, with added rapidity. We are much pleased with M. Mercier's preparations, which are evidently the product of great chemical skill, and a knowledge of the requirements of the photographer. They should be popular.

Photography Annual for 1894.

Edited by Henry Sturmey. London: Iliffe and Son, 3, St. Bride-street, Ludgate Circus.

Besides many useful reference tables, *Photography Annual for* 1894 contains a "Brief dictionary of chemicals used in photography," by Mr. W. A. Watts, M.A., which gives the uses, characteristics, solubilities, &c., of the various bodies treated of. Mr. C. H. Bothamley deals lengthily and exhaustively with the progress of photographic chemistry during 1893; Mr. Chapman Jones performs a like office for photographic optics, Mr. Bolas discourses of progress in photo-mechanical printing, and Mr. Albert Taylor is responsible for a detailed account of what was done in astronomical photography last year. These articles are admirable and valuable. A number of articles on various subjects are contributed by various other writers, and in addition to notices of novelties in apparatus, &c., and other information as to the trade, dark rooms, photographic societies, this handsome and well-got-up annual has about thirty capital illustrations in bromide, collotype, half-tone, &c.

Catalogues Received.

Bolton & Sons, 47, West Nile-street, Glasgow.—This consists of 135 pages, and has over 250 illustrations, giving particulars of many hand and stand cameras of different designs and prices, lenses, shutters, stands, lamps, dishes, dark-room requisites, and innumerable other accessories needed in the pursuit of photography. All the articles described appear to be of the latest types, and the catalogue a credit to the business enterprise of the house.

Charles Scholl, 35, South Castle-street, Liverpool.—Mr. Scholl, who is a stationer, printer, &c., has added a photographic department to his business. His catalogue, which extends to seventy pages, is devoted to an illustrated description of apparatus, appliances, and chemicals, the various items being well selected, and likely to supply the needs of amateurs and others.

C. S. Baynton, Exchange-buildings, New-street, Birmingham.—Mr. Baynton has signalised his accession to the business formerly carried on at the above address by Mr. Hulme by issuing a new and tastefully printed catalogue of photographic apparatus, chemicals, and materials, of some fifty-six pages, which synopsises in a handy form the various articles required by photographers. Mr. Baynton's knowledge of photography has stood him in good stead in compiling this handy catalogue.

News and Notes.

The hardest substance known is no longer the diamond. M. Henri Moissan, the isolater of flourine and the manufacturer of artificial diamonds, has discovered a carbide of boron which is as much harder than the diamond as the diamond is than glass. The new compound is stated to cut diamonds without difficulty.

The *Daily Chronicle* says that the amateur photographer and photograph collector of India is to have a magazine to himself. For thirty rupees a year the *Magazine of Indian Photographs*, described as a journal of pure Indian original photographs, with interesting and pleasant historical and descriptive accounts in English, French, and German, may be had in any part of the Postal Union. It will be issued monthly at Allahabad, each number containing twelve plates of the favourite 10×8 size, mechanically reproduced. The publisher is Mr. W. C. G. Renton, of Allahabad.

At the Westbourne Park Institute, 51, Porchester-road, W., the fourth annual Industrial Exhibition will be held on September 17, 18, 19, 20, 21, 1894. The following group will be open to amateurs resident in the parishes of Paddington, Kensington, Willesden and Chelsea, and the Western Division of the Borough of Marylebone:—Group VII.—Photography.—Section A, Portraits, single or groups; B, Land or Seascapes; C, Buildings (exteriors and interiors); D, Lantern Slides from Exhibitor's Negatives. Messrs. W. H. Brown and W. J. Black are the Honorary Secretaries of the Exhibition Sub-committee.

A new edition of the Catalogue of the library of the Photographic Society of Great Britain has just been issued. The Librarian (Mr. E. Clifton) says:—"The Society's library has grown to a very considerable extent; in fact, it is probably the most complete of its kind (purely photographic) in the United Kingdom. There still remains, however, a large number of books which it is without, and many of these books are at present in print, and can be easily obtained now, while in a year or two's time it may be very difficult to do so. One or two members have offered to contribute to a special fund to be devoted to the purchase of books," and the co-operation of others is sought.

English and French Picture-buyers.—England differs from other countries in its possession of a vast public buying pictures without either knowing or caring anything about art. In France, says Mr. Walter Armstrong in the *Art Journal* for July, the comparatively small number of people who collect pictures buy them for their own sake, as pictures, or as notes to be used in a scheme of decoration. The small *commerçant* or *rentier* does not buy them at all; in England he does. But what induces him to so expend his money? Not art, but the desire to have about him imitations of things or scenes with which he is familiar. It is the real pump on the stage in another form. Design, colour, chiaroscuro, all that has nothing to say to him. What he wants is a reminiscence of his summer holiday, or a field of beans in which he can weigh the crop, or a cow whose yield of milk he can guess. Many an English picture-maker would have become an artist but for the temptation put in his way by a public like this, and the middlemen who cater for it.

Central Photographic Club.—The "Social Outing" of the Central Photographic Club has been fixed for July 21, when Dorking will be visited under the direction of Messrs. J. H. Gear and E. E. Fortune, and arrangements are being made with the railway companies for a reduction in the fares. Continuous change is made in the exhibition of works by the foremost photographers of the day at the rooms of the Club, Ashley's Hotel, 13, Henrietta-street, Covent Garden. At the present time pictures by Messrs. A. J. Golding, A. Horsley Hinton, Lyd Sawyer, P. Martin, J. S. Teape, Eustace Calland, J. H. Avery and others are on view, and can be seen by non-members on presentation of their visiting cards. Taking time by the forelock seems to be carried out by the officers of the Club, for Bohemian Smoking Concerts are fixed for September 7 (under the direction of Mr. W. D. Welford) and October 12 (under the direction of Messrs. French and Slater. Lantern Evenings by Messrs. Richard Keene (Derby), Dr. Lansdell, Paul Lange (Liverpool), and others are being fixed.

The Southport Social Photographic Club's Fourth Annual Exhibition will be held from October 22 to 27 inclusive in Mr. Cross's Rooms, The Studio, 15, Cambridge-arcade. The following is the schedule of classes:—*For members of the Southport Social Photographic Club only.*—1. Landscape, set of four; 2. Clouds or Seascapes, set of four; 3. Architecture (exterior or interior), set of four; 4. Figure Studies (including portraiture and animals), set of four; 5. Enlargements, one only; 6. Instantaneous, set of four; 7. Flower Studies, set of four; 8. Copies of Pictures, other than photographs, set of four; 9. Outdoor Meetings, pictures taken at the Southport Social Photographic Club 1894 outdoor meetings, set of four; 10. Lantern Transparencies, set of twelve; 11. Decorative Transparencies, set of two. *Classes open to all photographers residing within a five mile radius of Southport Town Hall.*—1*a*. Landscape, set of four; 2*a*. Figure Studies (including portraiture and animals), set of four; 3*a*. Instantaneous, set of four; 4*a*. Lantern Transparencies, set of twelve. The Hon. Secretary is Mr. J. R. Cave, 52, Nevill-street, Southport.

At the opening meeting of the Congress of Archæological Societies in union with the Society of Antiquaries, held at Burlington House on Monday last, Mr. Ralph Nevill read the report of a Sub-committee on a Photographic Survey of England by Counties, based on what has already been accomplished by the Archæological Section of the Birmingham and Midland Institute, and followed up by the Society of Antiquaries of Ireland. The report recommended that each county should do its best to secure collections of large permanent photographs of matters of archæological interest, giving details rather than picturesque effects, with a scale to show the size, strongly mounted, and with full description on the back; that three copies of each photograph should be prepared—one for the county Society and one for the British Museum, and one for the Society of Antiquaries; and that these photographs should not be under-

taken hap-hazard, but that districts should be mapped out for amateurs, and that 100 or a portion of a county should be undertaken at a time. Mr. Nevill urged that Sir J. B. Stone, of Birmingham, should be supported in his endeavour to establish a Central Photographic Society for this purpose, to whom the local archæological societies should give all the aid in their power. This proposition was embodied in a resolution and carried.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,765.—"Improved Photographic Exposure Meter." D. PROVAND and W. S. PROVAND.—*Dated July*, 1894.

No. 12,769.—"Improvements in Shutters for Photographic Cameras." E. PICKARD.—*Dated July*, 1894.

No. 12,978.—"Improvements in the Manufacture of Albumenised Paper." R. MÜNCH.—*Dated July*, 1894.

No. 13,081.—"Improvements in and relating to Coin-freed Automatic Photographic Machines." P. MUSHET.—*Dated July*, 1894.

No. 13,088.—"Improvements in Frames suitable for Photographs and the like." W. MIDDLEMISS.—*Dated July*, 1894.

No. 13,193.—"A Method of Producing Photographs in Colours." H. A. FARDELL.—*Dated July*, 1894.

No. 13,196.—"Improvements in or relating to Photographing in Colours." J. JOLY.—*Dated July*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
16	North Middlesex	*Development.* H. Smith.
16	South London	*Making Mirrors for Photographic Purposes.* J. Miller.
16	Richmond	
17	Ashton-under-Lyne	Exc.: Flixton. Leader, John Andrew.
17	Birmingham Photo. Society	
17	Brixton and Clapham	
17	Hackney	*Orthochromatising.* W. H. Sodeau.
17	Hastings and St. Leonards	
17	North London	
17	Paisley	
17	Rochester	
17	West London	
18	Bury	
18	Leytonstone	
18	Manchester Amateur	Excursion: Alton and Croxton. Leader, J. Warburton.
18	Photographic Club	*Determination of Plate Speeds.* J. Cadett.
18	Southport	
18	Southsea	
19	Birmingham Photo. Society	
19	Glossop Dale	
19	Hull	
19	London and Provincial	
19	Oldham	
19	Oxford Photo. Society	
20	Cardiff	
20	Croydon Microscopical	
20	Holborn	
20	Leamington	
20	Maidstone	
20	North Kent	
21	Ashton-under-Lyne	Exc.: Miller's Dale. Leader, H. Rausch.
21	Croydon Microscopical	Excursion: Hayes and Keston.
21	Hull	
21	Leytonstone	Excursion: Bexley.
21	Liverpool Amateur	Excursion: Ingleton. Leader, J. T. Norman-Thomas.
21	Oldham	Excursion: Oldham Churches. Leader, J. S. Dronsfield.
21	South London	Excursion: Tower of London. Leader, Mr. Oakden.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 5,—Mr. T. E. Freshwater in the chair.

The CHAIRMAN introduced the new Hon. Secretary (Mr. P. Everitt) to the members, and, in acknowledging the compliment, Mr. P. EVERITT said he would endeavour to do his best for the Association.

Mr. J. Hodsoll was elected a member.

The Hon. Secretary distributed amongst the members copies of Messrs. Haddon and Grundy's paper on *Silver in Commercial Gelatino-bromide Dry Plates.*

A letter was read from Mr. A. Cowan, sending prints from the strips of sensitive plates developed by several of the members at a previous meeting, and which had received a graduated series of exposures. Mr. Cowan remarked that some of the strips had received ten times the printing time of others, and that some of the tints were so dense that no light could get through them.

It appeared from a discussion that arose out of an inspection of the prints that some only of the members had developed for gradation, while some had sought density, and others wished to demonstrate the rapidity and energy of their developers. In the result it was considered that the experiments had proved abortive as regards results through this misunderstanding.

Mr. R. A. Hodd exhibited a negative showing the lower spokes of the wheel of a vehicle in motion, while the top spokes were invisible. Upon this a long conversation took place.

PHOTOGRAPHIC CLUB.

JULY 4,—Mr. J. Nesbit in the chair.

The Hon. Secretary read a letter from Professor Stebbing, in which he said he had forwarded some photographic works for the Club library. These were placed upon the table, and numbered forty odd volumes.

Mr. FOXLEE proposed that they be accepted, and that a very hearty vote of thanks be passed to Professor Stebbing for his handsome present. This was seconded by Mr. Bedding, and unanimously agreed to.

Referring to some Chinese paintings belonging to Mr. TOTTEM, a member said that he had often remarked on the beauty of Chinese and Japanese coloured lantern slides, which he, unfortunately, had not seen equalled by English artists.

Mr. R. P. DRAGE remarked that the Japanese were undoubtedly clever in this work, and he thought the major portion of the work that left the country went to America.

The CHAIRMAN, remarking on the subject for the evening, viz., *Toning of Platinotype Prints*, said that he thought it was a mistake, also he had always understood that it was not possible to add another metal to the platinotype image.

Mr. BEDDING said that it was sometimes advantageous to alter the tone, as, for instance, in the gold process employed by Mr. Dollond, which brought out the details in shadows. Answering the Chairman's question as to whether uranium deposit would add to or detract from the permanency of the image, he said he thought it would detract, much in the same way as it did with uranium-toned bromide pictures.

Mr. MACKIE remarked that a simple method of obtaining a warm-toned platinotype print was to use a pad, in the printing frame, of blotting-paper which had been saturated with a solution of bichloride of mercury and then dried.

Mr. FRANK HAES said he was quite satisfied with the simple platinotype prints. They had a charm distinctly their own. Answering a question, whether it was advisable to use new or old paper, Mr. Haes said he preferred paper some months old, as it worked more kindly in his hands.

Mr. TOTTEM confirmed this opinion.

Mr. Tottem showed a print from a Hawk-eye film negative, taken on the quay at Boulogne.

The CHAIRMAN remarked that this print showed the good qualities of a rollable film negative.

Hackney Photographic Society.—July 3, Mr. R. Beckett in the chair.—Report of the preceding Saturday's excursion having been given by Mr. FORT, Mr. FARMER announced particulars of next excursion to Broxbourne on 7th inst. Members' work was shown by Messrs. A. Barker, Roofe, Norris, Hudson, Wilks, Farmer, Guest, Carpenter, and Westcott. In answer to a question from the box, "How to obtain coral tones on Alpha paper?" Mr. Beckett said that, if red tones were meant, they could be obtained by giving very full exposure. As a developer for Alpha he preferred hydroquinone and eikonogen, and said he thought that ferrous oxalate was not so manageable. Mr. GOSLING inquired, anent stereoscopic photography, whether there was any advantage in placing the lenses further apart than three inches. In reply, Mr. GOTZ said that in stereoscopic views a prominent foreground was required. If in the subject photographed the desired foreground was some distance away, then the space between the lenses might be increased with effect; if, on the other hand, the principal object was very near, the distance between the lenses might be reduced to less than three inches, but the latter was the best average distance. Mr. FARMER inquired whether members generally used the alum bath with P.O.P.? In the replies which followed the general opinion seemed to be in favour of using it in hot weather, especially when it was intended to squeegee the prints. It was pointed out that the prints should be thoroughly washed before and after the alum bath. Mr. J. R. Gotz then showed his Paragon hand camera. This is an automatic changer, and holds twenty plates in sheaths. The lens is a Suter's aplanat of four and three-quarters inches focus, has iris diaphragm, and gives pictures in focus at twelve feet distance with full aperture. The shutter works from one one-hundredth of a second to one second. Two finders are fitted, and the camera may be obtained in polished wood or covered with leather. The automatic charging arrangement is very simple. Mr. Gotz also showed a stereoscopic hand camera. This is fitted with a very fine shutter, and has all necessary movements.

Leytonstone Camera Club.—On Saturday last, under the leadership of Mr. D. G. Riddick, the members proceeded to Waltham, a pleasant afternoon being spent photographing the Abbey and old town. Many interesting negatives were secured, the famous Harold's Bridge and Abbey being the favourite spots, and those clubs that have not been to Waltham would find it well worthy of a visit. The outing next Saturday is to Higham's Park; leader, Mr. G. H. Cricks. The Club will proceed from Liverpool-street Station by the thirty-five minutes past two train, calling at Leytonstone at fifty-two minutes past two, and arriving at George-lane at three minutes past six.

South London Photographic Society.—At the last meeting of this Society, held at Hanover Hall, Hanover-park, Peckham, a paper on *Stereoscopic Photography* was read by Mr. THOMAS BEDDING. He said stereoscopic photography was in its revival stage, and by its means reproductions of views, groups, or scenes, are viewed with their respective heights, depths, and realism. He favoured the use of "twin lens" cameras for the production of stereographs, with the lenses placed (usually) three inches apart. Theoretically

the lenses should be capable of greater or less separation. It was a safe rule to select only such subjects in which there were several planes. About ninety out of every hundred photographers overlook that. It is necessary to have a good foreground—say, trees or bushes, ten or twelve feet from the camera. Snowiness in the prints, arising from hardness of the negative or improper printing, was to be guarded against. In mounting, both prints must have an identical base line, and each of them be two and a half inches wide. Three inches in height was enough, but a little more or less was not material, and a space of one-sixteenth or one-eighth of an inch wide allowed between the two prints, so that foreground subjects were not more than two and three-quarter inches apart. The lecturer recommended stereoscopic photography to the professional as a means to attract the patronage of the public. The past generation excelled in the production of stereographs of architectural subjects, for which it was particularly suited. At the close of his remarks Mr. Bedding exhibited a large number of stereographs of various subjects, many of them illustrating points in his paper.

Tooting Camera Club.—July 3, Mr. Beckett in the chair.—Mr. F. J CHILD. the late secretary, who has been appointed mineralogist and photographer to the "Jackson-Harmsworth" Polar Expedition, showed the camera he proposed to take with him, and gave a short sketch of the way in which he proposed to work. He intended to use ordinary plates, some dry collodion (Hill Norris), and films. Mr. NOCK made a few suggestions, and the VICE-PRESIDENT, in the name of the Society, bade Mr. Child "God-speed," hoped he would get a sharp picture of the Pole, and return covered with renown and rich in pictures. A new member (Mr. Riches) was elected.

Sheffield Photographic Society.—July 3, Ordinary Monthly Meeting, Mr. Bradley Nowill in the chair.—The Secretary announced that he had already got sufficient prints to make up for the presentation albums which would shortly be distributed amongst the hospitals in the city. Mr. D. C. BROOKS gave his lecture, subject, *Development for Beginners*, which was given in a lucid and interesting manner, and highly appreciated by the members present, and called forth an animated discussion.

Capetown Photographic Club.—June 13.—Samples of the Barnet ordinary and Rocket plates were distributed to the members, and a framed enlargement of a yacht taken on a Barnet plate was presented to the Club by Messrs. Elliott & Sons. Mr. Steer's demonstration of platinotype printing was unavoidably postponed until the next monthly meeting. Five gentlemen were balloted for and added to the roll of membership. The meeting closed with an exhibition of lantern slides by limelight, the work of several members of the Club.

Photographic Society of Japan.—May 20, Dr. E. Divers, F.R.S., in the chair.—The first business was the election of officers, and the following changes and additions were made :—Mr. Kajima Seibei resigned the Treasurership, and was elected a Vice-President. Dr. E. Baelz was elected a Vice-President. Mr. Y. Ishizu was elected a Treasurer. Mr. K. Ogura was elected a member of the Committee. The remaining officers for the past year were all re-elected. The Secretaries' report was not read, on account of the absence of Dr. Augustus Wood, but Messrs. Y. Ishikawa and W. K. Burton gave the general sense of it. The report is as follows :—Your Secretaries have to report a healthy growth of the Society. Regular monthly meetings have been held in the rooms of the Geographical Society of Japan in Tokyo, and in Yohohama, and in every case results of investigations have been exhibited and new theories in photography have been brought forward, which have largely contributed to the advancement of our science in Japan. Many members, both Japanese and foreign, have brought before the meetings results of new investigations in the photographic art, and have incited others to further investigations. It is worthy of remark that the Japanese members have especially distinguished themselves by new and striking investigations. In May, 1893, the Society held an Exhibition in Uyeno Park of pictures loaned from England, and prizes were awarded by a Jury of Japanese artists. For the success of this Exhibition the Society was much indebted to the efforts of three of its members—Messrs. Kajima, Hornel, and Henry. The Exhibition was continued for a period in the Public Hall at Yohohama. Since our last report there has been a large addition to the membership of the Society. It has been our deepest misfortune that one member has left us, one who often presided over our meetings, one whom we all loved, and whose loss we deeply regret—Mr. Edmund R. Holmes. We will not soon forget his sympathy for our efforts, his fine manliness, and his genial fellowship. On the whole, the year marks a decided advance in our Society, in a closer union of the different members, and a more exact investigation of photographic phenomena. Mr. W. K. Burton showed the results of work with the newest form of Dallmeyer's tele-photographic lens. The business meeting was followed by a dinner, partaken of by a large number of members and their friends, all of whom seemed thoroughly to enjoy themselves.

FORTHCOMING EXHIBITIONS.

1894.	
July 14–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road South Hackney.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

GLYCINE.

To the EDITOR.

SIR,—I do not gather from the pages of the JOURNAL that glycine as a developer has attracted the attention of photographers as much as it seems to me to deserve. I have been experimenting with it now for several months in comparison with all the recent and ancient developers, and I think it is the only real rival that pyrogallol has thus far met. Making the most rigid trials with exposures of the 500th and 1000th of a second, I find that the action of glycine is distinctly preferable to that of pyrogallol, to which it has the following relation :—It works slightly more slowly, but the greatest prolongation of the development does not stain the negative; it has less tendency to veil when the exposure is insufficient and the plates very sensitive, and the development may be pushed much longer without injury, but it has no greater power, though it may be used without bromide; when fully prepared for developing, it remains effective and colourless as long as I have tried it and over spaces of time in which pyro or hydroquinone discolour, unless prepared with acid, and it develops with sufficient power in a solution of a quarter per cent., giving printing negatives when pyro would have given, with the same exposure and treatment, too great density in the high lights to be harmonious. On the other hand, when the exposure is abundant or excessive, there is a difficulty in getting printing strength, as compared with pyro, the colour of the image being quite grey, so that for studio work or long exposures I prefer to use the old friend.

Glycine alone is very slightly soluble in water. I made a solution of $\frac{1}{2}$ per cent. in boiling water, of which a large part recrystallised out on cooling, but, when dissolved in a solution of potash, I have found it to dissolve in the strength of five per cent., and possibly it may go higher, which I have not tried. The strength of $\frac{1}{2}$ per cent. is enough for any ordinary use, but for too brief exposures more can be got out of the plate without fog by using it still weaker, and keeping up the development for a long time. I enclose a print from a negative taken with the focal plane shutter at $\frac{1}{500}$ of a second, and developed with glycine; I have some taken in half that time, but there is always a slight veil supervening before the image gets full strength and detail in the shadows. This is, no doubt, due simply to the limited range of the lens, those which I have used being the Zeiss and Goerz, Series III., which I find to be the most powerful available with satisfactory covering and penetrating power, *i.e.*, field and depth of focus.

The glycine developer is capable of repeated use, but I have not yet experimented sufficiently to determine how the old developer compares with a new one, and am keeping several lots of it to make experiments in future. What I can say with absolute confidence now is, that glycine has as great strength as pyro, and greater than metol, para-amidophenol, amidol, and hydroquinone, or any mixture of them, and seems to me the safest of all developers for exposures which touch on the insufficient, and with plates of extreme sensitiveness.—I am, yours, &c.,

Rome, July 7, 1894. W. J. STILLMAN.

COMBINED *VERSUS* SEPARATE TONING AND FIXING.

To the EDITOR.

SIR,—Now that the gelatino-chloride papers have so successfully asserted their position in public favour, I should like to suggest that something like a definite statement should be made upon authority as to the question of permanency under the different methods of treatment. On this subject there is wide disagreement. The Eastman Company, while claiming that Solio will bear any usual toning bath, have from the first consistently recommended combined toning and fixing; the earlier German papers took the same position; the latest arrivals also recommend a combined bath, while the Ilford Company deprecate such a bath, and stand faithfully by the separate processes. Very recently in the JOURNAL you have editorially put your foot down on combined baths as things to be accursed, and various writers have indulged in smart sayings about the ridiculous folly of people who load alum and lead and hypo into their baths along with the gold, and then (vain hope!) expect their prints to be permanent.

Leaving the smart writers out of the question, can we not deal with the matter scientifically, and wait to hear what the chemists have to say about it? I presume the Eastman Company's chemist could give reasons for the various ingredients of the Solio bath; that the Paget Company could also cite authority for their view; that the German chemists who have dealt with Aristotype and other papers have some weight; while the chemists on the other side, the Ilford, and your own scientific staff would have something to say in support of their opinion. But the matter needs to be dealt with in a scientific spirit and on a scientific basis, and then we shall all be benefited, and the papers will, or should, stand on a firmer

basis than ever. A and B may say it is, and C and D may say it is not, and we are no nearer the truth; but let each say why it is or is not, and what are the chemical reactions and results, and much will be gained.

So far as an item of personal experience is concerned, I have used the Solio combined bath since its first appearance for Solio and Ilford P.O.P. indiscriminately. The results can always be depended upon for appearance, and I cannot find any signs of fading among my earliest prints. The reason may be partially that I never work a bath to death, always allowing two grains of gold chloride to the sheet of paper, and washing thoroughly, though not for an excessive time, and the prints will, under this treatment, stand without risk any reasonable handling, even to the extent of washing in water at 70° to 75°.

But I may be all wrong, and, if I have only succeeded by luck rather than judgment, I should like to know upon sound authority, and so, I am sure, would many others.

So far as theory is concerned, it does seem to me that the dissolving out of the unaltered chloride before the gold is precipitated should give a more permanent result than when the gold is put on first and the fixing done afterwards; but probably I am altogether wrong again. Will somebody say, *and why?*—I am, yours, &c., W. Bishop.

July 4, 1894.

PHOTOGRAPHIC INVENTORS.

To the Editor.

Sir,—Readers are frequently writing to you for information on alleged inventions and novelty of patents, and the advice you usually give in these, as in other matters, is sound advice. In some respects photographers are an ingenious people, and are continually inventing (!) aids towards photographic perfection. But, instead of making an investigation into the novelty of their ideas, they, in nine cases out of ten, assuming that their ideas are perfectly new and original, take out a patent at once, and possibly spend a considerable amount of money and time in making models, advertising, &c., only to find out subsequently that their invention is by no means new, and that all their time and money have been thrown away. This is evident from the way in which certain ideas are patented year after year by different people—a fact to which, I believe, you have several times drawn attention, and which seems to apply to photographic patents especially. In the course of my business in Patent Agency I have frequent opportunities of noticing this duplication of patents for the same idea, and I cannot too strongly urge inventors to make a search, or have one made, if not before lodging their application for patent, at all events before completing their patent. This will probably save them money in the long run, or will certainly, in many cases, save them much disappointment and waste of time and labour. Whilst the majority of patent agents will agree in the main with many of your complaints as to the present condition of our patent laws, they at all events endeavour to assist inventors in their works and to save them from needlessly expending large sums of money in patenting and putting in the market useless or old inventions. Stanley G. S. Dicker.

24, *Tabley-road, London, N.*

A CALL TO ARMS.

To the Editor.

Sir,—We have taken on ourselves to reply to the remarks of "Rudder Grange," not because, as we think, he makes a direct charge against us individually, but for the reason that his letter brings up the question recently discussed in your valuable Journal with regard to the relative positions of the professional photographer, the dealer, and the amateur.

The sneer at amateur competitions is only a mask to cover the real grievance that rankles in the mind of "Rudder Grange." His true grievance is that he cannot get dealers' terms; and here we lay the finger on the sore point of many professional men. Before, however, we discuss this point, we will consider the amateur question as "Rudder Grange" starts with it.

It is probably true that the Amateur does not use one-tenth of the plates made, and we know two large firms who would corroborate this statement. How any of our professional friends can imagine that the amateur is a serious competitor, we cannot think. In portraiture the average amateur is nowhere, and only serves to show the superiority of the professional, Why? The answer is simple: Amateurs seldom can attain any proficiency in the retoucher's art, to say nothing of posing and lighting.

Those who are fond of turning over the pages of drawing-room albums do not, we think, find the amateur represented in any degree worthy of a thought. The fair sex, and we will even include the stern male, do not care to be libelled (save as a fleeting joke) by the average amateur, indeed we may say that the amateur attempt is generally followed by a visit of his victims to the studio of the professional. In *landscape* work, the amateur perhaps is more competitive, but professional landscape photographers are comparatively few, and these few generally in a large way of business. We consider that, on the whole, the amateur by his enthusiasm is a real help to the professional in creating a general interest in photography, and therefore to be encouraged.

To read "Rudder Grange's" letter seriously is to expose its inconsistency; he says, "Whom have the manufacturers to thank for the position they hold, with their large works, enormous staffs &c.? Certainly not the amateur." Surely, if the amateur is of such little account, why all this grumble about the poor amateur?

Now we come to the important point as regards the relations of the professional and the dealer. It is, of course, very annoying to the professional who uses a large quantity of plates to be put upon worse terms by the manufacturer than a little chemist who perhaps does not probably take altogether one-twentieth the quantity of photographic dry plates as compared to the photographer. The professional wants to know why he cannot get as good terms as the chemist; there are several reasons why, just at present, this cannot be. Professional photographers are not in the habit of going to manufacturers direct for *all* the various materials and apparatus they employ in their business; the rule is to go to some dealer, and the reason for this rule is manifest, a photographer requires small quantities of various articles, and these quantities are respectively too small to permit of the manufacturer of these goods paying carriage thereon. It therefore becomes cheaper and more covenient for the photographer to order his various articles from a dealer in one consignment by which he gets his goods *carriage paid*. Again, photographers are proverbially bad payers and fond of long credit, though they are also very fond of "cash at the time of sitting;" the dealer, on the contrary, is a far better payer, he pays for his goods by monthly accounts, and it is for this reason that the manufacturer rather seeks to do business with the dealer than the photographer direct. We speak from experience when we say that the extremely few photographers on our books (we have not six altogether) give us more trouble in collection of our accounts than nearly 1000 dealers. It speaks well for the dealers generally as men of substantial business habits when we say that in a very large output our bad debts amongst dealers do not amount to thirty pounds altogether. Were we to deal with the professional direct, we should have to keep a small army of debt-collectors and travellers, and, considering the long credit given to the professional, we should require a capital of such magnitude that we should prefer to retire on the interest rather than to make make dry plates.

It is all very well for "Rudder Grange" to talk about photographers having their own stores, similar to the Civil Service or the Army and Navy Stores, but he forgets that photographers joining such stores would have to pay *promptly* for all their goods. The real fact is this, the majority of small photographers are practically using the capital of the dealer to keep their concerns going. These gentlemen would like to buy their dry plates direct, and give their small orders for pyrogallic acid, hypo, &c., and all other unremunerative purchases to the dealer. In many trades the middle man of course has suffered very much, but in photographic businesses just at present the dealer must remain an important factor. To get over this, the photographer would have to exercise more thrift, be prompt in payments, take such quantities of goods as would bear free carriage from the manufacturers, and also supply amateurs with goods required. We do not, however, think there is much likelihood of this coming to pass for a very long day, and we do not see how "Rudder Grange," under the present circumstances, could expect manufacturers to throw over their best friends.

Rudder Grange's remarks on the late firm of Messrs. Samuel Fry & Co., Ltd., of Kingston-on-Thames, are, we think, extremely rude; the fact of their popularising photography by competitions had nothing to do with any failure on their part to continue business, the present most successful firms in the country have largely encouraged the love for photography by competitions and facilities to amateurs. The probability is, if any representative of Messrs. Samuel Fry & Co., Ltd., were to give any explanation at all of the matter, we think it would be that they trusted the professional too well, probably found too great difficulty in collecting their accounts in direct trading, and perhaps found too many bad debts on their books from the very men who are largely paid by their customers with "cash at the time of sitting."

It has been our intention for some time to offer a large *professional* competition prize; we hope to see "Rudder Grange's" name at the head of this competition later on. He speaks of a friend of his, a professional photographer, who is doing splendid business; we are glad to find that he acknowledges there is at least *one* professional who can do splendid business in spite of the amateur and his competitions, and we should say to "Rudder Grange," "Go thou and do likewise."—I am, yours, &c.,

Ashtead, July 4, 1894. Cadett & Neall.

To the Editor.

Sir,—Since the ever-recurring topic of the professional and his relations to the amateur and dealer is under discussion, will you allow me to express my opinion? That is, that there is far too much talking and too little doing. I notice that not one of your correspondents mentions the National Association of Professional Photographers (I give the title in full as they may be unaware of its existence, and the abbreviation, N.A.P.P., therefore be unintelligible). That society was formed, and is carried on, solely in the interests of the profession. The names of its

council and president are household words amongst photographers. It has had the hearty support of the technical press, and yet its membership is so small as to be a disgrace to the profession. If those gentlemen who are so indignant at the business methods of manufacturers would, instead of talking, act and combine, their grievances would soon be ameliorated.

Whether manufacturers would prefer to cater for professionals or amateurs if confined to one class, would be for them to decide; but, if we combine effectually, it will be in our power to say whether they shall supply both divisions, and if so on what terms. One of the latest projects of the N.A.P.P. is the formation of a supply store for professionals; now is the time to make the scheme a success or not. Finally, I do strongly urge all professionals to join a truly professional society, especially those who see the great need of doing something, but so far have only talked.

I am only a small country photographer, but, as long as there is any serious attempt among us at combination, it will be supported by this

July 7, 1894. MEMBER OF THE N.A.P.P.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Cassell's *Shakespeare* complete, in numbers; wanted, ALMANACKS and *Year-books* previous to 1885.—Address, CHIPPER, Highgate, N.

Exchange one dozen Bynoe half-plate printing frames, quite new, for one 12×10 block frame.—Address, L. WARD, 2, Lansdowne Villas, Staines-road, Hounslow.

Will exchange Mckellen's hand camera with rapid rectilinear lens, also tripod stand for same, for good half-plate set.—Address, E. ROBERTS, 114, Market-street, Atherton.

Will exchange a large portrait lens, or a whole-plate Eastman's roller slide (as new, for a good hand camera.—Address, MR. BARNES, 17, Holt-terrace, Longsight, Manchester.

Will exchange fifty lantern slides and box of slide colours for a good graduated or exterior background, or a hand-camera lens and some quarter sheaths.—Address, G. MOORE, Buckfastleigh.

Good half-plate camera, R.R. lens, three double slides, ash tripod, canvas bag, complete, for good quarter-plate set; approval. Difference, if any, adjusted.—Address, R. M. WORDEN, 4A, Cunliffe-street, Preston.

Will exchange Marion's combined embossing press for *carte-de-visite* and cabinet for whole-plate camera and lens, suitable for outdoor portraits. Difference in cash.—Address, W. BAYFIELD, c/o 7, Canute-street, Rotherhithe, S.E.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

S. M. M.; SCREEN.—See leading article on another page.

W. THOMPSON.—We have forwarded your communication.

CHAS. J. EASTON.—Communicate with Mr. Redmond Barrett, 129, The Grove, Hammersmith.

LEGAL says: "If I take views of houses on speculation, and print copies of same, is it illegal to offer them for sale at the houses without a licence?"—In reply: No.

O. SANSOME.—Preservers, trays, and all necessaries for ferrotype work can be obtained from Mr. Fallowfield, and probably from any of the large dealers in photographic material.

RONALD.—The "daylight" tissue is now on the market. If the dealer from whom you get your regular supply of material says it is not, and that he cannot supply it, order direct from the Autotype Company.

R. MCCONCHIE.—In all photographic operations it is best to use pure materials. The difference between the chemically pure and the commercial kind in price is very trifling with the salt referred to, only a few pence per pound, and a little goes a long way.

W. RAY.—As a portion of the studio and the camera, when it is near the sitter, when the sun is at its highest point, is shielded by the high building behind the background end, it will be very easy to avoid the difficulty. All that is necessary is to have a hood or curtain above the camera, so arranged that it acts as a shield to stop the sun's rays from the lens. In some studios, when the direct sun is not a source of trouble, such hoods are in every-day use.

S. N. A. P.—The lack of brilliancy and "peculiar markings" on the hand-camera negatives may probably be accounted for by one or other of the causes suggested in a sub-leader on another page. If not, send us one or two of the negatives—the worst and most pronounced examples.

A. FRAZER.—1. Opaline glasses, backs, and plush mounts are supplied by all such houses as Messrs. Marion's. 2. To secure the copyright of a photograph register it at Stationers' Hall. If the photograph is sent to us with one shilling and sevenpence in stamps, we will effect the registration for you.

C. R. says: "A year or two ago you mentioned that you had had a sample of bleached lac, which was made abroad, that dissolved in alcohol without leaving a residue. Can you tell me where I can obtain some?"—We cannot. Try some of the lac-bleachers, such as Waters & Son, Great Eastern-street, E.C.

A. C. W.—The State Apartments at Windsor have, we know, been photographed several times, but under what conditions we are unable to say, probably nothing more than obtaining the necessary permission. Write to the Lord Chamberlain's Department, Windsor Castle, and you will get particulars of where to apply for permission to do what you require.

J. E. OATEY says: "I have a print-washer, which I made myself and have had in use some five or six years, and not having seen or heard of any one else who has one of the same pattern, should therefore like to find out if there is a similar one patented. Can you give me any information as to the cheapest and most direct way to find out?"—You had better employ a patent agent to make the necessary search.

A. C. AND ASSISTANT.—It was very unwise to send the specimens to initials, care of——. Write at once to the "Superintendent of Police" of the district, sending a copy of the advertisement, and state your suspicions that your pictures were being used for specimens. Possibly others may have sent specimens in answer to the same advertisement, with the same result. Such cases are cruel frauds. If the funds of the Photographers' Benevolent Association were larger, it is a question they might take up. One or two convictions for obtaining pictures by fraud would act as a deterrent.

M. JACOBS.—Where is the novelty? One would have surmised that every one knew that albumen and a solution of gelatine could be mixed in any proportions provided that the temperature of the solution did not reach the coagulating point of the albumen. Of course there may be a modification in your mode of procedure that may be an advantage, photographically, over anything that has been done before, and that may be a subject for a valid patent, but a mere mixture of a solution of gelatine and albumen would not be.

INSTANTO.—It must not be assumed that shutters always work at the speed that the makers say after they have been in use for some time. They may work accurately enough, and probably they do, when they leave the manufactory, but there are many disturbing causes against their doing so afterwards. A few particles of dust in the working parts, oxidation of the metal, variations in temperature affecting springs, and the like, to say nothing of trivial accidents, will always be liable to affect the speed one way or other.

FERROTYPIST.—By "nitrite of iron developer" we presume you mean the protonitrate of iron, which was used by some in the old days of collodion positives as a developer. It was made by mixing a solution of protosulphate of iron with one of nitrate of baryta and then filtering out the insoluble sulphate of baryta formed by the double decomposition of the two salts. A favourite formula was to dissolve an ounce of nitrate of baryta in sixteen ounces of boiling water and then stir in one and a half ounce of protosulphate of iron, previously powdered, then add forty minims of nitric acid and alcohol twenty-eight, and filter.

T. N. P. writes as follows: "I have considerable difficulty in properly trimming prints and mounting them. I should be very much obliged if you would give me, in detail, the best method for trimming the prints and say which is the most successful way of mounting. I have tried starch and gelatine, separately and together, with more failure than success. It may possibly have been on account of the way it was made."—There is no better way of trimming prints than cutting them with the usual glass shapes. The mountants tried and found wanting are those in most general use. With regard to the method of making the mountants—Starch: mix into a stiff paste with cold water and then add boiling water till a thick paste is obtained, the same as starch is made for stiffening linen; Gelatine: soak in cold water till thoroughly softened, then heat. Mounting is such a simple operation that we cannot see how failure can arise. Perhaps our correspondent could arrange, for a small fee, with a local photographer for his mounter to give him a short lesson in the operation, if he cannot get on without assistance.

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LANDSCAPE SPOILING.

It is said that this is the Age of Advertising. Competition, which has been defined as the soul of trade, compels modern men of business to utilise opportunities and occasions for obtaining publicity among the great general public which were undreamed of less than a generation ago. One may fairly paraphrase the French saying, and remark that nothing is sacred to an advertiser, for, save perhaps within the precincts of ecclesiastical and official buildings, it is impossible to escape the advertisement in some shape or form. That commerce and the community are jointly the gainers by the enterprise and cheapness which are coeval with the extensive advertising of articles of general consumption may, we suppose, be fully admitted, and, that being so, objection to the omnipresence of variegated examples of the art of advertisement at once has the bottom knocked out of it. Æsthetes and the hypersensitive may deplore the lavishness with which almost all available spaces in towns are plastered over with more or less ugly or inartistic advertisements, but any appreciable diminution in their number or their area is not to be looked for. The fortunate circumstance, however, in connexion with the matter is, that, with the growth of a better and more refined taste, improvement in mural advertisements, from the artistic point of view, is certainly in progress.

One development of modern advertising which has evoked almost universal regret is that which has led to the defacement of many charming landscapes in various parts of the country. Travellers by most of the great trunk lines are familiar with innumerable huge boards, bearing inscriptions relating to pills, ointments, powders, &c., and placed in conspicuous parts of the country side. The same thing also prevails, we believe, to an equally great extent at places of natural interest and beauty away from railways in many parts of England and Scotland. So keen has been the resentment at this wholesale disfigurement of beautiful scenery that the matter has more than once been mentioned in Parliament, where, if we mistake not, a Bill was introduced with the object of abating the evil. It has also formed the subject of many communications in the public press, and even, on one memorable occasion, was referred to in a characteristic speech by Lord Rosebery.

The outcome of the agitation against the perpetuation of these unsightly boards, to the permanent spoiling of the lessening number of beautiful spots left for the public view, has been the formation of a Society for Checking the Abuses of Public Advertising, the second annual meeting of which has just been held. The Society has secured considerable support from many artists and influential public men, and at the meeting referred to a letter from Sir F. Leighton was read, in the course of which the President of the Academy made the following strong protest against the spoiling of landscapes by advertisement boards:—"Nobody," said Sir Frederic, "can resent more warmly than I do the vulgar bluntness of feeling which leads men to deface, or to lend themselves to the defacing of, the charms of rural scenery with staring advertisements. I include those who lend themselves to this barbarism; for the tradesman who pushes in this manner his pill, his plaster, or his nostrum, is not more blameworthy, but indeed less, than he who hires out his meadow or his coppice for such a purpose, and earns a pittance at the cost of so much offence. Never more than in our overridden days was the soothing, precious, restful atmosphere that breathes from natural scenery needed; never less than now can we afford to see its sweet silences invaded by these blatant blemishes of the strife of competing druggists and manufacturers, which, when we leave our towns, we would fain for a while forget. You will render good service if you abate this evil custom even a little."

The Society's annual report set forth that they had made the defence of scenery, the protection of the rural picturesque, and respect for the properties of the eye in towns distinctly a public question. They noted also, with satisfaction, that some of the firms who were compelled, in self-defence, to do what their competitors did, were eager for the legislation which would empower local authorities to prevent all alike from pushing trade in ways which the general feeling of the public pronounced to have no warrant in necessity, and to be a greivous offence to the eye.

It is, we suggest, impossible for any section of the community to withhold sympathy with the objects of the Society, and no class, we should think, would enter into the spirit of the Society's aim more heartily than the large and rapidly growing body of photographers, amateur and professional. To them, indeed, the conservation and perpetuation of all that is beautiful in natural views is of even more immediate importance than to artists of another kind, for the photographer finds it difficult, if not impossible, to eliminate objectionable features from his view at will. But not only to us as photographers are we

appealed to in this matter, but also as nature-lovers, which all photographers are, or should be, so that there is a double claim upon us to help rescue the face of nature from disfigurement.

Not many further words of ours are required to commend this matter of the protection of the fair lady, Dame Nature, to the active notice of our readers. Our special motive in drawing attention to it now is to enlist the support of the various photographic societies up and down the country (to the number of nearly 300) in the aims and objects of the National Society for Checking the Abuses of Public Advertising. By such support the hands of that Society would possibly be materially strengthened. Would it not be worth the while of the Committee of the societies affiliated to the Photographic Society of Great Britain to place itself in a line with the Society above referred to in this matter? We repeat, in conclusion, that photographers are as much interested in saving the country side from disfigurement as other people, and authoritative co-operation on their part and behalf would doubtless be welcome and effective.

ESTIMATING THE SILVER IN RESIDUES.

II.

In the previous article it was incidentally mentioned that there were other methods by which the precise amount of silver there may be in the residues could be estimated, by those unacquainted with chemistry, before they are despatched to the refiner. Here is one that will, perhaps, be preferred by some, to that of reducing a small quantity of the residue by heat. Although the method may read as being somewhat troublesome, it is really very simple indeed in practice. Something will then be said about the actual value of the metal when it is recovered, because it is clear that erroneous ideas on that point prevail with many.

Presuming that the wastes have been treated, and *intimately* mixed, as directed in the former article, weigh out a given quantity, say, if the operator is not familiar with delicate chemical work, an ounce, and put it into a small basin with four or five ounces of water and add a couple of ounces or so of sulphuric acid. Then drop in two or three small strips of zinc and allow the whole to rest for about twelve hours, or longer. By that time, what chloride is present will have been converted into metallic silver. What undissolved zinc then remains, if any, is removed, care being taken to detach any adherent matter that may be upon it. The contents of the basin are now transferred to a Florence flask that will hold twelve or fifteen ounces. It goes without saying that in this and in all subsequent operations care must be taken that none of the naterial is lost, or the result will be abortive.

After the residue has been allowed to subside, the supernatant liquor is decanted and the flask nearly filled with distilled water, well shaken, and, after settling, the water is poured off and the flask again filled, permitted to subside, and again decanted as before. The washing is repeated four or five times, and at the last decantation the residue is drained as closely as it can be without losing any of it. Next, three or four drachms of pure nitric acid are added by degrees, as the addition is usually accompanied by considerable effervescence. After the effervescence has ceased, the flask is placed over a spirit lamp and gently boiled for eight or ten minutes, then allowed to cool. A few ounces of distilled water are then added, well agitated, and afterwards allowed to settle. The clear portion is then poured off on to a filter, placed in a good sized bottle. To make sure that the whole of the silver is dissolved, a drachm or two more of nitric acid may be added to the flask, the boiling repeated, and a few ounces more of distilled water afterwards added. The contents of the flask are next emptied on to the filter and allowed to drain. The filter is then filled with water, and permitted to drain again, the washing in this way being continued until the water fails to redden blue litmus paper.

We have now the whole of the silver contained in the ounce of our residue in the bottle in the form of nitrate in solution. Hydrochloric acid is next added drop by drop, so long as turbidity is produced, to precipitate the silver as chloride. The contents of the bottle are now poured on a clean filter and left to drain, the filter being filled up two or three times with distilled water to wash the chloride. After the final draining, the filter and its contents are put on to a clean plate and dried somewhere free from dust; that may be done in the kitchen oven. When perfectly dry, the filter, with its containing chloride, is weighed, a piece of filter paper, the size of that used, being put into the opposite scale pan. From the weight of the chloride obtained the quantity of metallic silver is deduced. The equivalent weight of metallic silver is 108, and that of the chloride 143·5. Consequently, if, for example, our ounce of residue produced 143½ grains of chloride, it contained 108 grains of pure silver. In other words, each pound of the residue would yield 1728 grains of fine silver.

It must not be assumed that the metal recovered from photographic wastes is fine silver, because it is always more or less impure. Its degree of purity can only be determined by a proper assay. A piece of the metal is sent to an assay office, and in due course an assay note will be received showing the proportion of fine silver and of base metal in the troy pound. The cost of this, we believe, is sixpence only. If the gold residues have been added to the silver ones—a thing to be deprecated—a "parting assay" should be ordered. That will show the proportion of gold as well as that of silver and of base metal. The cost of this assay is about three times that of a simple silver assay. The value of the gold will be allowed for in the sale of the silver, unless, indeed, it be in infinitesimal proportion.

The current price of silver can always be learnt by consulting the money-article column of the daily papers. The price there quoted is for standard silver which consists of 92·5 parts of pure silver, and 7·5 parts of alloy. The price at the time of writing is but 28½*d.* per ounce. Formerly its price was more than double this. From these data the actual value of the metal recovered can be calculated, according to its purity, as shown by the assay note. It must, however, be kept in mind, that the price, as quoted, is by the troy ounce, and is that paid by the bullion dealer for the metal; but, as the refiner has to make a profit on the transaction, he cannot, of course, give so much as the market quotation for what he buys.

In this and the former articles the object has been to indicate to those who send their residues to refiners the best way to deal with them, and to, approximately, estimate their actual value before dispatch. If this were carried out in all cases, we are sure that we should hear less of the charges, from time to time, made against refiners, and if they were made there would be some data upon which to form an opinion. That has not been the case in a single instance with the recent complaints which have really suggested these articles.

ENLARGEMENTS ON A LIMITED SCALE.

HERE are, no doubt, very many studios in the smaller pro-ncial towns where the character of the business and other ıuses scarcely warrant the outlay necessary for cameras and nses for such special sizes of picture as the "promenade," grand panel," and the like, although it is possible oc-ıasional orders for such might be obtained if the means xisted for their production. Unlike ordinary enlargements, nis class of work is not readily put out, although, should the emand arise, we have little doubt but that many of the ex-ting enlarging firms would be ready to undertake the pro-uction of enlarged negatives, suitable for the purpose, at a easonable rate. In fact, some years ago, Messrs. Mawson & wan, if we remember rightly, made a speciality of carbon en-ırgements, from small negatives to panel and promenade size, nd the novelty took very well with the public and the pro-ession.

But, unlike the ordinary enlargement again, which in these ays requires to be artistically finished in black and white, or therwise, and therefore absolutely necessitates the services of skilled artist, the style of picture we speak of scarcely emands the exercise of any manipulations that are not within he daily routine of almost any studio, however small, for we nagine that most photographers possess the facilities for doing portion of the retouching and enlarging on their own premises. Ve know of many such establishments where it is only the etter class of work in these departments that is put out, the bulk f it being executed by either the principal or the assistants.

Pictures of the promenade or panel style do not differ except ı size from the ordinary *carte-de-visite* or cabinet and the perator who can produce the one is equally competent to finish he other, if only the needful apparatus be at hand. In this ase, assuming that the requisite appliances for producing the egatives direct are not immediately available, we have to fall ack upon a simple enlarging process, and, as the increase in ize required is not great, the task will be found far easier than he execution of enlargements upon a grander scale.

Let it be clearly understood that the plan we are about to escribe is not put forward as equal in convenience, or perhaps ven in quality of result, to the method of working direct, but imply as a means of overcoming a difficulty when the proper ppliances are not available. But, in its capacity as a make-hift, we can speak for its thorough efficiency. The process onsists in the production of a positive, preferably a trans-arency direct from the original negative, from which in turn a eproduced negative is made; and it is claimed for the method f executing these two reproductions here given that highly nished results can be produced with the expenditure of a inimum of artistic skill.

The first treatment necessary after the production of the riginal negative is to see to the removal of mechanical defects, nd to apply such retouching as may be desirable; but in this he course of procedure differs in no respect from the ordinary, xcept, perhaps, that the subsequent enlarging will necessitate little more care than direct printing. It may be pointed ut, however, that there is a vastly enhanced power of working pon and modifying the picture as compared with direct rinting, since not only is the original negative available for etouching, but also the intermediate positive, as well as the nlarged negative. It will be seen, therefore, that it is per-aps better to interfere as little as possible with the original egative or the positive, only touching out transparent spots in the former, and doing such work on the latter as is not permissible on the negative, and leaving the final retouching and modelling for the enlargement. In this manner there will be less risk of magnifying defects of manipulation, and, if a paper negative be selected for the final, the surface will present a far better basis for working upon than either gelatine or varnish.

The next question to be decided is the character of the positive or transparency. For many reasons we ourselves should prefer a carbon transparency; but where this process is not regularly worked a positive, printed by contact on an ordinary gelatine plate, will answer nearly as well. It should be well exposed and possess abundance of detail, without too much density; it should be soft and delicate rather than brilliant and clear like a lantern slide; in fact, absolute clearness of the lights will be an objection rather than otherwise.

An almost equally good result can, with careful and judicious management, be obtained from a paper positive, though undoubtedly it requires a little more skill. Still, in many instances, the paper positive may be found the more convenient plan. For this purpose a print is made in the ordinary way upon albumenised paper, either "ready-sensitised," or, far preferably, upon paper freshly sensitised in the manner to be described later on. On no account should gelatino-chloride paper be used, as it is quite unserviceable for this purpose on account of the feebleness of the image when viewed by transmitted light, as well as the unevenness of the coating of emulsion, and the coarseness of texture of the paper.

The albumen print is made considerably darker than it would be if required for ordinary purposes; deep enough, in fact, to show distinctly the finest details in the lights, but especially the flesh details when viewed by transmitted light, and yet not deep enough to obscure the details in the shadows. After printing, the picture may be toned, or fixed without toning, as may be preferred, but we think it is desirable to at least partially tone, as the finer details are then better preserved than in the case when the proof is fixed without toning. After well washing, the positive should be finished off in very hot water, to clear the pores of the paper as much as possible, thoroughly dried, and then impregnated with vaseline, white wax, or other suitable agent to render it as translucent as possible. It can then be used in the same manner as the transparency on glass. The retouching, if any, must be done before waxing.

We have warned the reader against the use of gelatino-chloride in the production of the positive, but the same objections do not hold against gelatino-bromide papers, at least those of the smooth kind, as not only from their very nature is the coating of emulsion more even, but the paper is of finer, better quality than that employed for the printing-out papers. The same remarks as to the character of the image will apply to developed positives as to albumen; they must be developed deeply enough to show vigour by transparency.

Photograph of a Landscape in Living and Dead Bacteria.—In the last number of *Nature* there is a reproduction of the very fuzzy-looking (or Salonesque) view, which, we believe, was shown by Professor Marshall Ward in the course of his paper on *The Action of Light on Bacteria* at the Photographic Society of Great Britain a few weeks ago, and which was made in the following manner:—A film of living bacteria in Agar was distributed over very thin (cover-slip) glass sterilised; this thin glass alone separated the film from the negative. After exposure over a mirror for two

hours, and then forty-eight hours' incubation, the bacteria behind the transparent parts of the negative were killed; those behind the opaque parts developed normally; those partly protected were retarded, giving the half-tones. The photograph was sharper when first made, several weeks before reproduction. The result is sufficiently remarkable, and quite equal to many we have seen from negatives inclined to be unsharp; which, of course, is easily accounted for by the interposition of the glass between the negative and this film.

The Progress of Astronomical Photography.—An address under this title was delivered by Mr. H. C. Russell, C.M.G., F.R.S., the Government Astronomer at Sydney, President of the Australasian Association for the Advancement of Science, at the last meeting. This address is now published, and contains the most complete and statistical account of astro-photographic progress yet published, its initial chapter taking us back to the Daguerreotypes of the moon by Professor J. W. Draper, taken in 1840, the address being brought down to the date of the middle of last year. Very complete references are given to no fewer than eighty-one sources of information. It is Mr. Russell's opinion that such progress will be made in this department of photography that ultimately all astronomical observations will be recorded by photographic means.

Splash Photographs.—At the Royal Institution, two months ago, Professor Worthington delivered an address on the splash of a drop, and illustrated it by a series of photographs of drops of various liquids falling on solids or into liquids. For complete details of the photographic apparatus employed, we refer our readers to a paper by Mr. R. S. Cole, which will be found on page 222 *et seq.* in *Nature* for July 5. Briefly, at the moment of contact of the falling drop an electric current was made to illuminate the phenomena, and the chief difficulty lay in synchronising and directing the light. Non-isochromatic plates were used, and the camera was fitted with an ordinary spectacle lens of quartz, the actinic focus of which had been previously ascertained, the object of using this lens being to avoid the loss of some of the ultra-violet rays which glass absorbs. Eikonogen was employed to develop, and was used in saturated solution, the whole operation being conducted in the dark to avoid fogging. In taking splashes of mercury, difficulty was experienced from halation around the bright reflections in some parts. To obtain the best contrast, many surfaces for receiving the splashing drop were tried, white xylonite being eventually selected. The writer states that "these photographs are, as far as we know, the first really detailed objective 'views,' as opposed to shadows, that have been taken with such a very short illumination."

Impurities in Snow.—Another example is given of the incorrectness of the idea that an excellent substitute for distilled water is to be found in melted snow. In a lecture on *The Chemistry of Cleaning*, delivered by Professor Vivian Lewes before the Royal Institution, he described the result of this process as applied to snow from the roof of an orchid house at Chelsea. The solid impurities were as follows:—

	Per cent.
Carbon	39·0
Hydrocarbons	12·3
Organic bases	1·2
Sulphuric acid	4·33
Hydrochloric acid	1·33
Ammonia	1·37
Metallic iron and magnetic oxide	2·63
Other mineral matter, chiefly silica and ferric oxide	31·24

But the futility of utilising melting snow in the endeavour to obtain pure water is not the only lesson to be learnt from this experiment. Every one knows that an object exposed to the air, with its surface in any position—vertical, slanting, or horizontal—and facing either the ceiling or the floor, will gather dust or become coated with a dirt deposit from atmospheric particles. When we see what these particles, such as are brought into the snow, are, the wonder is, not that photographs printed in silver should ever fade, but that the should be able to resist fading when a coat of sulphuric and hydrochloric acids, nicely arranged for close contact by an absorbing agen is continually being applied to and received upon them.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.*

DUBLIN MEETING.

On Tuesday evening, July 10, Sir Howard Grubb, F.R.S. (President in the chair,

Mr. Andrew Pringle gave an address on

THE USES OF PHOTOGRAPHY IN MEDICINE.

In order not to spoil a good cause by claiming too much, I will conten myself by asserting that no department of science has received mor benefit from photography than has the art of healing. And it must b evident to every one that, for such work as recording the state of a patien from hour to hour, the fluctuations of a disease from day to day, or it gradual progress after the time of operation until recovery or the reverse photography stands pre-eminent. As photographs of malignant disease are not pleasant things to look upon, I must content myself with bringing before you only a few very simple cases, but these will be quite sufficient to prove to you the extent to which, in medicine, the camera may act as a recording agent.

The lecturer then showed a number of lantern slides, pointing ou their salient features as each was projected upon the screen. The firs was the photograph of a boy afflicted with atrophy of the facial muscles The next was a most interesting case of lupus of the hand, both before and after treatment by Koch's *tuberculin*. The lecturer here took the opportunity of pointing out how important it was in medical photography that the work should be done with the utmost care. In the case which he had just shown them, he himself, by an error of judgment, made a photograph give an altogether false impression. By giving too short an exposure, he made a patient who had been operated upon look far worse than she did before the operation, although, as a matter of fact, she had benefited by the treatment considerably. Mr. Pringle then explained the apparatus which he had found convenient for taking pictures of hospital and other patients, the instrument consisting of a camera mounted upon which was a finder of the same focal length as the lens fixed upon the camera below it. He intended, however, to lay chief stress upon what is known as photo-micrography, and he would regard it more particularly in the light of an educational agent, and as used for teaching purposes. At schools of medicine and the like, where a large number of students are engaged in studies which are only made possible by the use of the microscope, it has been customary to cut a large number of sections from a piece of tissue, and to examine such sections, each under a different microscope, for the microscope is an instrument which permits of only one observer at a time. Now, no two sections can be identical and more often than not critical points, upon a right appreciation of which the subject-matter of a lecture may altogether depend, are absent in some; but, if the demonstrator be provided with an optical lantern, and he is able to exhibit the photograph of a chosen section of the tissue under consideration, he can point out its salient features to all the students at the same moment, and no one can complain that he is not as well off as his neighbour. Mr. Pringle then proceeded to give evidence of the advantages which he claimed for lantern demonstration by exhibiting a large number of photographs on the screen. First he showed some photographic preparations, which were exceptionally fine, among which were a slide of "voluntary muscle" by himself, an example of ossifying cartilage (Klein), a complete section of the human eye, showing very beautifully the cornea, crystalline lens, the retina, and the optic nerve, and a fine example by Bousfield of Cortis' organ of the inner ear.

Next came some very beautifully executed photo-micrographs of bacteria, including a "plate culture" of Proteus (Klein); two examples, showing bacteria in the dentile tubules of decaying teeth (Sewill), and a splendid example of anthrax bacilli in mesentery, by Pasteur.

The consideration of preparations of great rarity came next, and as an example of these were shown that happily rare organism known as *Filaria sanguinis hominis*, a parasitic, wormlike creature, which as its name implies, finds its habitat in human blood, but more particularly in

* Concluded from last number.

the blood of negroes. Three slides referring to this interesting organism came under review by the lecturer, showing—(1) its ordinary appearance; (2) the sheath of the parasite; and (3) the number of parasites in the restricted field of the microscope; and the comparative size of *F. nocturna* (so named because it is only found in the night time) and *F. perstans*.

Next came a few words about objects which exhibited unusual difficulties in preparation, and as an example of these the lecturer exhibited a photograph of *Cholera bacilli*, with their flagella plainly visible. These flagella are most difficult to see, even to a trained micro-copist, and it might easily have been asserted that a man had fancied he had seen them, and that they did not really exist; but here was the photographic record which cleared up the doubt conclusively. Another example of the *Bacillus termo*, also showing flagella, was thrown upon the screen, and the lecturer explained that in this case the hairlike flagella had been carefully measured by Dr. Dallinger, who had found that they had a width of only the $\frac{1}{200000}$ of an inch. It was quite a triumph to reproduce these microscopic objects photographically.

The lecturer next dealt with examples which, by speedy and convincing comparison, would serve to set at rest questions in which opinion was divided. He showed two preparations of nerve cells, the one being properly "fixed," and the other being faulty in that respect, giving rise to appearances which might lead a student into error. Examples were also shown of certain newly discovered bodies which were found in cancer, the real and the spurious being readily distinguished by the comparative method.

The next slides shown were of very great beauty. They were "culture plates," which had been exposed for five minutes, the one in the comparatively pure air of Wandsworth Common, and the other in Oxford-street. The first-named showed only a very few traces of bacteria, but the second was crowded with thick colonies of them. The advantage of at once obtaining photographic records of preparations subject to such quick growth and other changes as these culture plates are, was fully pointed out by the lecturer. In a demonstration of some particular points where only exceptional microscopic preparations are available, the lecturer showed as examples—(1) the position of the bacillus of leprosy in regard to cells and nuclei, and (2) the position of the organisms in certain vessels in a rare form of skin disease. In this last demonstration three slides were exhibited of the same section, each under a different amount of magnification. In the first, taken with a low-power objective, the organisms were hardly visible; in the second they were plainly seen; and in the third, where the magnification was 1000 diameters, they came forth in all their hideous detail. Some specimens of lantern slides, coloured by the Lumière method, elicited the fact that, although the original preparation was well imitated so far as the staining was concerned, the advantage gained was more than counterbalanced by loss of crispness, and the lecturer expressed a doubt whether, under such conditions, there was any gain at all.

In order to convey an idea to his audience of the actual magnitude of some of these microscopic objects, the lecturer threw upon the screen photographs of yeast cells, in conjunction with a network of squares, the sides of which measured only $\frac{1}{3750}$ of an inch. In the case of some other organisms, squares measuring $\frac{1}{7500}$ of an inch were employed.

In conclusion, the lecturer impressed upon his audience the desirability of photographers assisting, by every means in their power, a profession like that of medicine, which, above all others, can claim to have rendered the highest service to humanity.

In moving a vote of thanks to the lecturer, the President expressed regret that more medical men were not present to benefit by this most important paper.

The President here vacated the chair, which was then occupied by Mr. John Stuart, of Glasgow.

The next paper was

ON THE INFLUENCES OF TEMPERATURE UPON THE SENSITIVENESS OF THE PHOTOGRAPHIC DRY PLATE.

By J. Joly, M.A., D.Sc. F.R.S.

The subject-matter of this note was laid before the Royal Dublin Society some months ago. Most of what follows appears in the Scientific Proceedings of the Society (February 17, 1894).

The fact that a photographic plate loses in sensitiveness at low temperatures has already been the subject of experiment. But I am not aware of any experiments beyond those of Abney and Dewar, which were, so far as I can learn, confined to exhibiting the broad fact of the loss of sensibility. Many practical photographers have also, I believe, been aware of the fact from every-day observation.

Some couple of months ago, being then in ignorance of previous observations on the subject, I made experiments upon an Edwards isochromatic plate and upon a Wratten fast plate. The sensitive plate was backed, one half with a poultice of solid carbonic acid, just made into a paste with ether; the other half with a poultice of hot water in flannel. It was, in this state of unequal heating, exposed behind a double layer of thick plate glass to the light from a gas flame. Upon development the cold half showed but little light action; the hot was strongly affected. The double window of plate glass is essential to keep moisture from depositing and obscuring the cold half. A thin piece of glass is cooled so quickly that it obscures before there is time to expose it. The naked plate rapidly becomes frosted on the cold half.

In this experiment I observed that the effect was more marked upon the isochromatic than upon the plain silver bromide plate. It appeared of interest to find if this loss of sensitiveness could be traced to a loss of activity of the eosine sensitiser to rays of low refrangibility, thus accounting for the more marked effect upon the isochromatic plate.

To investigate this point, I modified a quarter-plate printing frame, so that a plate might be divided into a hot and cold area longitudinally by poultices, as before described. Upon this the spectrum was formed, from an electric arc, of such dimensions as nearly to extend the full width and length of the plate.

When an isochromatic plate (Edwards's) was exposed for a few seconds to the spectrum and developed up, it was found that the warm half of the plate showed the usual appearance; strong over the violet and blue, with a weak region in the blue-green (between F and E), and again a vigorous action in the green and yellow-green (between E and D), fading off gradually to the orange-red. This green-yellow sensitiveness is well known to be especially the result of the action of the dye.

On the cold half of the plate, over the violet and blue regions, there was an equal, or very nearly equal, density to that obtaining on the warm half; but all beyond, beginning at the weak region, E-F, and extending to the limit of sensibility, there was a most marked and striking loss of sensibility. Over the weak region there had been no action, or very little; the dense band marking the green-yellow was weakened and narrowed, showing, however, no shifting, and the yellow and orange, again, were almost without density.

Some ordinary gelatino-bromide plates (Wratten's and Cadett's) were next tried. In the case of these the hot and cold regions did not exhibit so marked a difference. The warm extended, indeed, further beyond F towards E, and there was a slightly inferior density all over the cold spectrum. I am not perfectly sure if this last is a real effect, for some stray light and fogging introduce uncertainty as to whether this may not be—in some degree at least—due to the inferior sensibility between E and F. For such rays in the stray light would be inactive over the cold, and active over the warm halves of the plate. The most marked effect is, however, in this case also towards the less refrangible rays.

It remains to consider how these results may be interpreted in connexion with theories of photo-chemical action and the action of the special sensitisers.

In the first place, we might consider that the deprivation of heat simply affected the fundamental silver bromide molecule, rendering it less resonant to the long wave-lengths, and hence affecting the photo-reduction on the plain gelatino-bromide plate in so far as this is ordinarily sensitive to long wave-lengths, and affecting the dyed plate the more seriously, as this is prepared to use the long wave-lengths, through the intervention or aid of the dye stuff. The experiments, in fact, revealed that, save for the survival of some activity along the special dense band on the green, the ortho plate was virtually reduced by cold to the limits of sensitiveness of the undyed plate.

While I am inclined to think that the silver bromide molecule is in some degree affected as above, I do not think the experiments on the gelatino-bromide plate prove that it alone is affected in the orthochromatic plate. On the view (favoured by Abney) that the sensitising action of the dye is a chemical one, started into operation by a photo-chemical change in the dye, it appears to me very probable that the experiments are, in fact, only one more example of the already long series of chemical actions known to be dependent upon temperature for their activity. Possibly, too, the initial photo-chemical action upon the dye is reduced in intensity at low temperatures. In short, the events set in operation by the light waves are complex, and all concerned with molecular stability, whether towards the periodic forces of light or their mutual attractions.

It is most probable that molecular stability towards either action is dependent on the quantity of energy possessed by the molecular system.

In the experiments described above, care must be taken that the plates have arrived at uniform temperature before development, or quite other effects would arise. With my own arrangements I am, of course, unable to estimate the temperature of the film. It is certainly not nearly so low as that reached by the mixed carbon dioxide and ether (—81°). With special arrangements, probably, even more marked results could be obtained. Photographs of yellow flowers upon cooled isochromatic plates contrasted with photographs taken on plates at air temperature show the effects of cold strikingly. A negative showing buttercups taken upon a plate at about—70° C. reveals only a very faint action. A similar isochromatic plate given exactly the same exposure at a temperature (15° C.) shows by contrast the marked loss of sensibility to the yellow colours at the low temperature. In very cold climates isochromatic plates will possess but little advantage over ordinary plates. The influence of length of exposure has still to be investigated. It might be that long exposure through a medium opaque to the blue and violet light would restore the isochromatic quality.

This was followed by a paper entitled

A NEGLECTED FIELD OF PHOTOGRAPHY.

By T. C. Hepworth, F.C.S.

Some time ago I was engaged in putting together the notes for a lecture on *Precious Stones*, and, in order to make the matter as attractive as possible, I determined to illustrate it by lantern slides. I soon found

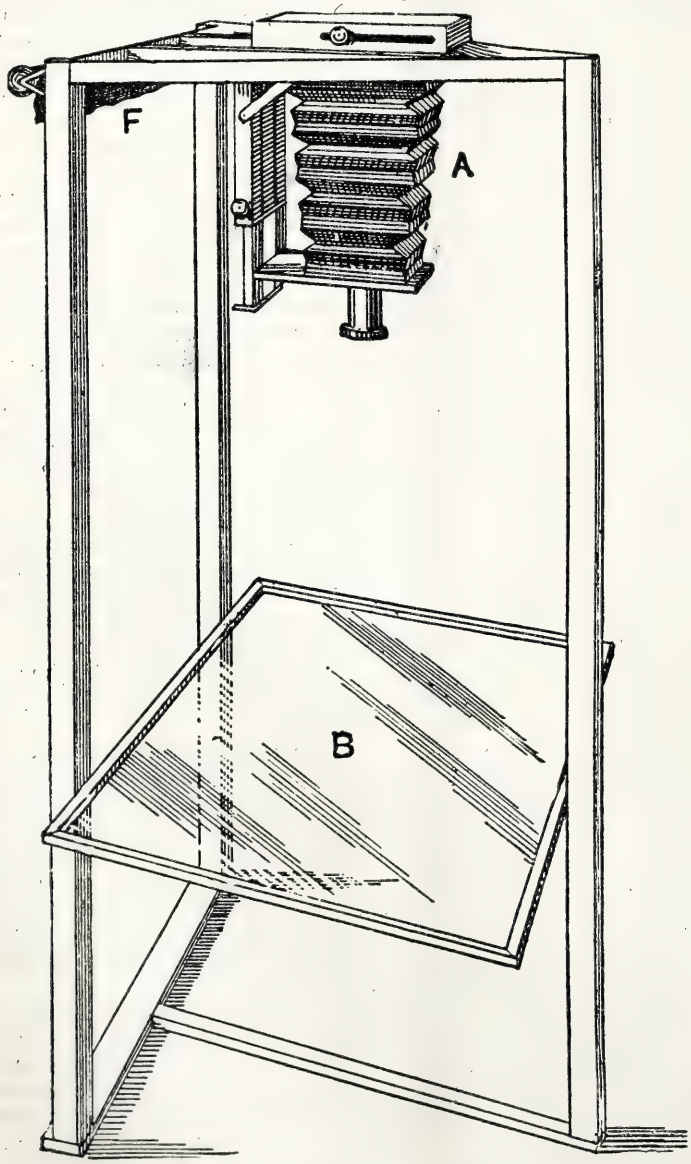


Fig. 1.
A, camera; B, glass platform; F, curtain.

that none relating to this subject was commercially obtainable, and the only thing to do was to make them myself. I was fortunate in obtaining permission to photograph in the Mineralogical Department of the British Museum, from the officials of which establishment I received every assistance and courtesy that I could desire; and my friend Mr Streeter, the eminent diamond merchant of Bond-street, in answer to my request, said, "Come here at any time, and take what you like"—a generous invitation which a burglar quite at the head of his profession might covet. The result was that I was soon hard at work on precious stones of all kinds, some of them of untold value, and I was able to secure a set of excellent negatives, but not with the apparatus which is ordinarily at the disposal of the photographer.

It became evident to me at the commencement of my labours that these stony specimens—sometimes taking the form of trays of loose gems, or crystals, so delicate that they would hardly bear handling—must be photographed from a vertical aspect; and the result of my cogitations was the construction of a special form of camera support which rendered this possible. Here is a drawing of it, to which I will beg your kind attention.

The camera is held in an enlarged form of tripod top, and points downwards towards a platform, which moves vertically in guides, so as to provide a means of obtaining images of various dimensions. The platform consists of a sheet of plain glass held in a frame, and we shall presently see the object of making it of that material. But, before we go further, I should like to show you a few of the specimens which I photographed with the apparatus in the form that you now see it. (The lecturer here showed upon the screen a number of photographs of diamonds and other precious stones, both in the matrix and in their cut and polished forms.)

I think that these illustrations will prove to you that this vertical method of working is, at any rate, the right system to adopt so far as museum specimens are concerned. But there are many other purposes to which it may be applied. Let me give you a few instances. You require to copy a picture from a valuable book in the possession of a friend. He may very reasonably object to part with the book, for books, like umbrellas and other wild-fowl, sometimes take to themselves wings; but if you take this stand to your friend's abode, and, in his presence, place the book beneath the camera for a few seconds, he cannot possibly object. Here is a photograph taken under the circumstances which I have just detailed. And this brings to mind a very great advantage in using this stand. In a town sitting-room there is usually only one place which is illuminated by the direct light from the sky, and that is a small area beneath the window. It is this space which is utilised by my vertical stand, and for the first time the photographer for copying work is rendered independent of a glass studio. Let me remind you that, under ordinary conditions, a horizontal surface receives many times more daylight than does one placed vertically, and we all know that, to get a first-class negative, we must employ the best light available. Beyond the mere copying of printed matter, I may point out that, for copying anatomical preparations of a perishable nature, this arrangement is invaluable, and I need hardly refer to the value that it must have in obtaining pictures of all kinds of small commercial articles for price lists and advertising purposes.

By employing the glass platform we can at once get rid of shadows, and this, in some cases, is of great advantage, while at the same time we can place at any distance below the glass a background of any colour, which, by screening the light, we can lighten or darken as may be required. I now show you a few photographs of cut flowers in which this course has been pursued, the shadows being annihilated, the transparent glass upon which the flowers rest being quite invisible, and an effect produced which could hardly be obtained by any other apparatus.

So far as I am aware, no worker has ever paid much attention to the photography of cut flowers. By this apparatus a handful of wild flowers and grasses may form the components of a very pretty picture, and no doubt it will occur to you that such studies would be of inestimable use to the designer of wall papers, the calico-printer, as well as the artists attached to other manufacturers.

The utilitarian may look upon this modified form of apparatus as being of very little use, for the utilitarian mind can see nothing good in anything unless it can be readily made to earn money, or represent money's worth in some form or other. Show such a person a beautiful piece of mechanism, a modern rifle, for instance. Point out its exquisite symmetry, the perfection of its movements, its perfect balance. Then tell him how far it will carry. He will want to know what it will fetch. But let me tell such a one that I have found out an economical use for my vertical camera which I am sure will commend itself to him. I was staying in lodgings at the seaside, and could not help observing what no doubt others have experienced, that, with regard to particular articles of food, a certain shrinkage took place. In the passage of a joint of meat, for instance, to and from the larder, a remarkable diminution occurred.

So one day after early dinner I photographed a certain leg of mutton before it made its exit from the dining-room. Here it is.

I dare say that you will, some of you, remember a picture by John Leech, which appeared a long time ago in *Punch*, in which the members of a family were represented busily engaged in sketching such a joint with a view to check a rapacious lodging-house keeper. The photographic method is far more correct, speedier, and a more scientific one; but, to make the thing complete, you must take a second photograph of the leg of mutton on the following day when it comes up cold, as you see here.

When the landlady sees the results of your photographic skill, she will either blame the cat or subside into tears, and tell you she has seen better days. You can sympathise with her, for your leg of mutton has seen better days too.

Quite a new system of portraiture is possible with this stand—a system which will be of great usefulness in dealing with the refractory baby. I wanted to show you the picture of a baby in its cradle, but no one would lend me one. I had to be content with one of larger growth, and here is the result, which I call *Laughing Eyes*. It is certain that a child taken in this fashion lying down is far more at his or her ease, and much more comfortable than if sitting or standing, screwed up in a head-rest. The body is at absolute repose, and repose of the features follows as a matter of course.

I have thus far dealt with the representation of opaque objects. You shall now see what the apparatus can do in another way, by a different arrangement of its parts, and to make the matter clear I must show you another diagram of the stand. The camera remains *in situ*, so does the glass platform upon which the object to be photographed is placed. But there are two additions, the one being a blind to shut off all light from

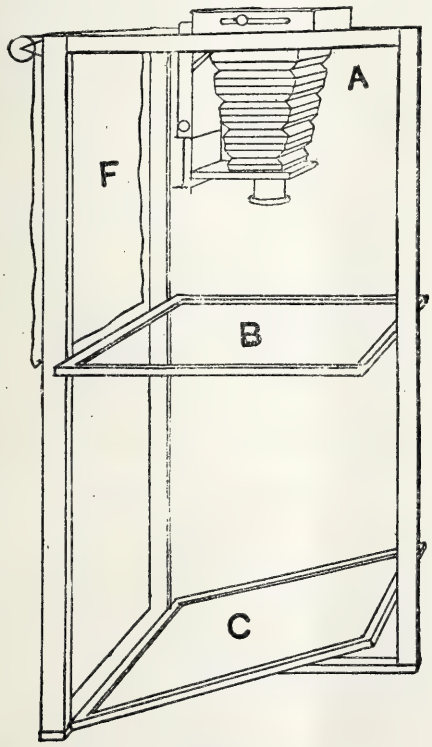


Fig. 2.

A, camera; F, curtain lowered; B, glass platform; C, mirror.

the upper surface of the platform, and the other a mirror to reflect the skylight upwards. By placing a negative upon the glass platform, a reduced or enlarged transparency in the form of a lantern slide, or any other form, can be obtained more easily than by any other plan that I am aware of. Such a negative may be of glass, or, if a limp rollable film, it can readily be secured by pennies at its corners. It lies flat and at rest, and it has no tendency to slip. I need hardly point out how easy it is, under such conditions, to put a sky in your picture from a separate negative; and in thus manipulating your negative or negatives you have the immense advantage of handling them, as it were, upon a table. Many persons shrink altogether from combining negatives for reduction in the camera, simply because the work involves so much dodging and trouble. Here all trouble is eliminated. With a few pieces of roughly cut paper you can shield landscape and cloud negative alternately, and secure a fine result.

One more application of this new form of apparatus let me show you. I am using it for the purpose of book or newspaper illustrations, when such illustrations are taken from photographs and have to be translated into line so as to meet the needs of the printing-press. Here is the arrangement. The glass platform is covered with a drawing-board,

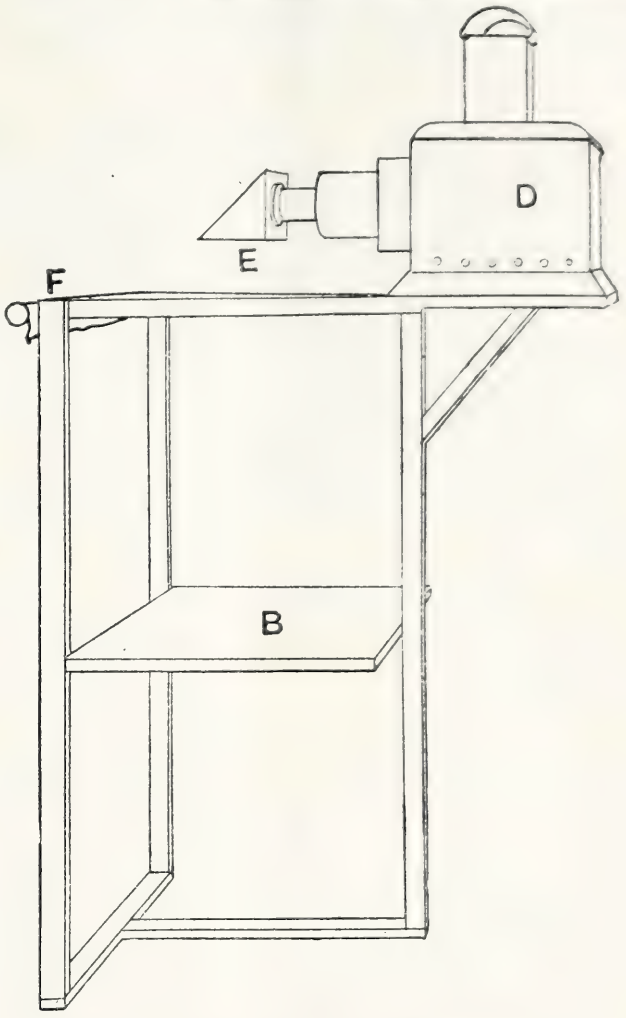


Fig. 3.

D, lantern; E, mirror or prism; F, curtain; B, platform.

and upon it the draughtsman places the cardboard upon which his sketch is to be made. The photograph to be copied is in the form of a transparency, and its image is thrown down by means of a sloping mirror attached to the lantern-lens hood. Here is a drawing very rapidly made in this manner.

It is always advisable to take with the proverbial grain of salt the statement of a parent with regard to the excellencies of his child; but I venture to anticipate that this infant of mine will prove to be very acceptable in various relations. Remember that it can be kept ready for instant use in the corner of an ordinary sitting-room. Make it, if you like, in cabinet form, or leave it a mere skeleton, such as I have shown you, and cover its nakedness with drapery, such as concealed the much-dreaded terrestrial globe of our childhood's days. Every medical school should possess an apparatus of the kind, so that pathological preparations of fleeting kind can be photographed before the inevitable change occurs. I have already shown you that a museum can by its aid make a pictorial record of the contents of its cases. Libraries can hardly afford to neglect such an aid to facsimile reproductions, and each law court and police office should certainly possess one. Indeed, the applications of this form of stand are manifold.

I have now told you, as the title of my paper promised, about a neglected field of photography, and you now see what I mean. The microscopist has in some cases adopted the vertical position for taking photo-micrographs, and possibly it has only been neglected by the ordinary photographer because the means of employing it were not ready to his hand. I claim originality for the use of a transparent platform and a mirror in conjunction with a camera held vertically. I may add that my friend, Mr. Dallmeyer, has on many points given me the benefit of his advice, and his name is joined to mine in the patent which is now

being taken out with regard to the apparatus which I have had the honour to describe to you this evening.

It has been said that the inventor of the sewing-machine taught mankind that we had for centuries been threading our needles at the wrong end. I cannot go so far as to say that we have all been wrong in keeping our cameras in the horizontal position, but I will say that there are innumerable cases where the vertical one is advantageous, and this thought has given me the excuse for calling your attention to what I consider a neglected field of photography.

Mr. J. Traill Taylor said he would caution those present against using the camera just described by Mr. Hepworth, which was not only not quite so new as anticipated, but had been patented by Mr. B. J. Edwards many years ago (in 1877), and whose specification had been illustrated by drawings similar to those now shown by Mr. Hepworth. Of course, if Mr. Edwards had allowed his patent to lapse, it was now safe for any one to use it, but not otherwise. The system of laying articles on the floor or on the shelf, and photographing them from above, had long been in use. He remembered a friend of his, an ardent conchologist, who illustrated a book he was then writing by arranging the shells on a small and low table, and then photographing them from above. Camera stands, too, had long been made with a special view to downward vertical work.

Mr. Hepworth had not been aware of its having been previously applied, but he would only claim the glass bed or stage as a novelty.

Mr. John Stuart, the Chairman, said that he had used a glass bed with a vertical camera for more than twenty years. The system was a useful one in many respects.

The thanks of the meeting were awarded to the authors of these communications.

Wednesday.

The Annual Meeting.

The members of the Photographic Convention held their Annual General Meeting at ten o'clock, Sir Howard Grubb, F.R.S. (President), in the chair.

There was a large number of delegates present.

Mr. F. P. Cembrano, jun., Hon. Secretary, said he had received invitations from Shrewsbury and Newcastle-on-Tyne, asking them to hold their next convention in 1895 at those places. He pointed out that this was the third time the Shropshire Camera Club had invited them to Shrewsbury, and he thought it would be bad policy and the worst taste on their part if they did not accept the invitation on this occasion.

Mr. C. H. Bothamley then moved that the Convention meet at Shrewsbury in 1895.

Mr. A. Cowan seconded the motion, which was carried unanimously.

Mr. A. Pringle said he had something more than pleasure in proposing the resolution he had been requested to lay before the meeting. At their previous meetings they had been always well received, and particularly well received, by the municipal authorities at the various places where they gathered; but they had never been accorded such a reception as that given by the Lord Mayor of Dublin and his lady. (Loud applause.) It was not merely a question of the ceremonies to which they had been invited, nor even a question of the large expense which had been incurred, but it was a question rather of the hearty goodwill with which they had been received; and he would therefore ask them to accord a most hearty vote of thanks to the Lord Mayor of Dublin and the Lady Mayoress for their great kindness and the favours which were to follow. (Hear, hear.) He was sure every member of the Convention would also always remember the liberality of the people of Dublin.

Mr. J. L. Lyell had the greatest pleasure in seconding the resolution, and considered that Dublin would be "hard to beat," to use an expressive term.

The vote was carried with acclamation.

Mr. Cembrano said they could not appreciate sufficiently the efforts of his colleague, Mr. Ruthven, and the local committee, for the immense amount of work they had done and the great help they had given him. It was his duty particularly to ask them to join him in a very hearty vote of thanks to those gentlemen and the leaders of the excursions for the immense trouble they had taken to make thei visitors comfortable. (Applause.) They all saw how they had bee received, and how well everything had been arranged and conducte the previous day. The local committee was a very strong one, an their arrangements were simply perfection.

Mr. G. W. Webster seconded the motion.

Mr. Lyell said they should supplement that vote of thanks b mentioning the Dublin Tramways Company. (Hear, hear.) He ha never known any trading company to act so generously before, an he thought they should put their indebtedness to them on record

The motion was then adopted.

Mr. Ruthven having acknowledged the vote of thanks,

Mr. Lyell reminded the Convention of one evening that would stand out prominently in their recollection of the Dublin visit, th conversazione in the Science and Art Museum, and he would propos a warm vote of thanks to the Lords of Committee of Council on Education for the loan of that splendid building, and to the Royal Dublin Society for lending the room in which their first meeting was held.

Mr. John Howson seconded the resolution, which passed unanimously.

Mr. Cembrano then submitted a short statement as to the condition of the Society. They were getting larger and larger in numbers every year, and this present year was their largest as to membership. They now numbered 270 at least. (Applause.) The question of finance was also satisfactory. When he first took up the duties of Secretary there was only a threepenny-bit to credit, and they now had £40 or £50 in hand, having discharged all liabilities.

The meeting adopted a cordial vote of thanks to Mr. Cembrano for the manner in which he discharged the onerous duties of Honorary Secretary during the past three years, on the motion of Mr. Traill Taylor, seconded by Mr. Webster.

Messrs. Houston and Webster having been re-elected auditors, and thanked for past services,

The following Council was then elected for the next year:—Messrs. F. A. Bridge, J. J. Briginshaw, C. H. Bothamley, R. P. Drage, J. P. Gibson, M. J. Harding, H. M. Hastings, A. L. Henderson, R. Keene, R. L. Kidd, Paul Lange, C. Phipps Lucas, Major J. D. Lysaght, George Mason, W. W. Naunton, J. Porritt, B. J. Sayce, A. Seaman, J. Traill Taylor, W. Taylor, J. A. C. Ruthven, J. L. Lyell, E. J. Humphery, John Fergus, Sir H. Grubb, Prof. J. A. Scott, W. F. Cooper, Sir C. A. Cameron, A. Werner, A. Cowan, A. Pringle, J. B. B. Wellington, S. B. Webber, H. Sturney, J. Stuart, J. Lawley, H. M. Smith, A. Tate, F. P. Cembrano, junior, H. Snowden Ward, E. J. Wall.

The Garden Party.

Subseqently the Lord Mayor and Lady Mayoress entertained the Photographic Convention of the United Kingdom at a garden party at Undercliffe, Killiney, his lordship's summer residence. By the greatest of good chances the weather kept up wonderfully well, for although three or four miles away rain was clinging tenaciously to the lofty headland of Bray, and rendering the regatta which was being held there anything but an unqualified success, that delightful stretch of villadom which nestles under Killiney Hill was almost unvisited by a rain cloud. The place itself is one of the prettiest of the pretty residences that are so numerous in the locality. There is a pleasant extent of grounds, completely hemmed in by hedges and rows of trees, and a splendid view is commanded from the house of Killiney Bay, stretching away to Bray in the distance. No more charming spot for a garden party could be conceived, and, with the Lord Mayor and Lady Mayoress as host and hostess, it goes without saying that the experiences of all who took part in the reunion were pleasurable in the extreme. The party proceeded to Killiney by special train, leaving Westland-row at 2.25 p.m. At Undercliffe they were received by the Lord Mayor and Lady Mayoress. The grounds looked extremely picturesque. An elegant marquee was erected in the centre, and in this cooling refreshments were dispensed to the guests. The band of the Rifle Brigade was also present, and contributed the charm of pleasant music to what was in many other respects a highly charming gathering.



KEY TO THE CONVENTION GROUP TAKEN AT DUBLIN, JULY 11TH, 1894.

1. Sir Howard Grubb (*Pres.*)
2. Lady Grubb.
3. Miss Grubb.
4. J. Traill Taylor (*Past Pres.*)
5. A. Pringle (*Past President*).
6. C. H. Bothamley (*Past Pres.*)
7. R. Keene.
8. F. P. Cembrano, Jr. (*Hon. Secretary*).
9. J. A. C. Ruthven (*Local Hon. Secretary*).
10. J. Stuart (*Glasgow*).
11. T. Fall.
12. G. Mansfield, J.P.
13. F. A. Bridge.
14. Mrs. R. L. Kidd.
16. Mrs. Lawley.
15. T. Taylor (*Birmingham*).
17. Mrs. Taylor ,,
18. Miss Birtles.
19. J J Gerard.
20. Miss E. Birtles.
21. Mrs. R. S. Baker.
22. J. Walker, T.C.
23.
24. J Lawley.
25. R. S. Baker.
26. J. Birtles.
27. J. L. Lyell.
28. W. Crooke.
29. Mrs. Werner.
30. Albert Taylor.
31. Miss Kay.
32. W. L. Allison.
33 — Kerr
34. F. Parkin.
35. W. Lawrence.
36 Miss Tate
37. H J. Redfern.
38. A. Seaman.
39. M. J. Harding
40. Dr. Liesegang.
41. Stewart Smith.
42. T. C. Hepworth.
43. H. Snowden Ward.
44. Mrs. C. Weed Ward.
45. G. W. Webster.
46. J. Potts.
47. A. E. Gordon.
48. Miss Potts.
49. Mrs. Scott.
50. Dr. Scott.
51. A. C. Baldwin.
52. L. Werner.
53.
54.
55.
56 Sydney Keith.
57. A. J. Potts.
58.
59. R. P. Drage.
60.
61. J. Richardson.
62. — Scorer.
63. T. Mayne.
64. D. Purvis.
65. — Gill.
66. Louis Meldon.
67.
68.
69. N. S. Kay.
70. Dr. Woolcombe.
71. Mrs. Abernethy.
72. A. Tate.
73. — Appleby.
74. H. Grubb, Jun.
75. Miss Grubb.
76. J. C Curtis
77. R. Cameron
78. A. L. Henderson.
79. D. Lewis.
80. Major Lysaght.
81. F. W. Hindley.
82. W. D. Welford.
83.
84.
85. A. Lawrence.
86. C. A. Brien.
87. G. F. Powell.
88. R. M. Inglis.
89.
90.
91.
92. J. H. Woodworth.
93. Mrs. Woodworth.
94. — Mundy.
95. J. F. Mellon.
96. W. Tomkinson.
97. Mrs. Hulme.
98. — Forshaw.
99. A. F. Mowll.
100. S. Hulme.
101. F. Eason.
102. J. L. Cox.
103.
104. W. Abernethy.
105. Mrs. Mowll.
106. W. F. Stapleton.
107. F. Moffat.
108. J. Lendon Berry.
109. W. Taylor, *Leicester*.
110. Mrs. Moffatt
111. W. Swanston.
112. A. Cowan.
113. E. Isaacs.
114. F. J. Wall.
115. Conrad Beck.
116. J. Heaseon
117. E. H. Ott.
118. H. Stearnes.
119. Mrs. Norval
120. Mr. Norval.
121.
122.
123. Daley.



Collotype—Morgan & Kidd, Richmond, S.W. *Negative by R. L. Kidd, Richmond, S.W.*

MEMBERS OF THE NINTH ANNUAL PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

A very numerous company of ladies and gentlemen were present. Various methods of enjoyment were open to the guests. There was lawn tennis on the lawn for the more actively inclined, and here and there through the grounds were seats, on which the more easy-going rested, and discoursed on the exquisite beauties of the scene before them. The spirit of photography, too, was rife, and many a snap-shot of hill and valley, wood and coast line, was obtained. Many, too, took groups of those present as interesting mementoes of the occasion. The garden party altogether was extremely successful, and the Lord Mayor and Lady Mayoress are to be congratulated firstly, on their excellently conceived idea; and, secondly, on the absolute success with which it was carried out. The following was the programme played by the band:—

Fest. March, "Tannhäuser," Wagner; Overture, "Schubert;" Suppé; Valse, "Blue Danube," Strauss; Selections, "Faust," Gounod; Song, "Dermot Asthore," Crouch; Intermezzo, "Cavalleria Rusticana," Mascagni; Selection, "Little Christopher Columbus," Caryll; Song, "Dawn," Somerset; Serenada, "La Palona," Yradier; "God Save the Queen."

The Dinner.

The members held their annual dinner at the Ancient Concert Rooms the same evening.

The President (Sir Howard Grubb) occupied the chair, and there was a large company present.

The Chairman proposed the toast of "The Queen," which was enthusiastically honoured.

The Chairman next proposed "Success to the Photographic Convention of the United Kingdom." He cordially welcomed the meeting to Dublin, and said that, the more he knew of the objects of the Convention and its working, the more he liked it. He looked forward with much pleasurable expectancy to their next yearly meeting at Shrewsbury. (Applause.) The establishment of the Convention marked an epoch in the history of photography. This body was still young, being yet scarcely ten years of age, but it was a healthy child, and he believed that its strength had been improved by the present change of air. (Laughter.) If in a few years' time they felt that they needed a tonic, he would suggest to them a repetition of this trip.

The toast having been heartily drunk,

The General Secretary (Mr. Cembrano) replied. He said the members of the Convention would always remember the kind reception which had been extended to them in Ireland, and, in common with the other members, he looked forward anxiously to another visit to Dublin.

The Local Secretary (Mr. Ruthven) also replied. He said it was a great pleasure and honour to the Photographic Society of Ireland to receive the Convention.

Professor Bothamley proposed "The Photographic Society of Ireland and the Local Committee," with which he coupled the names of Dr. J. A. Scott and Sir Charles Cameron.

The toast was well received.

Dr. Scott having responded,

Sir Charles Cameron also replied, and delivered a short humorous address.

Mr. Andrew Pringle proposed the toast of "The Chairman." He said that Sir Howard Grubb's name was so famous all over the world that it shed lustre, not merely on Ireland, but also on Great Britain. (Applause.)

The toast having been duly honoured,

The President shortly replied. He said that, while he was aware of the fact that the toast of the President would be proposed, he was quite unprepared for the warm manifestation of feeling that had been shown towards him. Any trouble that he and the Local Committee had gone to in connexion with this reception was repaid tenfold by the kind and friendly way in which they had entered into the spirit of any arrangements that were made.

During the evening several songs and recitations were given by the members of the Society and visitors.

Thursday.

At the meeting this evening, the President, Sir Howard Grubb, occupied the chair.

The first paper read was

ON COLOUR PHOTOGRAPHY.

By J. Joly, M.A., D.Sc., F.R.S.

It is doubtful if much more can be made of monochromatic photography than has already been accomplished. Indeed, we have had almost too much of it. If we take up a copy of a cheap monthly, I think we may well ask ourselves if we are any the happier for those half-tone illustrations which are given in ever-increasing abundance to the reader by a generous editor, who can more cheaply cover a page with this uncertain kind of art than with a page of letterpress. In nine-tenths of the photographic efforts we meet with we find no art whatever. For this reason, I believe, long years of black-and-white photography have been of doubtful benefit to the æsthetic culture of the public at large. It would be quite out of place to go into that question; my only object in alluding to it is that I think the advent of photography in nature's colours will have a great influence in changing all this. Any one who has looked at the exquisite image in his camera, full of light and colour, will understand me: it is nature. Photography in monochrome is most generally neither nature nor art. We cannot have too much of nature. We cannot bring it often enough before our fellow-beings. The mission of photography in the future will be to bring to the dwellers in our cities the glories of tropical vegetation, of seas and skies which their eyes can never directly behold. This is a great aim; it will most certainly be accomplished.

No method suggested in recent years of accomplishing photography in natural colours has at all been so fundamental in principle or so thorough in its aims, than those we thought first successfully applied to coloured photography by Lippmann. This method aims at reproducing the very wave-lengths with absolute accuracy of the original colours. It aims at this; but it is, at present, only with the greatest care that it can be made to accomplish it. Any one here who has worked at the method will, I think, bear me out in what I say. We can get iridescent gleams of purple, blue, and green on the spectrum without very much trouble; but the greatest uncertainty appears to attend our results. Exposing under coloured glasses again, I have found that the tints obtained resembled only approximately the originals. I was not so fortunate as to get exact similarity. Of course, all new methods are attended with difficulty, but there appear some differences in limitations to the applications and value of this method which, unfortunately, appear inherent to it. The first is, that the image is not transparent. In fact, this deficiency at once removes the method out of all competition with lantern-plate methods. It confines its application to wall pictures or album pictures. The second is, that the picture is iridescent in its nature—that is, it is a picture made of such gleams as we see in mother-of-pearl, beautiful in themselves, indeed, but not in keeping with the reproduction of the colours of objects possessing fixed colour. This last is a grave deficiency. The album prints or wall pictures must be so mounted or set as always to be regarded from the one point of view only. We must look at them in that same direction in which the light fell upon them when they were being taken. Lastly, the colours depend upon a distribution of metal in the image which, subjected to the least alteration, destroys the fidelity of colour; thus, moisture swelling the film, or any change within the film must be guarded against. One thickness only of the film is absolutely correct—that obtaining when the image was being formed, and here we touch upon what is probably one source of trouble in obtaining good results by this method. The film we expose in the camera is charged with the sensitive salt throughout its entire thickness. The light-waves streaming in from the image and back again from the reflector interfere with each other so as to produce stationary loops and nodes within the film. The positions of the loops are registered in invisible photogenic material. Now, when we develop, we build this photogenic material into metallic silver, and later we fix out all the intervening unacted-upon bromide. Can this be effected without changing the thickness of the original film? We must remember we are dealing with half waves by the distances. A fraction of a half wave-length distance will at once shift the colour. In fact, the entire range of the spectrum is only about one octave. The effect of this will be that the perpendicular direction would cease to be the direction of accurate colour reproduction, and we are left to choose the correct direction for ourselves.

And this brings me to recall a fact of history which the photographic world does not appear at all sufficiently alive to. I allude to the debt of gratitude we owe to the German physicist, Wiener, in this matter of colour photography by stationary waves. In the year 1889, before the Convention of German naturalists and physicians, Otto Wiener read a paper—now classical—on Stationary Light-waves and the Direction of Vibration of Polarised Light. This paper appeared in Wiedermann's

Annalen for May, 1890. In this paper he considers if it might not be possible to demonstrate stationary light-waves in a photographic film in a manner analogous to Kundt's method of demonstrating stationary sound waves by light mobile powders. He discusses the conditions under which this might be done. The film must be of extreme thinness and transparency. Such stationary waves, he points out, were suggested by Zentier in 1868 as affording an explanation of the colour in the chloride of silver photographs of the earlier workers. "The solution of this question," he adds, "would be of the greatest interest, and, above all, that of how far stationary waves may be utilised in the problem of procuring photographs in natural colours." But not only did Wiener thus suggest the application of stationary waves, and define the conditions under which they might be caused to act in a photographic film, but he, as many here know, in this same paper, actually accomplished the photographic registration of such stationary waves in a silver chloride collodion film. He employed reflection from a polished plate of silver deposited on glass, using this to back the collodion film. This, however, was only on his way to dealing with an important physical question, and the solution of this question led him away from carrying out his own suggestion of applying these stationary waves to colour photography. It is quite too soon for us all to begin to forget Wiener and his work. The exquisite suggestion was almost entirely his, and the pioneer's work was his, and, as we ourselves may some day hope to have our own priority for this and that respected, let us respect his.

We must even, if we wish to be quite just, go back further, and recall that Hertz's work was the foundation of the whole matter. Wiener freely acknowledges how Hertz's gigantic stationary light-waves stimulated him to resume an old research upon waves of visible light. He was only working at one end of a spectrum, Hertz at the other; a very long spectrum indeed it would be if all the intervening wave-lengths were filled in. Wiener finds his loops by the aid of unstable molecular groups; Hertz walked about among his loops, and detects them by a resonating circuit fifteen or twenty inches in diameter. To point any moral upon this origin of practical results in investigation is needless here; to the general public it is but continuing that perpetual crying in the wilderness.

I must now briefly turn to the other method of colour photography at present before the public—that is, composite colour photography. It will not be out of place to run over its essential features, for many are very excusably uncertain yet as to its rather involved principles. I fear to be historical, for the method has been led up to by so many workers.

There is good reason to believe that, in the case of normal vision, the nerves in our eyes are separately only capable of transmitting three distinct sorts of colour-sensation—a red, a green, and a blue-violet sensation. It is surmised that all other sensations of colour are due to the simultaneous excitation of two or three nerve systems to different proportionate degrees. Thus, when we look at the orange in the spectrum, we experience an orange-colour sensation solely because our red-sensitive nerves and our green-sensitive nerves are both stimulated to different degrees. Further up the spectrum, on the shorter wave-lengths, our blue-sensitive nerves aid in producing the various compound sensations which constitute the infinite gradation of tone extending up into the violet. Most people find it difficult to grasp that a red sensation is excited at a part of the spectrum which looks greenish blue, for example. But there is everything to bear out the theory that the only reason why we do not *feel* the red sensation *as* a red sensation is because the green and blue sensitive nerves are also active, and we cannot analyse the compound sensation transmitted to the brain.

Now I put on the screen a photograph of three curves drawn above the supposed length of a spectrum. The curves are those obtained by König. The curve with red written upon it represents the varying degree of red stimulation which our red-sensitive nerves experience by the different wave-lengths of the spectrum. Thus, suppose I could remove the blue and green nerve systems, or deaden their action, and leave the red nerves alone active, then the brightness of the spectrum to my red-sensitive eye would vary along its length proportionately to the height of the red curve. Thus, you see, it would look very bright somewhere near the D line, and would look much darker all through the blue; and, finally, in the violet it would die out into complete darkness, and we would be as unconscious of the existence of the extreme violet waves as we are at present, when, with our normal eyes, we look at the ultra-violet region or at the ultra-red. Without delaying further, it is sufficient to remember that the green curve simply represents the brightness of the spectrum to the red-blue blind person, and, finally, the violet curve the brightness to the red-green blind person. Consider, now, what happens to the normal vision, possessed of the three nerves, when regarding a point in the green-blue, for example. The red nerves are stimulated to a degree represented by the vertical light above the base line of the red curve, the green nerves by the ordinate to the green curve, the blue by the ordinate to the blue curve.

Suppose, now, we wished to photograph the spectrum. We obtain three distinct photographs of the spectrum, and thus get three negatives. But these negatives are not alike. In fact, we interpose before one of them such light-absorbing materials as will cause the image of the spectrum to be densest about the D line and to show gradually decreasing density into the violet on one side into the ruby-red in the other. We may speak of such a plate as *stimulated to opacity* by the various parts of the spectrum in the same manner as our red-sensitive nerves are stimulated to redness as they are exposed to the various wave-lengths. Where we see the red lightest the plate is densest, and so on. Our second plate is taken through absorbing materials which allow the plate to be stimulated to opacity in the same manner as our green-sensitive nerves are stimulated to greenness by the various wave-lengths, and so also the third plate records in depth of silver deposit the degree of stimulation which our blue sensitive nerves experience along the spectrum.

Now we take positives of three plates, and evidently we may speak of these positives as severally *stimulated to transparency* as our nerves are stimulated to redness, greenness, and blueness. How are we to use these positives? We put a piece of red glass behind the red-transparent plate, green glass behind the green-transparent plate, and blue glass behind the blue-transparent plate. We project all three upon the screen correctly adjusting the images in their proper positions and we have again the spectrum in all its variety of tones.

To again consider the former example, the tones are the green-blue. This, upon the screen, is built up of red, green, and blue light. The transparency of each lantern plate at the point is, moreover, exactly proportional to the several degrees of stimulation experienced by our red, green, and blue nerves at this point when viewing the spectrum. Hence, the synthesised image at the point carries the same sensation as the original did and we see the composite colour of the original.

Of course, as every wave-length in the colours of natural objects is represented in the spectrum, all the colour sensations excited in us by natural objects can be synthesised by the method of triple image photography. It is not in my opinion fair to say that this method is not really photography in natural colours for this implies more than is meant by those those who say it. The most that can be said on this score is that the method of taking the plate and viewing the picture is not the same as the ideal colour photography. But the colours are natural colours both theoretically, and, as has been shown, practically too.

Here, however, I must observe that some latitude appears to be allowable in taking the several negatives. In experiments of my own I have found this to be the case, and it is remarkable that Ives's earlier results were obtained according to an eroneous colour-curve. Indeed this was just the point upon which Mr. Ives had deemed Stolze to be in error. Nor is the variance an inconsiderable one. The question at issue was whether the fundamental red sensation is excited by the wave-lengths in the blue green and those beyond, and similarly whether the violet sensation is excited only by green-blue violet rays. Now, it appears very certain —as appears from the reasons given by Abney—that the red and violet sensations are not confined to opposite ends of the spectrum. If this were so, a green-blind person would see two spectra separated by a region of darkness, where both violet and red just failed to excite vision in him. As a fact he sees what to him is white light, due evidently to compound blue and red sensations. The curve of König's measurements, which we have upon the screen, also supports this view. Now, Ives worked upon Maxwell's curves which you see before you, and, in spite of the great discrepancy, obtained excellent results. From this, and from some experiments of my own, it does not appear to me as if very accurate reproduction of the curves was requisite in the practice of this method. This is fortunate, for to get the correct densities is a matter of much difficulty.

The great charm of this method is that it allows of optical projection. The colours are pigment colour. Again the registering positives can be freely copied.

And here I must break off. I have only ventured to say what I thought might be useful in enabling those present who have given *less* time than I have to colour photography to follow the remarks of members of the Convention far *more* experienced in those methods than I am.

It had been my hope that I would have been able to lay before you some results obtained by a procedure of my own, which I had been working at in the spring of last year. I had put this aside, thinking the difficulties greater than they actually proved to be, when I set about

preparing to bring the matter before the Convention. The inexpediency of bringing a publication before patents are completed has debarred me from seeking your criticism as I would have wished to have done. It must be my hope that at a future assembling of this Convention I may be allowed to submit my work to your judgment.

Mr. E. J. Wall said that he thought all would congratulate Dr. Joly upon the able summary of the subject which he had given, and, with regard to the statement that it was not actually essential to adhere to the use of screens which would give negatives with densities corresponding with the curves of Koenig's colour chart, he could fully confirm that, as he had found that various coloured screens could be used. The screens which he had used first of all were those recommended by Ives, but that, after a considerable number of experiments, he had found that a cobalt blue glass, and a chromium green could be used, and the third was a compound screen composed of a deep orange and a pale yellow cemented with Canada balsam. Although the projection of lantern slides was undoubtedly extremely interesting and amusing to many in this utilitarian age, the important thing was to produce printing surfaces, and he regretted that Dr. Joly had not entered upon the subject. The production of lantern slides was extremely easy, but it was far more difficult to obtain suitable negatives for printing, as practically it was necessary to work in the reverse way, as what was required was, for instance, in the negative for the yellow printing plate to produce a negative in which yellow had not acted at all.

Dr. Joly then exhibited and described

THE PHOTOGRAPHIC SEXTANT.

If it is not too much to expect that navigators should know how to develop a negative: in these days of reliable plates and ready-mixed developers, the snap-shot camera may be made of real value in the determination of solar altitude at sea. Not only might the accuracy of observation be greatly increased, but the risk of a false reading reduced to a minimum. What is perhaps of more importance, a moment too brief to afford a reliable eye observation might be completely availed of by the use of a photographic sextant. Lastly, and of not least importance, a permanent record of the observation remains for reference subsequently in case it be called in question.

The photographic sextant is not, in its optical principles, different from Newton's sextant (or, as it is called, the Hadley's sextant). That is, the fundamental principle is retained, viz., that the angle between the first and last directions of a ray which has undergone two reflections in the same plane is equal to twice the inclination of the reflecting surfaces to each other. There is, as in the ordinary sextant, a movable limb carrying a vernier, which travels over a divided half-quadrant. This limb carries also a mirror at its axis of rotation in the usual manner, reflecting the image of the sun on to a second fixed half-silvered mirror. This last mirror is situated at a little distance in front of a lens, which forms an image of the twice-reflected solar disc as well as an image of the distant horizon which the lens commands through the clear half of the fixed mirror. In fact, the camera takes the place of the telescope or the ordinary sextant.

To enable the observer to point the instrument, matters are so arranged that the image formed by the lens is, before exposure, reflected out by a movable mirror forming part of the shutter, and inclined at 45° to the axis of the camera. This image is again reflected by a second mirror, and the image of sun and horizon either directly brought to the eye of the observer by the intervention of an eyepiece, or cast upon a small screen in the manner of some viewfinders. The mode of using the sextant is as follows:—As the observer will know most generally his position, within certain small limits, he conveniently sets the vernier of the limb to read a whole number of degrees near the reading expected. He is now ready to take his snap-shot when any opportunity offers; if the sky be clouded, simply sighting the sun through the viewfinder, and noting the time immediately upon releasing the shutter. The position of the sun in reference to the horizon, measured upon the negative, will now give him, in conjunction with the reading to which the limb is set, and, when corrected for dip and refraction in the usual manner, the altitude of the sun observed. If he knows the local time, he has all the data required for calculating latitude. If he does not know the local time, a second snap-shot will be requisite; or he may make one at, or very close to, the hour of noon, the last two methods being most generally useful.

In computing the angular separation of the sun and horizon by measurements upon the negative, it is requisite, of course, to know the constant of the instrument he is using. This may be found by photographing, at a known distance, a linear measurement of known dimensions. I may remind the reader that astronomers, measuring upon photographic plates, can estimate the separation of stellar images to the one-sixtieth part of a second.

To prevent solarisation, dark glasses are used in the usual manner. These will not, of course, interfere with the light coming from the sky-line.

The negative may be preserved for future reference. It must be labelled with the fixed reading of the limb, and the time and date of observation. This is all that is required to render it an absolutely permanent record, or it would not be difficult to contrive that the setting of the limb be photographically recorded upon the plate when taking the snap-shot.

To render the construction of the instrument more clear to you, I have had the wooden model constructed which is upon the table. It was hardly accurate enough to serve to determine the latitude of Dublin, but a photograph of sun and horizon taken by it may be of interest.

Mr. Mansfield exhibited several direct carbon prints, produced on carbon paper prepared by M. Artigue, of Bordeaux. They were very beautiful, and elicited great admiration. The tissue is supplied ready-made, and the surface is delicate. It is sensitised by the application of bichromate solution to the back. After ten minutes it is dried, and exposed under a negative for half the time required for silver printing. It is developed by being placed in water, and pouring over it some very fine sawdust mixed with hot water. The coating becomes hard and durable after treatment with a solution of alum.

The usual votes of thanks followed.

Friday.

At the meeting on Friday, Mr. A. Taylor, F.R.A.S., gave an address on—

RECENT PROGRESS IN ASTRONOMICAL PHOTOGRAPHY.

Astronomical photography has been dealt with before the Convention on two previous occasions: by the late Father Perry, at Birmingham; and by myself, at Bath. To-night I desire to give an account of some of the new methods of work, and the results which have been obtained during the last three or four years—in fact, since the meeting of the Convention at Bath. It will be well, perhaps, that I should first call your attention to the remarkable way in which the introduction of photography to astronomy has not only opened out new and unexpected fields of research, but has necessitated an entire revolution in the instrumental equipment of the modern observatory. As our President recently pointed out in a discourse to the Royal Institution, it was necessary to entirely rebuild the telescope in order to fit it for photography. In visual observations irregularities in the movements of the telescope were comparatively unimportant, so easy was it for the observer to correct them as they occurred, and to suspend his measurements until the celestial objects he was measuring were accurately placed on the cross wires of his micrometer. In a photograph, however, the record is not that of any selected moment, but is an accumulation of impressions made throughout the whole of the exposure; and any irregularities of movement of the instrument would cause the star images to appear as lines, instead of round dots. A general strengthening of the instrument was, therefore, the first necessity, and the stand, moving parts, and tube are much stronger in modern than in the old instruments. A much greater accuracy of movement being required, special attention had to be paid to the bearings, and the driving arrangements were considerably improved. In an instrument like that made by Sir Howard Grubb for Dr. Gill, at the Cape, a photograph of which I now show you, special attention has been paid to all these points; and the new electrical control (from an invariable pendulum), invented by Sir Howard, so regulates the movement that it is impossible for the error of the pointing of the telescope to amount to more than one-fortieth of a second of time during the whole exposure given. As some exposures have extended to twelve hours, given in three separate periods of four hours each on successive days, and the resulting photographs have shown perfectly round star images, I think there can be little doubt that the required delicacy and accuracy have been completely attained.

Eighteen of the principal observatories of the world are co-operating to

produce an international photographic catalogue and a photographic chart of the stars, using object-glasses of thirteen inches' aperture, and 11 ft. 3 in. focus. No less than 22,000 plates are required for each series, the catalogue plates, with five minutes' exposure each, giving all stars to the eleventh magnitude, while the chart plates, with forty-five minutes, will include all stars to the fourteenth magnitude. The samples of these I show you are from negatives by Dr. Gill at the Cape.

In the study of the details of nebulæ much valuable work has recently been done, but none are so remarkable as those of Dr. Gill with the nebula near η Argus. Here, with three hours twelve minutes' exposure, you will see the remarkable character of this object; but the next slides, which show Herschel's drawing of the nebula, and a photograph taken with twelve hours' exposure at the Cape, are still more striking. This S-shaped structure in the drawing is entirely absent in the photograph, and there is considerable doubt as to whether this is a case of real change in the nebula or inaccuracy in the drawing. It will give some idea of the number of stars shown by this photograph to mention that the space of sky that would be covered by a shilling held at arm's length from the eye contains 200,000 stars, scarcely one of which would be visible to the unaided eye.

With star clusters equally good results have been obtained. In the cluster ω Centauri a field glass will not show any individual stars; Gould's catalogue of southern stars gives seven as reaching the tenth magnitude, while this photograph with two hours' exposure gives no less than 6389 stars.

Very much valuable work has been done with ordinary portrait lenses mounted on equatorial telescopes. The whole of the Milky Way, in the northern hemisphere, has been photographed by Professor Barnard, at the Lick Observatory, and by Dr. Max Wolf, at Heidelberg; while Mr. Russell, at Sydney, has used his portrait lens for the same work in the southern hemisphere. We have thus a complete photographic picture of the Milky Way, and the study of star distribution as shown on these photographs is yielding extremely valuable results. You will notice the bright cloud-like distribution of stars on these photographs by Professor Barnard, and the extraordinary dark lanes edged by bright stars that are characteristic of all these pictures, great similarity of which to the curves and other structures found in the solar corona are strong presumptive evidence of the existence of streams of dark matter ejected into a resisting medium in space. The connexion between nebulous matter and stars shown by Dr. Max Wolf's photograph of the α Cygni region have a very important bearing on the question of the method of formation of stars; and, without entering into any technical discussion of these phenomena, I may say that many theories previously held will have to be abandoned, as a consequence of the new light thrown by photography on star distribution. As incidents in this photographic work, I will also point out meteor trails, such as are shown on this photograph of Dr. Wolf, and the discovery of minor planets, which is now almost entirely effected by the use of portrait lenses. Mr. Russell has turned his lens to the study of the dark patches in the Milky Way, and he shows that the dark rifts, and even the well-known "Coal Sack," which was hitherto supposed to be quite devoid of stars, are really full of faint stellar forms So far as we have gone at present in astronomical photography, we have not yet sounded the depths of the stellar universe; every increase of exposure has given a corresponding increase in the number of stars, and many eminent authorities believe that, with sufficient exposure, we shall find that the whole of the heavens is full of stars, and it will be possible to get plates in which the star images will be so numerous and so close together that they will overlap, and the plate will appear simply a blaze of light.

Turning to the spectroscopic work, we find that photography has almost entirely replaced visual observations. Professor Pickering, at Harvard, developed Frauenhofer's original design of the spectroscope, and showed the possibilities of the object-glass prism in the study of stellar spectra. As an object-glass will photograph a large number of stars in one field, it follows of necessity that, if we place a prism in front of and completely covering that object-glass, we can simultaneously photograph, on the same plate, the spectra of all the stars in that field. Using this method, he has made a complete spectroscopic survey of all the stars visible from Harvard, and has extended the work by the establishment of observatories in Peru, so as to include all the southern stars. We thus have, for the first time, a complete spectroscopic catalogue of the stars; and the various stages of evolution from a cool to the hottest stage, and the regular cooling down to extinction, are readily recognised. This work has been further extended by Professor Lockyer at South Kensington, and I am able, by his kindness, to show you some of these photographs, in which you will see that the number of lines found in some stellar spectra will favourably compare with the number shown on our best solar spectrum obtained some years ago.

Dr. Vogel, of Potsdam, has adapted photography to the spectroscopic study of the motion of stars in the line of sight. Just as the steam whistle of an approaching train sounds shriller than that of a stationary one, while the whistle of a receding train is lower in pitch, so the wave-length of the light of an approaching star is shortened, and that of a receding star is lengthened. It follows, therefore, that a photograph of the spectrum of an approaching star will have its lines displaced towards the blue, and that of a receding star will be displaced towards the red; and we can measure the amount of the displacement by photographing on the same plate a line from the spectrum of a terrestrial element for comparison. These photographs of the spectrum of α Aurigæ taken by Dr. Vogel at six months' interval show this displacement, and it is possible to measure, not only the rate of movement of the star itself in the line of sight, but also, in this way, to measure the rate of movement of the earth in its orbit round the sun. Photography is peculiarly fitted to this work, since it is quite independent of atmospheric irregularities, and the results obtained are far more accordant and accurate than any visual observations could possibly be.

A new kind of binary star has also been discovered by this photographic spectroscopic work. Some stars, photographed by Professor Pickering, in America, and by Dr. Vogel, in Germany, showed a periodic doubling of the lines, and this was clearly due to the fact that in these cases we were dealing, not with single stars, but with two stars which were revolving round a common centre of gravity, the spectra of these being exactly superposed when they were moving at right angles to the line of sight, while, when moving in opposite directions, one spectrum was displaced towards the red and the other towards the blue. By measuring the amount of this displacement as shown on the photographs it is possible to determine the rate of revolution of each component; combining this with the period of revolution, it is possible to determine their distance from each other and the dimensions of their orbits, and also to calculate their combined and relative masses. The photographs of β Aurigæ, taken on successive days, show this doubling, and from a detailed examination of many plates it has been determined that the period of revolution is four days, the rate of movement 150 miles per second, their distance from each other 8,000,000 miles, and their combined mass 2·3 times that of the sun. No telescope that we can hope to construct will show this star as a double, and yet we have indubitable proof that it is one.

Time will not allow me to deal at all fully with the new star which was discovered in the constellation Aurigæ in February 1892, but some points connected with it so clearly demonstrate the value of photography to the astronomer that I must briefly mention them. It was discovered visually on February 1, 1892, but previous to this the camera had secured many records. Professor Pickering has invented an automatic apparatus for photographing the whole of the heavens visible at Harvard on every clear night. This automatic camera had picked up this new star on December 10, 1891, and a photograph of the same region taken by Dr. Max Wolf on December 8 does not show it; its time of appearance is therefore fixed by photography to within forty-eight hours, and many valuable records of its varying magnitude were secured between the time of its photographic first appearance and its visual discovery. Unfortunately, the great and rapid accumulation of plates at a modern photographic observatory does not allow their very rapid examination, and the appearance of the Nova remained unknown until the visual discovery by Mr. Anderson, of Edinburgh.

The most recent work in solar photographic spectroscopy is due to Professor Hale, of Chicago, with his new instrument, the spectro-heliograph. This instrument, as you will see, differs very slightly in appearance from an ordinary spectroscope, the essential difference being that, instead of allowing the whole spectrum to fall on the photographic plate, Professor Hale arranges for the spectrum to be stopped by a metallic plate with a fine slit in it, which only allows monochromatic light to reach the sensitive surface. He then moves his spectroscope slit across the image of the sun, and, keeping his photographic plate fixed, the selecting slit moves at the same rate in front of the plate. When the instrument is arranged so that only the bright-line K of the solar spectrum reaches his plate, he is able to photograph the solar prominences round the edge of the sun and the solar faculæ on the disc. A visual examination of the prominences would require at least two hours; the photographs can be obtained in as many minutes. Many faculæ, quite unobtainable by other means, are photographed by his instrument, and the results of the last two years' work have entirely revolutionised the study of solar physics.

The beautiful character of his spectro-heliograms is sufficiently evident from the slides, which his kindness enables me to show you.

At the total solar eclipse of 1893, April 15 and 16, the method of work was entirely photographic, and the results are far more important than any previously obtained. Time will not allow any discussion of these photographic results, but I thought you would be interested in seeing them, and I would particularly call your attention to the slide showing Bailey's beads, in which the solar corona is shown, and the edge of the sun breaking out at the end of totality. I have included the spectroscopic work in the slides brought down to-night.

As we announced last week, the meeting of the Convention for 1895 will take place at Shrewsbury, under the presidency of the well-known and much respected Mr. Richard Keene, of Derby.

Mr. R. P. Drage succeeds Mr. Cembrano in the Honorary Secretaryship of the Convention.

News and Notes.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—Technical Meeting, July 24, at 50, Great Russell-street, at eight p.m. Adjourned discussion on Mr. W. J. Wilson's paper on the *Development of Printing-out Papers*. (See *Photographic Journal*, vol. xviii. p. 278.)

"THE SOUTH AFRICAN EMPIRE."—This old-established journal, printed in London for South Africa, has appeared in a new form, with illustrated title-piece and white wrapper. The size has been reduced, and the general workmanship greatly improved. The contents are bright, readable, and well assorted to meet the needs and tastes of the large number of Colonial readers who desire to be posted, week by week, on the doings of the Old World, and more particularly on the movement of South African questions and produce in England. The new offices of the paper are at 14, Cockspur-street, W.

AT last, says the *Daily Telegraph*, we have got an authentic description of the woman of to-day, who, of course, is the mother of the lady of the future, and, as the description comes from a Judge, it may be taken as having nearly the authority of an Act of Parliament. She exists to be photographed. Even if she have no near relatives to whom she may send them, the necessity exists all the same; and this is the way, according to Judge Bacon, in which she makes friends who will accept a memento of her enchanting presence. "Pretty ladies," said his Honour, who evidently spoke with the authority which comes from experience, "make friends wherever they go. They meet other ladies in a railway train and get into conversation with them. Next morning they meet again, and, of course, kiss and slobber over each other. They are friends at once, and an exchange of photographs then takes place. The fact is that in this case the lady did not like the portraits, although they were beautiful and even flattering. But the husband must pay for them all the same." The gentleman in question is a Mr. Brown, whose wife went to Messrs. Cameron & Smith to be photographed before going out to India. She was taken in thirteen different positions and five different dresses, and was to have six copies of all that were good, the number actually sent her being sixty, for which the bill was 16*l*. Judge Bacon looked at the photographs and innocently asked whether they were taken for the frocks or the face? He was informed that the latter was a minor consideration, the chief things being the dresses and the trinkets. It was pleaded on the lady's behalf that she could not possibly have ordered so many photographs, because she had no friends in India to whom to send them. Then it was that Judge Bacon, in giving judgment for the plaintiffs, gave his idea of how ladies make friendships, for which some woman-of-the-future novelist will assuredly make him the "bold, bad man" of her next romance. Nevertheless, Mr. Brown has to pay.

CENTRAL PHOTOGRAPHIC CLUB.—In accordance with the resolution passed at the General Meeting, Mr. C. W. Gamble has been requested to act as Joint Honorary Secretary, which that gentleman has consented to do. Pictures by the following gentlemen are now on view at the rooms of the Club:—Messrs. J. H. Avery, Eustace Calland, Golding, A. Horsley Hinton, Lyd Sawyer, P. Martin, and J. S. Teape. Changes are made in the pictures every fortnight. Bohemian smoking concerts have been fixed for September 7, under the direction of Mr. W. D. Welford, and October 12, under the direction of Messrs. French and Slater. Lantern Evenings by Messrs. Richard Keene (Derby), Dr. Lansdell, Paul Lange (Liverpool), and others, are being fixed. The next social Outing has been fixed for Saturday, July 21, to Dorking. Special arrangements have been made with the South-Eastern Railway for the issue of special tickets, to enable members and their friends to travel at the reduced rate of 1*s*. 10*d*. return, instead of 3*s*. 3*d*. The train will leave London Bridge at 2.15 p.m. The railway company reserves a carriage both ways. Tea will be provided at the Temperance Hotel, West-street, at 6.30 p.m. Plain tea, 9*d*.; meat tea, 1*s*. 6*d*. Ladies are specially invited to attend the Club's Social Outings. Members can, if they so desire, take their cameras, but it is not imperative that they should do so. The return train leaves Dorking at 8.17 p.m. Members and friends will oblige by making early application for tickets to the attendant, at the Club-rooms, to enable all necessary arrangements for the comfort of the members and their friends to be completed beforehand. On the following Friday evening a demonstration of the development of the different brands of plates used at the outings, with different developers, will take place in the dark room of the Club. Hypo is provided for the members' use, free, in the dark room. The August outing will be to Weybridge, on the 18th, under the direction of Messrs. French and Slater. The Club is open from eleven a.m., with an attendant in charge, from whom information can be obtained. The Committee asks the co-operation of the members with a view of bringing the Club under the notice of their friends, so that our membership may be greatly enlarged.

BURCHETT'S COLOUR SCREENS.—From a circular relating to these screens which Messrs. J. H. Dallmeyer, Limited, of 25, Newman-street, W., have issued, we extract the following interesting particulars:—The screens now placed before the public, and by means of which these difficulties have been surmounted, are the outcome of a series of practical experiments by the inventor, Mr. Arthur Burchett. By the use of a *green* screen of a particular shade, in conjunction with a very light *amber* one, a truer monochromatic translation of the visual impression is obtained than by any methods hitherto employed. The effect of the amber screen alone is simply to cut off some of the blue, the secret of the better rendering of the colour values lying chiefly in the green glass, which by itself renders the greater part of the spectrum truly, with the exception only of the blue, which it fails to suppress sufficiently. The result, then, of using this particular green with a just sufficiently strong yellow one is to render the entire spectrum in its true value with a minimal increase of exposure, and that this is the case is proved by an actual photograph of a coloured spectrum taken with the aid of the screens. Turning to a more practical aspect of the question, we may state some of the advantages to be derived from the use of this invention. In landscape photography, apart from the general advantage of obtaining the truer colour values of the scene, the specimens of work done with the screens, and which are open for inspection at our showrooms, sufficiently prove the inventor's claim to render skies in their true relation to the landscape as seen by the eye, and that on the same negative without any doctoring, retouching, or tricks of printing. This is especially seen in the fine gradations of light cirrus clouds, the only thing needful being to avoid under-exposure. Curiously enough the screens almost entirely eliminate the evil effects of halation, several of the examples showing twigs and branches clearly defined on the face of the sun. Unlike ordinary yellow screens, the atmospheric effect of distance is not wholly destroyed, some very fine studies of sunset and mist effects having been obtained by the employment of the Burchett method. For copying paintings the screens give perfect results, such as will appeal to the most crucial artist's eye; and even for reproducing engravings they can be usefully employed, the lines being rendered clearer and the whites purer. As regards the most advantageous position for the screens in actual use, this has been found to be, where a doublet lens is employed, inside the lens tube on either side, and close to, the diaphragm slot, the green screen being placed in front and the yellow behind, and in this form we fit them wherever possible. In the case of a single lens, or in doublet lenses where the thickness of the glass does not admit of sufficient space for their insertion between the combinations (such as several series of the recently introduced anastigmats), the green and yellow glasses are cemented into one piece and placed behind the lens close to the glass, without, however, being in actual contact. All screens are fitted in removable settings so as to be readily detachable when their use is not required. The Burchett green and yellow screens can be used in conjunction with either isochromatic or ordinary plates. Isochromatic plates, however, give the finest results, and are recommended in preference, especially where paintings have to be copied. The increase of exposure necessary is: with isochromatic plates about six times, and with ordinary plates from nine to ten times. This increase of exposure prevents the use of the screens for portraiture, and in quick or instantaneous exposures in the field. For the benefit, however, of those who desire to improve on the results obtained in the usual way without very greatly increasing the exposure, Mr. Burchett has now introduced a lighter screen of transparent aniline colours, suitably combined and contained in the balsam cementing two plain pieces of glass. This balsam screen, although not perhaps giving the fine results obtained with the use of the green and yellow glass, has sufficient orthochromatic effect to improve vastly the rendering of skies and foliage in landscape work *while barely doubling the exposure*. Examples can be seen at 25, Newman-street, comparing the effect of a balsam screen, the green and yellow glass screen, and the lens alone. For portraiture in the studio, this method has been most successfully employed, a portrait lens having been used where the front combination was cemented by this coloured balsam. With regard to the manufacture of the screens, it is obvious that the same care must be taken in the selection of the glass and the optical working of its surface as with the glass of the lens itself, otherwise the definition will suffer seriously—in fact, the screens need to be carefully tested by competent hands to ensure good results. The presence of a few air-bubbles does not in any way affect their performance, but defects such as veins, striæ, &c., to be detected only by a practised eye, will appreciably affect perfect definition. Perfectly parallel surfaces are also absolutely essential. As a final word to users of the Burchett screens, it is recommended that negatives taken with their aid be developed with a solution of rather less strength than the maker's formula, and less restrained by bromide.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,269*a*.—"Improvements in Instruments for and Methods of Measuring the Actinic Intensity of Light for Photographic and other Purposes." A. B. CHATWOOD.—*Dated July*, 1894.

No. 13,434.—"Improvements in Portable Optical Lanterns." S. J. LEVI and A. JONES.—*Dated July*, 1894.

No. 13,437.—"Camera 'Magazine Backs' for the Storing and Exposing and Changing of Sensitised Sheet Films." J. McL. DOBSON.—*Dated July*, 1894.

No. 13,469.—"Dark-room Lamp." J. DAVIES.—*Dated July*, 1894.

No. 13,616.—"An Improved Brush or Duster for Photographic Negatives." J. B. BROOKS.—*Dated July*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
23	North Middlesex	*Diaphragms.* E. J. Wall.
24	Birmingham Photo. Society	
24	East London	*Toning and Fixing Prints.* Mr. Leblanc.
24	Great Britain (Technical)	Discussion on W. J. Wilson's Paper on *Development of Printing-out Papers.*
24	Hackney	*Toning.* W. Selfe.
24	Paisley	
24	West London	
25	Burnley	
25	Leytonstone	
25	Photographic Club	Toning Methods.
25	Southport	
26	Glossop Dale	
26	Halifax Photo. Club	
26	Hull	
26	Liverpool Amateur	
26	London and Provincial	
26	Oldham	
27	Cardiff	
27	Croydon Microscopical	
27	Holborn	
27	Maidstone	
27	Swansea	
28	Ashton-under-Lyne	Excursion: Hope, for Castleton. Leader, C. E. Redfern.
28	Hackney	Excursion: Rickmansworth. Leader, E. Puttock.
28	Hull	
28	Leytonstone	Excursion: Broxbourne and Rye House. Leader, C. A. Russell.
28	Manchester Amateur	Excursion: Brereton Hall. Leader, C. E. Bardsley.
28	Oldham	Excursion: Holmes Chapel for Brereton Hall. Leader, C. E. Bardsley.

PHOTOGRAPHIC CLUB.

JULY 11,—Mr. Crofton in the chair.

Referring to remarks made at the previous meeting *re* platinotype paper, Mr. HASTINGS said that, if one had paper known to be somewhat degraded—*i.e.*, having been left unprotected, say, for a month or two—it was quite possible to obtain a very fair print on it. This was the plan he adopted: First, "over-print," then put into a bath of five per cent. carbonate of potash, to which two or three drops of hypochlorite of soda solution had been added. The print in this solution would appear a greasy black image on an orange ground. On putting into the hydrochloric acid, it would "clear up." The paper he used for this plan was the "hot process," and the solution was cold.

The number of members present was rather small, owing, no doubt, to the Convention. The evening was agreeably passed by the personal (photographic) reminiscences of Mr. Nesbit and Mr. Troup, the latter concerning photography on the cattle ranches of British Columbia.

East London Photographic Society.—July 10.—A General Meeting was held, at which the Rules governing the Annual Exhibition to be held in October were finally passed, after which the Hon. Secretary (Mr. G. E. Marshall) exhibited a number of prints which had been developed with Zenotype, showing the various tones obtained thereby, and proceeded to show the *modus operandi* by developing before the members present, who were deeply interested in the production of so many varied hues. Mr. G. S. Pasco very kindly made a present to the Society's Library of books which he had kindly had bound for the Society.

Hackney Photographic Society.—July 10, Mr. T. H. Smith in the chair.—Mr. FARMER gave report of excursion to Broxbourne on the preceding Saturday, and the excursion for the next Saturday to Carshalton was arranged, Mr. Dean to be leader. The Hon. Secretary showed various photographic appliances, manufactured by Messrs. G. B. Kent & Sons, and also some lenses manufactured by Mr. F. Steele. These were handed to some of the members for trial. In reference to a resolution made at the preceding meeting that members should test the respective merits of the various developers as regards scale of gradation, &c., the HON. SECRETARY reported having received from Mr. Cowan some slips of exposed film upon which graduated exposures had been made. These slips, to the number of fourteen, were handed to twelve members to develop, each slip to be developed with a different developer; result to be communicated at next meeting. Mr. FORT then read a paper, entitled, *A Beginner to Beginners*, and gave results of his experiences as a beginner.

Leytonstone Camera Club.—July 14.—The members visited Highams Park, but, owing to the unpropitious weather, the attendance was small. The Park is situated between Walthamstow and Chingford, and some pretty landscapes can be secured of tree-covered walks, rustic bridges, &c., or, to those who prefer water scenery, the lake, with its swans and fishermen, offers many attractions. No permission to photograph is necessary. On Saturday next an Outing to Bexley has been arranged in conjunction with the Woolwich Photographic Society. The Leytonstone Club will proceed by the 2.2 train from Cannon-street, and join the Woolwich Society at Woolwich Arsenal Station at 2.38. The members will then proceed to Bexley by bus previously arranged for, and, given fine weather, a large attendance is anticipated.

Cardiff Photographic Society.—The enterprising, scientific, and sociable Cardiff Society of Photographers, says the lady correspondent of the *Western Mail*, resolved on a desperate undertaking one Saturday afternoon—no less a thing than "to go furrin" in a steam barge up the canal. In order to hand down their adventures "to the children yet to come," they invited your lady correspondent to accompany them. The first adventure I met with was the old puzzle, "Find the Barge." The "card" ran that we embarked from No. 1 Pier on the North-road. Faith in what I am told being an integral part of my nature, I set out northwards. I had never seen a pier on that road, but I was willing to believe there was one. I saw none, only a forlorn young man, who kindly told me the expedition would "embark from Lord Bute's stables." This was a poser, but he spoke so earnestly and soberly that I could not but believe that such a combination of stable and steam-yacht existed, when a small boy yelled out, "'Ere she is, acoming out of the tunnel!" There she was, empty, swept, and garnished with a lovely bed of sawdust for our feet, and benches whereon to rest. The yacht was provisioned for the voyage, with thoughtful kindness, by the President, with biscuits, cheese, strawberries, and a great many dozen bottles of "toast-and-water," "Irish and Scotch ginger-beer," "etcetery." One by one the brave and adventurous travellers arrived, each with his or her little black box of mystery and three "legs" strapped up neatly. A vast crowd assembled to wish us God-speed, and several very good snap-shots were taken of the yacht and her crew, just to show what they could do. At last the wrench of parting was over—the last farewell said, the last tear dropped, and "cheerily, my lads" heaved the anchor, and away we went "into that silent sea." Very enjoyable it was, too. The scenery on the canal is really very pretty. Llandaff looks charming from the water, and Melingriffith, and the woods beyond, gave some delightful snap-shots. The aborigines of the land we traversed came flocking to the banks to see us pass, and at every lock we were visited by people of all ranks, whose excitement was intense. You should have seen the genial President, hat in hand, thanking the people of the country for their welcome, and explaining the object of the exploration. After passing several locks, the man on the look-out cried, "Land ahead!" and soon we dashed through the breakers on to a pretty grassy bank, where we landed, and, standing as steadily as we could on our sea-legs, Mr. Allen grouped us, and Mr. Freke took a couple of photographs. After a two hours' charming voyage, we made the port of Tongwynlais, and landed. We were received courteously by the natives, and only regretted we had not brought some tablets of soap for distribution. Several bits were "taken," and a group of children, one of whom was a most lovely little "Rossini"-haired girl, made a delightful subject, and every man and woman put up their "legs" and disappeared under little black cloths to get a "snap." We were much amused by a young man who came out with a concertina, and cried, "Take me—even me!" Alas! too late. A scramble through the woods to the castle, and a good tea, which we enjoyed despite the justice done to the strawberries and the "toast-and-water," prepared us for our homeward voyage. The evening sun shone out brightly, and lit up the banks and the woods and the distant hills delightfully, and those who cheered us going up were waiting to speed us going down. Songs and speeches beguiled the voyage. When we gained No. 1 Pier we all flatly declined to leave the noble barge that had borne us so gallantly over the vasty deep, and so we had a most novel experience. Few of my fellow-townsmen—not even Mr. S. Allen, in his adventurous thirty years' residence—have gone where we went—into the very bowels of Cardiff. Hooting and whistling, we plunged beneath Queen-street. Thirty brave voyagers sang, and shouted, and yelled as we went beneath that busy thoroughfare. Out again into the open, and we were skirting the old walls of Cardiff! With a keen interest we marked their weather-beaten stones, and then we safely landed at the "haven where we would be," and so ended the voyage perilous of the brave photographers of Cardiff.

FORTHCOMING EXHIBITIONS.

1894.	
July 20–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road South Hackney.

Correspondence.

COMBINED *VERSUS* SEPARATE TONING AND FIXING BATHS.

To the EDITOR.

SIR,—Mr. W. Bishop, in his letter, overlooks the most important point. I suppose no one thinks for one moment that the addition of either lead or alum increases the chances of the permanence of a photographic print, but manufacturers have to put on the market articles not only for the careful scientific worker, but something that a schoolboy, knowing nothing whatever of photographic chemistry, can obtain satisfactory results with; and, compared with albumen prints, there is no doubt that the gelatino-chloride papers in the market are a great advance, especially in their ability of withstanding the destructive action of sulphur on the image.

The manufacturer has to turn out paper by the mile almost, which has to meet the requirements of all sorts and conditions of men, and it is here where the scientist and chemist finds the difficulty. I am sure that the chemists and the manufacturer must be driven nearly mad sometimes by the difficulties they are asked to overcome, and one can only wonder that they are able to succeed as they do.

Probably during the last eighteen months I have tested nearly a thousand prints to find out their comparative ability of withstanding the destructive action of sulphur, &c.; further, I have prepared several hundreds of prints to see whether lead or mercury would not do as well as the more expensive metals, such as gold or platinum, for toning purposes, to withstand the destructive action of the sulphur in the atmosphere.

I have succeeded in obtaining as good tones, if not better, with lead than I have with gold, and much quicker and easier. But I have never been able to remove the last traces of the lead from the film and fibre of the paper. Every chemist knows the delicate test for sulphur that acetate of lead is. At gasworks they use it for the purpose. But for photographic prints anything that will so readily combine with sulphur is the last thing we ought to have in the film. If we could deposit sulphide of lead or sulphide of mercury on the image *only*, I think they would make good toning agents; but, if they cannot confine their action to that, I say they are unsafe things to use. I have tried lead in every way I could think of—combined lead and hypo baths, fixing in hypo and washing before toning, &c.; but, directly I tested the prints with sulphuretted hydrogen, the lead showed its presence, not only in the film, but in the fibre of the paper itself. I do not say that others have not, or will not, be able to overcome this difficulty, but I do say this, that, unless the last trace of the lead is removed from the film in the whites of the picture, the affinity that lead has for sulphur will make itself apparent sooner or later. To the ordinary amateur, especially the careless worker, it will not make much difference; he is satisfied because he is able to get better results with greater ease and rapidity.

But surely it will be a pity if the gelatino-chloride printing-out process, which has so many and important advantages, should get a bad reputation in a few years.

Years ago I pointed out what a grand thing it would be if one of our societies would seriously take up this and kindred subjects. An investigation of this kind is one that an old-fashioned analytical chemist would not tackle with much success. He could tell how much silver, chlorine, &c., there was in the film. But the physical characte ristics of different samples of gelatine, and their power of controlling the affinity of the silver for chlorine, the action of light on the silver particles, and their mysterious combinations with organic matter dur ing their reduction by the light, are all matters that render chemical analysis of little help.

The only means of getting any real knowledge about these things seems to be to base the experimental work upon the practical, and try to find out what laws govern the results arrived at.

For instance, during the past ten or twelve years I have always found that, to get the most permanent prints, the vehicle holding the silver in suspension must be as porous as possible until after it is toned, fixed, and thoroughly washed, or the whites of the picture will yellow and fade when exposed to any sulphur tests. In time I began to obtain a clue as to the reason of this. I found that, in the fixing bath, unless the hyposulphite of soda was in sufficient excess *in the film, i.e.*, soaks into it fast enough to instantly redissolve the hyposulphite of silver first formed, a form of hyposulphite of silver was left in the film, which cannot be afterwards dissolved in the hyposulphite of soda, and this silver left in the film in time combines with the sulphur in the atmosphere, and we get the yellowing of the whites of the print. Of course the reduced silver which forms part of the image is protected by the gold, and does not form sulphide of silver so soon.

I feel convinced that the yellowing of the albumen films is principally due to the coagulated albumen binding up the silver so firmly that some of it is left in the film, not redissolved in the hypo bath; also, that in gelatine films the addition of alum, or anything that tends to harden the film, or prevent the hypo bath thoroughly doing its work, is a disadvantage as regards the probable permanence of the print.

As to the use of alum, it was known thirty or forty years ago that papers that had been sized with gelatine containing alum were less permanent than others. If its use was so injurious when simply used in the sizing of the paper, surely it is not an advisable thing to use with a thick film of gelatine if it can possibly be avoided.

From tests I have made, I believe that a simple combined bath of gold and hypo is safe to use if it is not overworked and the silver and hypo is not allowed to decompose before it is used a second time, a thing to avoid as much as possible.

In some districts it would, no doubt, be better to use a combined bath of this nature than to tone and fix separately, because the impurities (chemical and otherwise) in the water used in washing the prints before toning (through their combining with the silver in the film) are often the cause of serious injury to the prints. I have often seen a sort of film or scum over the image sufficient to injure the brilliancy of the shadows, due to impurities in the washing water.

I hope I have said enough to prove to Mr. Bishop that my statement which he quotes was not made without sufficient investigation.—I am, yours, &c.,

HERBERT S. STARNES.

Bexley Heath, July 16, 1894.

THEORY *VERSUS* PRACTICE.

To the EDITOR.

SIR,—I have read, with some degree of amusement, the article entitled *Letters to a Young Photographer.—I.*, in the current issue of your paper, and, although its author, "Junius Junior," is undoubtedly possessed of a great sense of the ridiculous and no little literary skill, I feel that, if your courtesy will allow, I must call his attention to the fact that no young man of any ordinary ability could possibly read "all the books on photography that have been published," and subsequently be guilty of such a category of mistakes as those he so humorously enumerates.

The pith of the joke against the unfortunate "Richard" appears to be that, notwithstanding "the thoroughness with which he has prosecuted his study of photographic books," he has only succeeded in falling into every possible error that the imaginative "Junius Junior" can conceive. This is all very well as a satire, but it is hardly fair to some of our able authors on photographic technique. Photography would never have developed to the grand art it is to-day without the assistance of the great minds who have published "books" on the subjects of their research.

The thoroughly practical photographer is a very good man to meet, but there is no reason why he should not peruse with interest the writings of men to whom he virtually owes the development of the processes that prove a livelihood in his hands. The optician, the chemist, and the artist have all joined hands and proved his counsellor and guide, and should be regarded by him with deference and respect. Such, however, is by no means the case among the rank and file of professional photographers.

Trusting that in the future *My dear Richard* will send his instructor some more successful negatives of the *brick wall and rabbit hutch* than the first one appears to have been,—I am, yours, &c.,

Bristol, July 16, 1894. ERNEST W. TAYLOR.

A CALL TO ARMS.

To the EDITOR.

SIR,—I am glad to see there is some talk of "Stores" for professionals' own use. Isn't it the duty and privilege of the National Association of Professional Photographers to do something in this way? What better way of increasing membership and funds could they find? And what better way of helping the fraternity? But they must first become an association of *professional photographers*, and strike out the pressman, manufacturer, and wholesale (?)—serve anybody—man, and their representatives.

I am glad to see one of the wholesale drug houses has started a photographic department, and no doubt others will follow, and, of course, this will draw off the trade of chemists from the stationers, who have appropriated our business. Let photographers also boycott these firms, who have done so much harm. There is room for an enterprise to serve photographers only, and there is money in it, ay, and make their own, too. The makers are in the same boat with the wholesale (?). What would grocers and drapers say if we could write their wholesale houses or their manufacturers and buy pounds of tea and yards of calico?—I am, yours, &c., NEMO.

July 9, 1894.

To the EDITOR.

SIR,—For some years past there seems to be a periodical onslaught against amateurs. It is a sort of madness that seizes certain individuals, and which often develops into "amateurphobia." After the disease has lasted some little time it dies out, only to break out again at some future time; but now it has gone past the amateur, and we have "plate-maker-phobia."

Boycotting is proposed as one of the remedies. Boycotting is, in my humble opinion, a conspiracy to ruin certain persons, but there is not the slightest fear that photographers as a body will ever carry out anything so unfair and debasing. Besides, plate-makers who supply a genuine article have nothing to fear, simply because photographers, whether they be professional or amateurs, generally seek the very best plates in the market.

As to amateurs, sneer as the professional likes, they still will come, and some to the very front.

At Henley regatta last week there were hundreds of amateurs, more than ever seen before. A gentleman there, interested in photography, from the Isle of Wight, whose name did not transpire, in speaking of the benefit of amateur work, instanced West, of Southsea, who, he said, was, once a plumber; while Dore, of Shanklin, who has latterly shined forth, is a watchmaker, who began with a 2*s.* 6*d.* article. Of course, this is open to correction, but are they not now in the front rank of artistic photography?

Instead of calling to arms and boycotting plate-makers, try to rise above the ordinary amateur. It is no use railing out against them, they are here and have come to stay.—I am, yours, &c., S. E. K.

MR. CHADWICK IS BETTER.

To the EDITOR.

SIR,—Permit me to thank your contributor "Radiant" for his kindly notice of me in your issue of July 6. I have had a shoal of inquiries as to my health since then.

It is quite true that I have been considerably indisposed, though nothing more than the result of over-work and trying to burn the candle at both ends. However, I am better now, and on the war-path again.

There is just one little matter I should like to say a word about. "Radiant" and somebody else, I believe, have referred to my "humorous advertisements." I assure you, Sir, that I did not mean them to be humorous; I intended them to be *serious*, and, for a further explanation, I would refer you to the advertising pages of this issue.—I am, yours, &c.,

W. I. CHADWICK.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

LONDONER.—Received.

HENRY HOLMAN.—Received.

"ONE IN EARNEST" has omitted his name and address.

O. O.—Send us a sample of the medium, and we shall be pleased to try it.

F. N. B.—Send two copies of the photograph and 1*s.* 7*d.* to our publishers, who will effect the necessary registration for you.

HANTS.—The simplest of all photo-mechanical processes that you can practise with is photo-lithography. It is well suited for fine-line subjects such as those you have to deal with.

S. E. DAVIES.—We cannot answer queries on medico-electrical matters. We may, however, tell you that, when sulphuric acid is added to water, considerable heat is always evolved.

E. A. D.—1. The lenses named can, we believe, be obtained of Messrs. Marion & Co., Soho-square.—2. We think that Messrs. Sands, Hunter, & Co., Cranbourne-street, Leicester-square, let out large cameras on hire.

A. H. STICKELL.—We know of no one who makes a speciality of building "photographic saloons" on wheels. We imagine that any omnibus-builder, or those who construct gipsies' caravans, would construct a photographic saloon to your design.

W. H. C.—We do not at all think you can recover a week's wages. As you were told to come for a week on trial, by telegram, and that was rescinded within an hour afterwards, we do not see what ground you can have for demanding a week's wages.

THOS. JONES.—If the collodion was properly compounded, it would not behave as described. We cannot, of course, indicate what is the fault. Better get some collodion ready for use from one or other of the manufacturers. You can then rely on having the proper thing.

BURIN.—Holes in the plate, sometimes termed "devils," are frequently met with by novices after the image is etched in. But experienced workers are now seldom, if ever, troubled with them. They, as a matter of business, we suppose, do not publish the means by which they avoid them.

J. A. FRAZIER.—Use a thin solution of any good white gelatine, immerse the prints in it, and squeegee them on the glass in the ordinary way. Use the special colours sold for the purpose. They may be obtained from any of the large dealers. The method of mounting "opalines" has been so frequently described, that we cannot go fully into the matter in this column.

S. PROCTOR.—There is no "standard." There are various systems of testing plates, each of which has its advocates. The Photographic Society of Great Britain have appointed a Committee to consider the subject, but the result of their investigations must be waited for. Each maker has a standard of his own, and, naturally, prefers that to all others until something better, to his idea, is introduced.

C. SCHMIDT asks if the National Association of Professional Photographers would not do well to establish a rule with regard to resitting for portraits. He says that sitters are becoming more and more exacting, and, however good the portraits may be, they now expect to be taken several times, often in different dresses, merely to see which they like best.—Our correspondent should bring the question before the Association, for there is no question that sitters are often very exacting. The question is, however, a difficult one to deal with, as competition is very keen in the portrait business.

R. W.—A mistake. Glycerine can be mixed in all proportions with alcohol as with water.

THOS. NEWELL says: "I have been informed that a new law has been passed, and photographers are not now allowed to copy photographs taken by other photographers, and not to be mounted on printed cards. I have been informed I can place them on plain cards. Please let me know if that is a fact.'—No new law has been passed. No one can legally copy another photographer's copyright work, whether the copies are mounted on printed cards or otherwise.

WARDER.—We can quite understand that, on assaying the ashes from gelatinochloride paper, they were found to contain so little silver. But we cannot agree with you that it is "little less than a fraud" to supply paper with so little silver in it. You purchase the paper to produce pictures upon—that is its primary purpose—and not to recover silver from its residues. With albumen a larger proportion of silver is necessary to produce good prints than is the case with gelatine emulsion papers.

T. A. W. writes: "Last year a large firm took a number of views in this neighbourhood and published them. In the spring of this year I, as an amateur, copied two or three views of one of the churches, exteriors and interiors, and supplied prints to a bazaar that was held soon afterwards, at a less price than the firm sell theirs for, to benefit the charity. I ought to mention that the views were not marked "copyright." Now the firm is threatening me with legal proceedings for what they term infringing their copyrights. Can they take proceedings, as the prints I copied were not marked copyright, and how was I to know they were so?"—Certainly they can, and recover heavy penalties. There is no necessity to mark prints copyright. Any one pirating them does so at his own risk. He should ascertain whether they are copyright or not before he copies them.

FRANK BRIANT says: "The enclosed picture was taken from a very small gem likeness, and I enlarged it, as you see, to cabinet. The question I wish to ask is the cause of the blue spots appearing on face of picture, as there was no sign of anything upon nine out of one dozen that I printed. All the pictures were printed from off same sheet of paper, toned and fixed same time, and no sign of anything till after burnishing, when three out of one dozen became spotted with blue splotches, as you see. I used acetate toning bath, and fixed with hypo bath of usual strength, and have never been troubled with anything similar before. Kindly inform me cause."—The spots are due to imperfect fixation in those parts. Probably the prints sticking together in the fixing bath, or air bubbles adhering. The heat of the burnisher, no doubt, made them more pronounced, as might have been expected.

BROMIDE writes: "I have a ten-inch-focus portrait lens marked 'L.C.,' which I understand was made by 'Coiffier,' of Paris. Although on the glass screen a well-defined and sharp focus can be obtained, the resulting negative is deficient in sharpness—the principal focus seems to have fallen back a few inches. To test it, this morning I placed a sheet of advertisements on a screen, and another on a head rest three inches behind. I sharply focussed the first sheet and exposed a plate, with the result that the sheet of advertisements on the head rest three inches behind is well defined, while the one I focussed is blurred. I enclose rough print off same. I suppose it is a case of the foci of the lens not agreeing. Of course, I know the difficulty can be got over by racking the lens out about one-sixteenth of an inch after focussing, but I should feel more confidence if I could see the result on the ground-glass screen. Is there any means of accomplishing this?"—It is clear that the optical and visual foci do not coincide. If the lens be racked out, the difference between the two after focussing—and this is a very easy matter—good pictures will be obtained. Or the ground glass may be set back in the focussing screen corresponding with the difference. These are both very simple methods of overcoming the difficulty. Another way is to have a supplementary lens that will alter the focus of the combination the necessary quantity, to slip between the lenses after the visual focus has been adjusted.

*** Owing to pressure of Convention matter this week, several answers to correspondents and other communications are held over.

NOTICE.

With this number of the JOURNAL *we present our readers with a collotype group, by Messrs. Morgan & Kidd, Richmond, S.W., of the members of the Ninth Annual Photographic Convention of the United Kingdom, assembled in Dublin on Wednesday, July* 11, 1894. *Mr. R. L. Kidd took the negative. A Numbered Key, with the names of the members, is also given.*

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THE BRITISH
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NFLUENCE OF DIAMETER IN SINGLE LANDSCAPE LENSES.

a landscape lens of, say, eighteen inches focus and only one ch in diameter will cover a plate twelve by ten inches in mensions, of what use will it be to increase the diameter of ch lens? This is a form of question which has, we know, ten simmered through the minds of many photographers, th experienced and inexperienced.

Let us look at this question from an ordinary practical point view. Probably every one knows, or ought to know, that e centre of the picture is produced by the centre of the lens, d that its margins are likewise formed by the margins of the ns. It is quite true that a lens of small, even the smallest acticable, diameter may be made to cover a plate sharply to margin by a proportionate reduction of its stop, but such op will have to be very small indeed to effect this. The naller the diameter of the lens, the smaller must be the stop diaphragm which is necessary to fulfil the condition of equal arpness throughout, and a very small stop is subversive of l rotundity in the objects included. It gives a map-like, flat arpness only.

An improvement in this respect takes place by the employ-ent of a larger working aperture, but, in proportion as this is tained, so is all marginal definition degraded, until eventu-ly it becomes little else than a blur.

With a lens of larger diameter this condition of things is tered. The stop is placed at a greater distance from the rface of the lens, its mount being longer to permit of this eing done. Here lies the advantage—marginal definition an be obtained with a stop *very* large in comparison with that ecessary for securing an equal degree of sharpness with the naller lens. Hence much greater pluck and rotundity of the bjects in the picture, and a greater rapidity of action. This ermits also of groups, and even portraits, being obtained in a ght which, with a lens of smaller diameter, could not easily e obtained without a long exposure, which, as we all know, hostile to immobility in the respective sitters.

This states the case for large lenses; but, the larger the iameter of the lens, the more conducive is it to the distortion f curvilinearity of the subjects as they near the margin, for he smaller the lens is the less is the distortion. Let this be ested in the following way. Direct the camera to a square uilding that nearly fills the plate, and take a picture, or even bserve it on the ground glass, a large lens being employed. he distortion of curvilinearity will be noticed by the vertical ines at the margin being more or less slightly curved, instead f being absolutely straight. Now let the stop be pushed up closer to the lens (if the mount permit), and two things will be observed: the curvature of the marginal lines will be sensibly diminished, and the definition of the picture at the margins will be less pronounced than it formerly was, necessitating the employment of a smaller stop to bring it up to the former sharpness. Once again push the stop as close up to the lens as it can go, and the same thing is observable in a still greater degreee. The distortion of curvature will have nearly vanished, but the sharpness is now confined to only a small space in the centre of the plate, necessitating a serious diminution of the diaphragm aperture in order to obtain passable sharpness all over the surface.

There is still, theoretically, a residuum of distortion, although such may be unnoticeable, because, in order to obtain absolute freedom from curvilinear distortion, the stop will have to be placed at the nodal point, which, in the case of a lens of plano-convex form, may be assumed to be at the convex surface of the lens, which is totally subversive of definition, unless a very small stop indeed, one of the pinhole order, were employed, in which case it would be rectilinear.

From what has been said, it will be perceived that a single lens of a large diameter will cover more sharply with a large stop than a similar lens of smaller diameter, and hence that it will be better adapted for certain purposes than one of less diameter, unless such is considerably stopped down, entailing, of course, a longer exposure, in consequence of the diminution of light. It will also be seen that, with their stops in their relative places, as determined by opticians, the smaller the diameter of the lenses, the more near will be the approach to rectilinearity. For a group the large lens will have the advantage; for a building (unless it is kept in or near to the centre of the field) the small lens will prove the better.

The late Thomas Grubb, F.R.S., recognised these matters very thoroughly, for he constructed his lenses with mounts in which it was possible to approximate the stops to the lens, thus enabling the operator to cover a larger area or include a wider angle of view, using a smaller stop, of course, or a less angle with a large stop. Some French makers also did this, but in a much less elegant manner, mechanically, than did Grubb.

THE DETECTION AND ESTIMATION OF THE HALOGENS.

The subject of the detection and estimation of chlorine, iodine, and bromine, if one of continual interest to chemists, is doubly so to photographers. We need only quote the often-expressed desire to know how readily to ascertain the proportion in

which the respective silver salts are present in a particular sample of dry plate. We have from time to time brought before our readers' notice variations from the classical methods of making these determinations and estimations. Quite recently, however, an entirely new set of methods has been proposed, and they contain such elements of promise, that we feel that they should be brought into photographic cognisance at as early a date as possible. We will first give M. R. Engel's method of detecting chlorine as given in a recent number of *Comptes Rendus*. It will not be necessary to give his preliminary remarks upon the recognised methods and the difficulties in connexion with them; the process itself is as follows: "I have been able to effect the separation of chlorine and bromine in a complete manner by the action of ammonium persulphate . . . . now to be met with in commerce in a state of great purity. . . . We dissolve from 1 to 2 grammes of the mixture of alkaline chloride and bromide in from 150 to 200 c.c. of water, and add to the solution from 3 to 5 grammes of the ammonium persulphate. The mixture is heated to 70° or 80° and a current of air is passed into the liquid, which carries away all the bromine." About an hour is needed for this operation. To estimate the bromine, it is carried as it is driven off into a solution of dilute sulphurous acid and determined either as silver bromide to be dried and weighed, or, after destroying the excess of sulphurous acid by neutralising the liquid, thrown down by a standardised nitrate of silver solution, using chromate of potassium as indicator. The method is accurate to the extent of a tenth of a milligramme. Ammonium persulphate may likewise serve for separating the iodine of the iodides in the presence of chlorides and bromides. In the cold and in presence of sodium acetate all the iodine of the iodides is precipitated by the persulphate without setting free the smallest traces of bromine or of chlorine.

We now come to the methods of Messrs. A. Villiers and M. Fayolle, published in the same journal. Leaving also aside their preliminary remarks about the difficulties of the old methods, we find them saying of chlorine, "The method which we propose is more convenient in application, giving constant results, and having a sensitiveness almost indefinite, to the extent of a tenth of a milligramme, in the presence of even a thousand times as much bromine and iodine. . . . . It is founded upon the difference of the action of the halogens upon an acid solution of aniline. . . . . We finally adopted the following formula:—

Saturated solution of colourless aniline	400 c.c.
Glacial acetic acid	100 „

"This liquid may be preserved indefinitely in yellow bottles without becoming coloured." (We may here point out that aniline is liable to become red when exposed to air, and is but slightly soluble in water.) "The liquid under examination is brought, by evaporation, or by the addition of water, to the bulk of 10 c.c., and placed in a flask. We add 5 c.c. of a mixture of equal volumes of sulphuric acid and water, then 10 c.c. of a saturated solution of permanganate of potassium, and heat gently, turning the gases into 3 to 5 c.c. of the reagent contained in a test-tube immersed in cold water. In the absence of bromine and iodine, we obtain thus, with ·1 milligramme of hydrochloric acid, a blue colouration, which is transformed (slowly in the cold, but rapidly in heat) into a more distinct rose colour. If the dose of hydrochloric acid increases, we obtain either a black colouration (very intense with 1 milligramme), or a black precipitate. The phenomena are different in the presence of the other hydro acids. In the propor indicated, the iodine is completely oxidised, and does not over in distillation, the bromine carried over forms, with reagent, a precipitate; other chlorine liberated colours the agent as well as the bromine precipitate, but there is for at this same time bromine chloride, which does not act chlorine, and which considerably diminishes both the certai and especially the sensitiveness, of the reaction. Still, we h obtained the following results:—

HI alone	No reaction.
HBr alone	White precipitate colourless liquid.
0·015 HI + ·05 HBr + 05 HCl	Deep blue liquid, then violet liquid; black precipitate.
+ 0·01 HCl	Liquid and precipitate blue, and then deep rose.
+ 0·003 HCl	Bluish tint, then distinctly rose.
+ 0·001 HCl	Appreciable tint, rose after some time.

The last colouration is very faint, and nothing is obser on further dilutions. Thus we see these results are suffici to detect the presence of chlorides in a great number of c mercial bromides and iodides. In like manner, on adding once bromine water to the reagent, the colour of the precipit obtained can show the presence of chlorine in the bromine the former is in sufficient proportion, as it is often the case commercial bromine.

In a future paper we shall show the means of remedyi this defect (the diminution of sensitiveness in the presence other halogens), "and of obtaining the same sensitiveness in the case of hydrochloric acid alone." We have writt enough to show that we have presented to us processes of ve great value and convenience; but, as the subject is not co plete without giving the further results of Messrs. Villiers a Fayolle with iodine and bromine, we will complete our descri tion in a succeeding issue, in order not to make this scienti record too bulky.

PHOTOGRAPHY AND HEREDITY.

Mrs. Fawcett, the distinguished philanthropist, widow the late Henry Fawcett, and mother of the young lady w some few years ago astonished the world by triumphing ov all her male rivals in the Cambridge Classical Tripos, appea to have a profound admiration for photography. She has s herself the task of demonstrating that the offspring of high intellectual women—those women, in fact, who are competi with men in the loftier walks of modern knowledge—are n as we suppose it has been alleged, inferior in physical develo ment to the children of women who have not troubled ther selves to acquire any greater mental proficiency than th possessed by the majority of the sex. Photography is Mr Fawcett's witness for the defence. She has had the babies several former lady graduates of Newnham and Girton phot graphed, and has, we are told, presented the series to the firs named college, where, no doubt, it will remain of permane and absorbing interest to succeeding races of "sweet gi graduates with golden hair."

Although we are not informed in so many words, we are enled from the circumstances of the case to assume that each the infants photographed realised, at any rate on (sensitised) per, the delightful ideal of physical beauty with which every ung mother invests her first-born. Still, it only wants a all knowledge of female human nature for one to be able to rceive that, in the sardonic saying of some stony-hearted nic "that there is only one beautiful baby in the world and ery mother has it," there is much point, and even more truth. the other hand, to the average man one baby is very much e another, and we are inclined to believe that photography es not exercise any greater degree of discrimination in the me regard.

With every deference, therefore, to Mrs. Fawcett and her teresting lady friends, we should be surprised to find that r photographs of these scientifically descended infants proved ything worth proving. They do not even prove that the fants are what they are probably shown to be, viz., plump, ell-formed, smiling little babies. Mrs. Fawcett is, doubtless, naware that it is quite within the powers of photography to npart seeming physical beauty to subjects, both infantile and ature, not actually possessing it. Moreover, if the photoaphs are really tolerably faithful representations of the points" of the little people, the mere fact that a small umber of the descendants of science and culture have been ell favoured by nature instead of being, as shallow and unrepective persons would imagine, comparatively gaunt and ustere, is of trifling importance. From the point of view of Weissmann's theory of heredity, it neither proves nor disproves nything of the slightest scientific value.

It has been the fashion with many to indulge in pleasantries t the expense of very intellectual women, and to predict the ecadence of the species as a result of the growing worship f mind that so many of the fair sex now indulge in, and it is ossibly people of this kind that Mrs. Fawcett has had in view n organizing her collection of photographs. If that is so, hen the photographs may, after all, serve some useful purose; but the fact that they have been gravely deposited in ne of the Colleges of the University points to the view that much higher value is set upon them. That value, we enture to think, they do not possess, unless they have been aken to anthropometrical scale, and are accompanied by particulars of frontal and cerebral development, and such other letails as are likely to be of some scientific interest. Mere uperficial good looks, again, in an infant are a neglectable uality which possibly such rare-minded ladies as Mrs. Fawcett nd her University-trained friends would not take into reckoning at all.

It is a pretty compliment that Mrs. Fawcett pays photoraphy in this entertaining little experiment, and we are sorry o think that, in succeeding ages, that experiment will infallibly e characterised as a worthless one. We are pleased to know hat erudite mothers can, and do, have nice babies, and, for the ake of the photographic profession, we welcome photographic vidence of the fact. Indeed, on behalf of that profession, we ope that Mrs. Fawcett and others of her kind will have the abies of bricklayers, coal-heavers, professional pugilists, city lerks, farm labourers, colliers, in fact of all classes of the ommunity, at once, and frequently, photographed, so as to rrive at the exact influence which the occupation of the arents has upon their progeny. This would be very beneicial to professional photographers, and do no harm to anybody. As for the infants whom Mrs. Fawcett has already had photographed, we hope the boys will develop into muscular men, and the girls into good and handsome women, despite the undoubted fact that pretty babies often make plain adults, and *vice versâ*.

ENLARGEMENTS ON A LIMITED SCALE.

II.

Next we come to the production of the enlarged negative, for which purpose we have the choice of gelatine plates or films, carbon tissue, or gelatino-bromide paper. No doubt each individual will follow the particular process he happens to be most familiar with, and it may be said that each of those enumerated is capable of giving first-rate results, supposing it, of course, to be properly worked. We need not here go into the details of working any of those processes, as they are sufficiently familiar to most of our readers. The plan we are about to describe is, however, given as being at the same time extremely simple, thoroughly effective, and withal excessively cheap, especially for large sizes.

The enlarged negative in this case is made upon a basis of albumenised paper, though not in its usual form as employed for direct printing, which would be far too slow. If, however, the ordinary albumen-chloride paper be treated with a solution of a soluble bromide, the silver chloride is converted into bromide, and the paper becomes much more sensitive as well as capable of development, and, if prepared according to the following instructions, it will be found to give more uniform results for negative purposes than any of the gelatine papers specially prepared for positive work. At the present time we are not aware of any special negative paper in the market; hence we give the method of preparing this in some detail.

Select a good sample of Rives paper, not necessarily a highly glazed, but preferably a fairly highly salted, one. Sensitise it on a bath of sixty-grain strength by floating the *plain* side, taking great care that none of the solution gets on to the albumen side. The floating must be continued for a much longer time than if the paper were intended for positive purposes, the conditions and requirements being altogether different. For positives, the object is to keep the image entirely on the surface or in the albumen film, whereas here we want to form the image in the body of the paper as well as to allow the solution to penetrate sufficiently to render the albumen insoluble, which it can only do after the chlorides are converted. To ensure the complete action, it is therefore necessary to float for at least five minutes, after which the paper is drawn over the edge of the dish or a glass rod and hung up to dry. It is not absolutely necessary to dry it at this stage, but it is better, as it ensures the perfect coagulation of the albumen, which is desirable.

When dry, the paper is again floated, this time albumen side upon a twenty-grain solution of bromide of potassium, to which about five minims of strong ammonia have been added to each ounce. After floating for five or six minutes, the sheet may be lifted and reversed, the plain side being laid downwards, or it may be altogether immersed and left for another five minutes. The ammonia may be omitted if preferred, its function being to increase the sensitiveness; there need be no fear of its causing stains, as the soluble nitrates contained in the paper will dissolve any oxide of silver that might otherwise be formed.

The final operation consists in thoroughly washing the paper until it ceases to show any traces of free bromide, after which

t is ready for exposure either before or after drying. If required for immediate use, the paper may very conveniently be prepared and exposed while still wet, especially in cases where the process is only worked at occasional intervals. It is then easily laid flat upon the easel or upon a sheet of glass according to the circumstances under which the exposure is to be made, and for merely occasional use this is the plan we should recommend.

There is no reason, however, why a stock of paper should not be prepared at once, as it will, if properly washed, keep practically for an indefinite period, and, if frequently required, this will save much trouble. It will be desirable in the case of drying the paper, if not indeed absolutely necessary, to adopt means to overcome the inveterate curling and unevenness of the albumen paper, as otherwise it will be next to impossible to obtain a level surface on which to focus. The simplest, and at once the best, plan for effecting this end is to lay the wet paper, after its final washing, between sheets of clean bibulous paper, and to go over it with an ordinary flat iron, not too hot. It is not necessary to continue the application of the iron until the paper is perfectly dry; indeed, the reverse is perhaps preferable, as, if completely dried, there will still be a considerable amount of "curl" in the paper, though not the unevenness there would be if dried without this treatment.

On the other hand, if the heated iron be applied until the paper has become perfectly smooth and nearly dry, it may be put away between sheets of perfectly clean dry blotting-paper, to become thoroughly desiccated. If the blotting-paper be thoroughly dried at the fire, and used warm, the sensitive paper will be quickly deprived of its final moisture, and will lie perfectly smooth and flat, and without any tendency to curl. If it is to be kept for any length of time, it should be removed from the blotting-paper in which it was dried, and stored by itself, or between sheets of perfectly dry paper, under pressure. In this state it will keep in good condition for a very long time.

Of course it will be clearly understood that paper prepared in this manner will not compete in point of sensitiveness with the more rapid bromide emulsion paper, although, if care be devoted to the operation detailed above, a very fair degree of speed may be obtained, and the quality of the image will be all that could be desired. The average degree of rapidity will be, if the newer developers be used, about equal to some of the slower kinds of gelatino-bromide paper.

Nothing need be said here regarding the exposure of the paper, as that will differ in no respect from ordinary gelatino-bromide, and we may pass directly to development, simply remarking that extreme accuracy in timing the exposure is not of so much importance as when a positive enlargement is in question. Of the developers available for the purpose we give the preference to amidol and metol, or to a combination of one of these with hydroquinone, employing a fair quantity of bromide to hold the action well in check.

It may be well to give a word of warning to those who are unacquainted with the peculiarities of paper negatives, that the image, as compared with one on glass, possesses far more than its apparent printing value, and that therefore care must be taken not to over-intensify, or to carry development too far. A full exposure and quick development to get out all necessary detail will usually produce the best result, but of course the transparency must be of such a character as to permit this.

The negative, after fixing and washing, is finished off by ironing, as already described, in order to render it perfectly flat, and is then ready for printing. If the paper is of good quality and texture, it need not be waxed or otherwise rendered translucent; but, if at all uneven, it will be better to apply either wax or oil-vaseline. The unwaxed negative will, of course, take longer to print, but the final result will be generally better and more even.

Picture Sales.—Reference has more than once been made to the depreciation just now in the value of works of art, more particularly "old masters." At a recent sale of some of the Duchess of Montrose's pictures, a portrait of Madame Le Brun, by T. Gainsborough, fetched 3100 guineas, and one of Mrs. Mathew, by Sir Joshua Reynolds, was sold to Mr. Agnew for 4400 guineas. With the great depression in the picture market, it is gratifying to find the value of British artists' work so well maintained.

Stability in Photographs.—What can be taken as a standard of permanence in photographs? The question is one of no little importance now that there are so many new processes before the photographic world. Because some prints by the new methods have stood unchanged for many months, and even for a few years, we are asked, on the strength of this, to accept these processes as being stable. On the other hand, there are thousands of prints by the old, and much-abused, albumenised paper process, that were made thirty, forty and more years ago, still as good as ever; yet this process is condemned because it does not yield permanent results. This, again, brings us to the question of what is photographic permanence, or is there such a thing in connexion with silver printing?

Temperature and Sensitiveness.—The paper read by Dr. Joly at the recent Convention *On the Influence of Temperature upon the Sensitiveness of the Photographic Dry Plate*, directed prominent attention to a subject which, though not new, has received but comparatively little attention on the part of users of dry plates. The paper is opportune now that so much is being said in some quarters about the different systems of testing the speeds of plates. The temperature of the developer has always been recognised as of importance, but not that of the plate at the time of exposure. The temperature employed by Dr. Joly was, of course, abnormal, and the effect was great, but there is little question that even the ordinary variations of temperature do have their effect, and that has long been known to observant workers. The effect of extreme cold on the sensitiveness of plates and films in practice will be another interesting photographic point to learn on the return of the various Polar expeditions.

Photographers and the Factory Act: a Caution.—Occasionally we have been asked if photographic establishments, employing a number of hands, come within the Factory Act. There is no doubt, or ever has been, on the subject, though some seem to imagine there is. Last week, a well-known London company, who do the greater part of their work, as other similar concerns do, a little way out of town, were summoned at a suburban police-court for breaches of the Factory Act. The gentleman engaged in the prosecution said, "the Home Office thought this a serious case. The Act stipulated that the maximum number of hours that could be worked was twelve per day, and there must be not more than five hours without an interval for meals. He found there were fifteen girls at work from 6 a.m to 7 p.m. with only twenty minutes for breakfast instead of half an hour. At one o'clock they had dinner, and there was no break then till 7 p.m. They worked an hour a day more than they should." The Bench inflicted penalties of 40*s*. We give prominence to this case for two reasons: First, to remove any doubt that some may have with regard to the Factory Act as applied

to photography; second, because we know there are establishments, particularly in provincial towns, where the hands are employed for as long as, and even longer than, in that which has just been fined.

Residues.—*Apropos* of the articles on residues and their value a correspondent writes to this effect: Seeing that the modern dry plates contain so little silver, and the ready-sensitised papers, especially those of the emulsion type, are so devoid of recoverable metal, while the ash from them is proportionately so much heavier and more bulky than that from albumen paper, are the residues worth saving? or, as our correspondent puts it, "is the game worth the candle now that the metal, after all the trouble of saving and the expense of reducing, carriage, &c., realises so little per ounce?" The question is certainly a pertinent one, particularly when taken in connexion with some of the complaints we have from time to time received. The trouble of saving wastes is not great, neither is that of collecting them and preparing them for the refiner, but nearly as much trouble and expense in reducing and carriage is involved with a small quantity as with a large one. Hence it will be seen that in some cases, as several correspondents have complained, it is unremunerative to send the residues in small quantities at a time to be reduced, especially if they contain much extraneous matter through not being carefully collected; but, when the wastes are allowed to accumulate until there is a good quantity to deal with, the game *will* certainly be well worth the candle. Moreover, there is the possibility that silver may increase in value, though there is very little probability of its doing so to any material extent.

Photographs of the Moon.—At a meeting of the Paris Academy of Sciences on July 8, MM. Lœwy and Puiseux exhibited some marvellous photographs of the moon, obtained by means of the great *coudé* equatorial of the Paris Observatory. In the communication which accompanied the photographs, the advantages of multiplying good lunar photographs were pointed out, and the various methods employed in the work were passed in review. One of the enlargements on paper, shown to the Academy, represented the moon on a scale of 1·80 metres for its diameter, and five lunar pictures on glass were exhibited at the same time. Some years would be required to make a drawing showing all the details visible on one of the plates obtained with an exposure of about a second. The negatives are larger than those obtained with the Lick telescope, and they bear considerable magnification without loss of definition. But such negatives cannot always be obtained. MM. Lœwy and Puiseux say that, of fifty or sixty evenings employed in lunar photography, only four or five gave really first-class results. A complete series of negatives, tracing the moon through its phases, has not yet been obtained at Paris, but what has been done has furnished material for experiments in making enlargements. This part of the work is really as important as that of taking the negatives. From the results, MM. Lœwy and Puiseux conclude that a complete lunar atlas of the dimensions proposed by Prof. S. P. Langley can be made by means of the great *coudé* telescope at the Paris Observatory without the expenditure of much time and work.

DUBLIN CONVENTION NOTES.—I.

(*By our Special Correspondent.*)

Now that the Dublin Convention is over, as recorded in the previous issues of the JOURNAL, some few things still remain on which a special note may be founded.

"Dear, dirty Dublin" is unmistakably a fine city, no doubt of that. Its streets, some of them at any rate, are superb. Sackville-street is much wider than anything London, Edinburgh, Manchester, or Glasgow, can boast of. It is divided by the Liffey, a river which, especially at low water, can make its presence known through the olefactory organs, and is spanned by several bridges, one of which (O'Connell Bridge) surpasses greatly in width anything of the kind of which London can boast.

The meetings of the Convention took place in that part of Dublin south of the Liffey. The Photographic Society of Ireland has large and convenient premises in Dawson-street. The meetings were fairly well attended, at any rate as well as could have been expected after a day's outing, which might well hold excused those who participated in it from desiring to do anything but enjoying that evening repose which was, doubtless, considered to have been well earned.

The opening meeting was held in the magnificent premises of the Royal Dublin Society, Kildare-street (in near proximity to Dawson-street), and the conversazione in the Museum adjoining. This Museum, I may remark, is one that is singularly attractive and perfect, and would well repay a visit of many hours' examination and study instead of the mere walk through, which was all that could be devoted to it on the occasion under notice.

But in what language can I characterise the attention paid by the warm-hearted Dublin photographers to the ultra Erin members of the Convention? This trait in these men of Dublin was the theme of conversation everywhere. One gentleman prominently brought into the foreground in this connexion was the Local Secretary, Mr. John A. C. Ruthven, who was here, there, and everywhere in studying our comfort. No sinecure work was his, for a certainty; but it was done so energetically, and withal so pleasantly, that I must retract what I was about to write to the effect that he has no reason to thank his stars he ever accepted the offer, for I verily believe Mr. Ruthven would do it again did occasion ever arise.

Some few years ago opinions were very strongly expressed as to the impropriety of allowing the Convention being made the medium of advertising trade productions, and this in private circles has been expressed with equal forcibleness on the attempt made and carried out by Mr. Hepworth in taking advantage of the Convention to advertise a certain thing in which he has a proprietary interest. It matters not at present whether he was aware or not aware that his "invention" had been for years known to the photographic world, by one of whom it had even been patented seventeen years ago. The principle involved is that he took advantage of the Convention to advertise it in a paper read before them. This ought to be a lesson to the Council to insist that no paper whatever shall in future be allowed to be read that has not passed an examining committee. The introduction of shop and the resuscitation of old matters as new tend to lower the status of the Convention.

What Wilson & Valentine are in relation to Scottish scenery, that is Mr. W. Lawrence in regard to the scenery of Ireland. His pictures meet one at almost every turn, and in every city, town, and village. In course of my walks through Dublin, I visited his headquarters, which are situated at 5, 6, and 7, Upper Sackville-street, also having business premises at Grafton-street. His printing works are situated at Williams Park, Rathmines. He is the sole proprietor, but he has associated with the business his eldest son, Mr. Arthur Lawrence, who will be remembered as having been at some of the previous Conventions. His photographic business consists of two parts. He is the principal publisher of the scenery and antiquities of Ireland, and has from 150 to 200 agents appointed at all the principal tourist points throughout Ireland. His collection of negatives of Irish scenery amounts to over 17,000; and each one of these different views has a separate portfolio and number, so that, notwithstanding the quantity, any subject can be laid hands on in a second, the whole arrangement in connexion with the tourist trade being well organized. A strong feature in connexion with the photographic tourist trade at the present time is that the railway companies of Ireland are largely availing themselves of photographic views as a means of advertising the scenery connected with their systems. A very special feature in this way was made at the World's Fair, Chicago, when seventy enlarged views of Irish scenery were sent out by the associated railways, each view measuring 4 by 3 feet. Also a recent feature connected with the railway companies is a cover for time tables, which he has designed, had the blocks made, and had specially printed for the Great Southern and Western Railway of Ireland; that is, the "Killarney line."

The portrait department is also of an an extensive character. The arrangements of studio, reception-rooms, waiting-rooms, &c., are extensive and handsomely fitted up. They have, during last year (1893) taken nearly 4000 sitters. There is also in connexion with the business a bazaar, and they employ about fifty hands altogether. A large collection of lantern slides of Irish scenery is also kept in stock. These are also put up in lecture sets.

MY FIRST PUPIL.

A PHOTOGRAPHER does not easily forget his first pupil. During a busy career many may offer themselves, and out of the legion there need be little wonder that a large proportion of them are completely forgotten. But the first one—never. At least that is my experience, and a comparison of notes with many old photographers confirms this statement, and enables me to be thus emphatic.

Memory's slate is so full, that much matter is crowded out for want of room, but the events connected with a man's start in life remain quite fresh and readable. With me the sponge of oblivion has smudged out much, and happily so, but all the circumstances connected with the advent of my first pupil are as fresh as ever.

His arrival was most fortunate for me, for I was at that precise moment unmistakably hard up.

My first start in London as a photographer had taken place in the far east. But, though an eastern by birth, if the accident of being born in one of the eastern counties could make me one, still the ways of the oriental cockney did not agree with me, and I was therefore completely out of my element.

One day, by accident during a journey along one of the western arteries of London, an announcement that the upper floor of one of the houses with photographic studio was to let. Here at length, thought I, was my opportunity for escape from my uncongenial surroundings.

In a very short space of time I was in possession of my new quarters, and it was with a beating heart, but expectant spirit, that I crossed the street to watch the effect of my show-case—which was to take London by storm,—on the busy throng everlastingly passing my open door. Strange to say, though occasionally a wayfarer was arrested for a moment, there was no eager crowd to block up the pavement and render the services of a policeman necessary. When I crossed the street I was strung up by excitement, but after a brief space of time was let down far below concert pitch, and hurried back to my den to hide my disappointment. I was lucky enough to have a sitter on the first day of my opening, but business was fitful and uncertain, and the well-known line was ever in my mind, "Learn to labour and to *wait*."

The rent for my west-end quarters was heavy in comparison with east-end prices, and therefore the arrival of photographic victims was waited for with the keenest anxiety. It is scarcely necessary to say that, when a real live pupil offered himself, my joy was not small; but when, after the terms were arranged and an appointment made for the next day, he gave me his card and I saw that, not only was he a commander in the navy, but in front of his name stood the abbreviation which does duty for "Honourable," I was simply awed. There was no necessity, for he was quaintly genial in his manner and extremely affable; but I had never mixed with the "quality," and it was therefore altogether a new experience, and I could not help it.

The new pupil, absolutely of his own accord, paid down half the amount arranged for the course. This sum was a complete windfall, and I eagerly looked for the morrow when I was to begin to earn it. In due course he arrived, bringing with him a small brown paper parcel. This he carefully opened, and with deliberation unfolded a bibbed apron made of a black glazed material.

"I am told," said he, "that this photographic business is a dreadfully dirty one, and I have come prepared for the worst, for I am very particular about my clothes, and don't mean to get them spotted with that black what-do-you-call-it stuff that they say you must use to make the pictures." I could quite believe his statement, for, though there was not the slightest trace of the dandy about him, there was an old-maid—or rather, old-bachelor—primness about him that quite carried out his statement.

There is no need to go into detail as to his success or non-success as a pupil. He was completely satisfied, and that was a material point, at any rate.

A few days after our commencement he came in, radiant with joy.

"I have brought you a very useful little present," said he, undoing a rather more bulky brown-paper package than the first, which he had carried with the greatest of care, as though it contained something breakable. "The other day I had some workmen in the house, and I was very much struck with a brown-paper cap worn by the carpenter. It looked a very ingenious contrivance, and exactly the thing to prevent that black velvet thing you put over the head from messing the hair about; so I asked him if he would make me one if I gave him half-a-crown. He really was a most obliging fellow, for he not only made one, but absolutely offered to show me how to make them. This one I have brought you I made myself after only one or two trials, so you see it is not a very difficult operation when once you know how."

It is easy to imagine how completely my "honourable" pupil was transformed when he mounted the paper cap and put on the black apron. Of course, I was compelled to put on the cap to please him, though I did not feel quite at home in it, nor did I think it gave extra dignity to the appearance of a full-fledged photographer.

On this memorable occasion, after the lesson, he asked me to go out and have some luncheon with him. As the restaurant was only a few doors from my place, and my boy could easily call me if by any rare chance I should be wanted, I consented. Before he began to eat, he pulled from his pocket a small bottle, and swallowed some of its contents. I suppose he saw consternation visible on my face, for he said, "Don't be alarmed, it is not poison; but ever since I was on the Chinese station, and drank a soup made of dead Chinamen instead of water, I have been compelled to take this to help me to digest. In fact, I can't get on without it." He then explained that out in the East the water is generally bad, but on this occasion it was simply unbearable; so they overhauled the tanks, and found that some stowaway Chinamen had somehow got into them, and so ended their career. No wonder he wanted the pick-me-up after such an experience. The very thought of it took away my appetite.

My pupil was very prim, not to say finical, in his photographic operations. Among the tools that were necessary for his comfort was a wonderful knife, that was a veritable tool-chest, and during his photographic labours this ingenious instrument was constantly *en evidence*. One day it could not be found, but he made light of the matter, for he felt sure he must have left it at home. A few days afterwards, however, he arrived in a state of great excitement. Said he, "I have given that boy of yours a lesson he will not forget for the rest of his days. Will you believe it? I found him in the street just now whittling away at a piece of wood with that knife of mine. Of course I took it from him."

Said I, "I hope you gave the young rascal a cuffing he is not likely to forget. Of course I shall send him away, for nothing will induce me to keep a thief in my employ."

"Oh, I think you may keep him on after the lesson I gave him," he said.

"Did you box his ears?" I inquired.

"I did better than that," he replied; "I took him by the ear, saying, 'Now, then, you young rascal, come along with me. I'll teach you to take things that don't belong to you, with a vengeance!' I took him off down the street, the young rascal blubbering all the way, until we came to a tool-shop. I dragged him in, and, after selecting a good, strong, useful knife, I handed it over to him and said, 'I hope this will be a lesson to you for the rest of your days. If you want to get on in the world, mind and keep your fingers off other people's property.'"

Who could help being touched by this kindly act? Certainly not the writer of these lines.

After the completion of the lessons I never saw my genial pupil again. His naval duties probably took him abroad once more, and thus I lost sight of him.

Years afterwards, during a visit to a country house, the subject of conversation at dinner was the recent death of Lord B., who had been a near neighbour. My host was full of stories of his eccentric, though always kindly, acts to the poor in his district. The name was not a common one, and I was at once interested in the stories. I felt sure that my "Honourable" pupil and the late lord were one. A question or two soon settled this point. He had been in the navy, and had spent a considerable time on the Chinese station, and, up to the time of his death, had been a vigorous amateur photographer. I added my story of the boy and his knife to the others, when both my host and hostess exclaimed, "How exactly like him!"

VALENTINE BLANCHARD.

JOTTINGS.

"DEAR Old 'Cosmos,'" writes a correspondent, whose letter has been forwarded to me, "what's the matter with you lately? You *are* getting tame and temperate. Can't you get up another row with Jerome Harrison, or H. P. Robinson, or the Salon, or *The Shoptician*,

or somebody else, and give us something hot and tasty that we can understand and enjoy, and not a lot of dry rubbish about chemistry which very few read and nobody comprehends?" Another correspondent, a veteran photographer, and a man of considerable literary talent, whose letter reached me several months ago, warned me against what he called my "besetting sin of journalistic savagery," and also said that "those portions of my monthly contributions to the JOURNAL which were not of a personal nature were the most welcome and instructive." Yet another correspondent asks me to send my humble contributions weekly instead of monthly, and make them as long as they are strong.

But not all my correspondents—at the number of which, were I to reveal it, my readers would be surprised—are as critical and appreciative as the three from whose letters I have quoted. One man who feigns the handwriting of a woman, and who gives neither name nor address, regularly cuts out my "Jottings" and forwards them to me scored over in red ink with such complimentary words as "Bosh," "Rot," "Drivel," which he supplements by polite requests to "Shut up," and "Go and hang yourself." Suggestions to "go for" this, that, or the other person or institution, are common, and one gentleman recently wrote, hoping I would not fail "to write something warm about" two persons who, it was alleged, made themselves obnoxious to the members of a certain London Photographic Society. One letter runs as follows: "Don't be so simple as to fancy that there is any mystery as to the identity of 'Cosmos.'" Everybody knows it's *you*, Mr.————! Your style betrays you in every line, and, try how you may, you never can or will disguise it. So take my advice, and drop the fiction of living so far away from London and all that sort of thing!" Another letter asks me to give the writer my real name in order to settle a bet. Finally, perhaps, to me, the most interesting of all these effusions is one written by a *soi-disant* photographic journalist to the editor of a photographic paper, stating that the writer was "Cosmos," and offering to contribute similar matter over another *nom-de-plume!* On the whole, I have been much amused at the various letters that have been forwarded to me, and, thinking that my readers would also derive a little enjoyment by a brief peep behind the scenes, I have ventured to make the foregoing extracts for their edification. If I were asked to say what I think the moral of all this is, I should probably be charged with conceit, and so, as a simple holiday task, dear reader, I will leave you to guess it for yourself.

One frequently hears it said, and sometimes sees it written, that modern photography has reached such a pitch of excellence that little remains to be discovered or perfected. Certainly at first sight, and bearing in mind the remarkable advances in the chemistry, optics, mechanics, and manufactures of photography that have taken place in comparatively recent times, it seems hard to imagine in which direction we are to look for improvement. Nevertheless, when one comes to closely examine into the conditions under which photography is carried on, it is astonishing how great is the area of virgin ground which still awaits the plough of the experimentalist. Take, as an example, colour photography. Admitting the genuineness of Lippmann's and Lumière's results (which I, like many others, have to take on trust, as I have not seen them), have we advanced beyond the threshold of the realisation of the dream? Years and years of assiduous experiment will probably have to pass before photographs in nature's colours are made really practicable. Then, should we not all welcome an innocuous substitute for hypo as a Heaven-sent blessing? Should we not be glad of a method for standardising the speed of sensitive plates? Would not orthochromatic photography be much more practised and understood than it is if we discovered a dye which, while sensitising an emulsion for the green-red rays, reduced the photographic activity of the violet end of the spectrum to commensurate limits, and thus obviated the use of a screen? And so on. Finality, in short, is still a long way off in many branches of photography.

I spoke just now of orthochromatic photography. With what has been done in this direction during the last eleven years I thought I was tolerably familiar; I have also had a great deal of practica acquaintance with the working of colour-corrected plates. The advantage claimed and possessed by commercial orthochromatic plates o ver ordinary plates is that, in contradistinction to the latter, they are sensitised for the green-yellow rays and are possibly amenable in a slight degree to the orange. In most cases the use of a yellow screen is essential to obtain, with orthochromatic plates, the best translation of the relative luminosities of the original. This I imag ined correctly stated the two leading principles of orthochromatism, until reading the report of the Hackney Society's meeting. on June 12 (see p. 398). At that meeting Mr. Avent appeared to, thi nk that a yellow screen was of advantage with ordinary plates, saying that a better rendering could be obtained with a deep orange scr een t han without. I have made many experiments in this direction Wi th light and deep-tinted yellow screens I never succeeded in ge tting the slightest improvement in orthochromatic effect. Orange scr eens I have not tried, but theoretically they would increase the expo sure so enormously that one could rarely afford to give the time for practical purposes, and, if the plate were not sensitive to the less refr angible rays, I cannot see where the advantage would come in. Mr. Beckett, who at the same meeting concurred in Mr. Avent's views, is alleged to have said that "*as dry plates of the ordinary kind were sensitive to all rays of the spectrum* (italics mine) . . . if the blue and violet were cut off, the other rays would act if only allowed sufficient time." I take leave to doubt the correctness of the statement that in the accepted meaning of the term, dry plates of the ordinary kind *are* sensitive to all rays (including the red). Were it otherwise, why should two makers specially sensitise plates for the green-yellow rays. and why have Messieurs Lumière just placed on the market a plate rendered sensitive to the red?

Orthochromatic plates are undoubtedly becoming more and m ore popular, especially for landscape work and reproductions of c oloured objects, but it is to be regretted that, so far, the process a ppears to have found comparatively little favour with professional photographers for studio portrait work. That, for this purpose, orthochromatic plates are not so much used as they might be will be ev ident to any one from a study of photographers' specimens. I s uppose the fault of this rests not so much with photographers the mselves as with their sitters. The general public still remains ignorant of the principles of orthochromatism and the advantages of their a pplication, and this is how it is that, for example, a fair-haire d lady is content year after year with photographs in which her hair is represented as relatively much darker than it really is. All the same, it seems to me that it would be well and advantageous if photographers would endeavour to point out to their sitters wherein the practical gain and value of orthochromatic photography lies. Good results, in a financial sense, would surely follow. But, as I have before remarked, professional men seem insanely loth to profit by t he opportunities of improving their business which photographic progress places in their hands.

As a slight contribution to the interesting correspondence now proceeding with regard to the question of combined *versus* separate toni ng and fi xing baths, I may recall the fact that, in the very early days of albumen printing, the combined toning and fixing bath was tried for a long time, and was finally abandoned owing to the fugitive nature of the results that it yielded. The gold chloride was added to the hypo bath, and visually beautiful tones were obtained, but it was found that the toning action was not a simple precipitation of gold on the print, but a deposit of gold and sulphur. The addition of gold to hypo forms, among other compounds, tetrathionate of soda, which has the effect of liberating sulphur. The older the bath the more sulphur is liberated, until finally toning would be totally by sulphuration. Of course this could have been obviated by either neutralising the gold solution or rendering it alkaline, but I am speaking of pre-alkaline gold-toning days. A study of many modern combined toning and fixing formulæ convinces me that probably the gold is often added to the hypo in an acid state, in which case we get a repetition of the conditions favourable to partial sulphur toning. If the permanence of our prints

depends upon the quantity of the gold deposited upon them, then the sooner combined baths, or any other system of gold toning open to suspicion as to its behaviour in depositing the noble metal, are abandoned, the better. I, for one have never been able to discover the advantages of the combined bath in practice; theoretically it is full of uncertainty. COSMOS.

PHOTOGRAPHY IN COLOURS.*

WE now come to the question of the printing inks; obviously these cannot be chosen at random—they must be selected with as much care as the negatives. They must answer to certain spectroscopic requirements; the red ink must absorb two-thirds of the spectrum, and reflect one-third the yellow ink the same, and the blue ink the same. In the appendix I shall give the different inks recommended by various writers. The inks must be permanent in light, and, when printed one over the other in full tones, must give black—in half-tones, grey.

There is one other method of printing, which is another of Mr. Ives's suggestions, and that is, to produce three Woodburytype prints in the proper colours, and superimpose them. This undoubtedly is, except for its cost, the finest method of producing three-colour prints, because Woodburytype is the only process which has absolutely true half-tones, and any number of prints can be prepared without variation. The red negative is again printed in blue, the yellow in red, and the blue in yellow.

Vogel has stated that the printing ink must be spectroscopically identical with the colour sensitisers used in making the negatives; this is false, as pointed out by Mr. Ives, for, supposing we use cyanine and erythrosine for one set of negatives, and cæruleine and rose Bengal for another set, we probably should get absolutely identical negatives, yet the printing inks would be totally different. If, on the other hand, we use the complimentary colours to the screens, we get in a worse mess than ever. Heuza suggests cadmium yellow, purpurine lake, and milori blue; others, cadmium, carmine, and ultramarine. Vidal gives chrome yellow, carmine, and ultramarine. Weissenberger uses a rather dull yellow, which you can see for yourselves.

I need not, of course, point out to practical workers that it is possible to place the lineæture or grain screen in front of the plate on which the original negative is made, and I think this has some advantages.

Within the last few months, Mr. Gray, an optician of New York, claims to have made distinct advances over Ives, and Mr. Ives states that he actually taught Gray, and made his screens for him, and the essential difference in Gray's optical projection is, that he uses a fourth positive to correct faults.

Having thus briefly run through the process generally, I think it may not be out of place to glance at the possibility of perfectly reproducing nature by three-colour printing, and I cannot do better than quote from a very valuable paper by Hübl on this subject:—

"An absolutely faithful reproduction of an original can never be obtained by mixing three pigment colours. It is generally known, for instance, that certain shades of green—for instance, mitis green—cannot be mixed from blue and yellow, and these colours, when they are specially suitable for mixing to make green, give a bad orange and violet.

"The fixed absorption bands of the printing inks cannot be so closely matched to the absorption curves of the colours to be reproduced in order to obtain tints true to the original. Moreover, three colours combined in seven tones give over three hundred different shades of colour; but, independently of that, the whole group of colours fail in the mixing; the mixtures of the colours, which are actually possible, only fall in the right places if the printing process is correctly chosen and the negatives absolutely correspond. Both, at present, are unattainable.

"The film of colour which is laid on is more transparent the thinner it is; it acts, therefore, in the deep or saturated tones differently to what it does in the delicate half-tones. If, for instance, a scale of seven tones is printed in yellow, red, and blue, one over the other, the darkest shades appear blue, the middle shades grey, and the brightest brown. The blue, which is the top film, prints too strongly in the deep tones, and cannot neutralise the orange substratum in the delicate half-tones.

"The absolutely necessary equality of the pulls in the preparation of an edition presents, however, the greatest difficulties. Each irregularity influences, in a manner which one can scarcely believe, the character of the whole print. If each individual print is not absolutely identical in colour and intensity, an edition is obtained which can hardly be used. In this respect the collotype steam press is superior to the hand press, and the ordinary type press ought to give relatively the best results."

As a *résumé* of the above observations, we come to the following conclusions:—

1. The photographic three-colour printing will be further improved by the introduction of new sensitisers (I may interpolate here that the sensitiser we want is one for blue-green rays) and printing inks, and at present assistance must be obtained from retouching (or masking out), which specially applies to the negatives for the red-printing plate.

2. The process will never give absolutely true reproductions.

* Continued from page 443.

3. The three-colour print proves, as a photographic reproduction, the truth of the drawing. The hand of the artist is required from the incomplete reproduction of the colours.

4. The photographic three-colour printing is especially suitable for the preparation of coloured illustrations in large quantities; less suitable, however, for the preparation of art studies of well-known paintings.

Ladies and gentlemen, the subject we have been considering is a very wide one; there are openings for plenty of experimenters in every department, and I hope some may be induced to take the subject up. Personally, I mean to work at it still further, but there are difficulties which any one working privately has to contend with. We have in this country no institute devoted to photography, whereas in Vienna and Berlin, for a small fee, you can go and utilise costly apparatus and appliances. A private experimenter has to utilise his own time and his own money, and this stands largely in the way of more serious work in photography.

I have glanced hitherto at pure processes of three-colour printing; there are other processes which depend partly on photography and partly on hand work.

The first of these, which I think has given the very finest results, is chromo-collotype, as practised by Weissenberger, of St. Petersburg. Weissenberger uses retouching for the red negative, or masking, or painting out. I have some of Weissenberger's results, and very fine they are; but let us for one moment consider this retouching, or masking out. We will take, for instance, this specimen, and, taking any colour obtained by mixing red and blue, for instance, how is it possible to know exactly how much stopping out or retouching to lay on the negative to give the exact and true balance of colours? Whilst, with Hübl, I admit that hand-work may be necessary, I fail to see anything but very great difficulties in its use.

An English firm, Messrs. Hare & Co., are also printing in colours, utilising four litho prints and one block; this is purely stopped-out work.

Boussod, Valadon, late Goupil, as you are probably aware, publish photogravures in colour; these, however, are solely produced by hand-work—that is, the colours are laid on one plate by hand by an artist, and selective negatives are not used for making the plates.

Hösch, an artist of Munich, has proposed a process which is extremely complicated, and practically consists in copying the object, making five prints from the negative, working up the prints with a scale of monochromatic colour, copying such print, and then making five collotype plates, and printing in red, yellow, and blue, in grey for the half-tones, and deep grey for the shadows.

Orell and Füssli, of Zurich, and the Photo-chrome Company of the same town, turn out some very fine coloured work, which is, however, produced by lithography, and as it depends, at least in the case of Orell and Füssli, on artists' hand-work, I shall content myself with giving the description of the working of this process, so far as it is known in the addenda. E. J. WALL.

Notes on Screens used in Three-colour Photographic Process. By F. Bligh Bond.—The screens I have found best fitted for this work are dry screens, prepared as follows:—

I take two squares of thin polished plate glass, coat them both with a clear solution of finest gelatine, from which all suspended matter has been precipitated, and dye the films thus formed with such dyes as may be desirable. By using two films to each screen, I am enabled more precisely and certainly to obtain the requisite depth of colour, and imperviousness to other rays of light as, *e.g.*, in the red screen, I dye one film to a rose red, the other to a deep orange yellow, and in combination these give a more perfect primary red than I should otherwise obtain. When the two films are quite dry, I unite them face to face with Canada balsam, and bind the edges (as a lantern slide). The three screens represent filters for light of the three primary colours, or agreeing with the three pure colour sensations, but the blue screen is tempered, on account of the relatively high sensitiveness of the ordinary photographic plate, to rays of a secondary blue (blue two, green one), which are highly undesirable, and I therefore have always given it a distinctly violet cast, or even violet-red, and have always found it work well, and with sufficient rapidity. In this connexion I must explain that it has always been my practice to use nothing but ordinary plates with the blue screen, it having been my consistent endeavour to simplify, in every possible way, the working of the three-colour process, so that it might be practised by amateurs extensively.

I have therefore employed Ilford and other similar plates of known speed for the blue exposure, Edwards's isochromatic plates for the green, and ordinary commercial plates sensitised with cyanine for the red.

Any difficulty or failure I have experienced is attributable, in my opinion, to this latter sensitiser. It is indeed a most difficult and unreliable agent to employ, but that its nature and tricks will eventually be completely mastered I have no doubt. It appears to me that the most vital necessity is to have means of drying any plate thus sensitised thoroughly, and above all *quickly*, in a pure atmosphere. Any delay causes inequality and partial insensitiveness. The method of sensitising most to be recommended is undoubtedly that propounded by Mr. F. E. Ives, *i.e.*, by means of a solution of cyanine in absolute alcohol—and an immersion of the plate in water at some subsequent period (followed by drying) before use.

MAKING MIRRORS FOR PHOTOGRAPHIC PURPOSES.

At the last ordinary meeting of the South London Photographic Society, held at Hanover Hall, Hanover-park, Peckham, Mr. B. Lyon in the chair, a demonstration of *Making Mirrors for Photographic Purposes* was given by Mr. J. Miller. The glass for making mirrors must have its surface optically worked. The following solutions are required, viz.:—

(*a*) Eighty grains of nitrate of silver dissolved in two ounces distilled water;

(*b*) Eighty grains of pure caustic potash dissolved in two ounces distilled water.

Ammonia solution is added to *a*, drop by drop, continually stirring, until the whole of the silver is deposited and redissolved. When all the silver has been redissolved, the solution becomes clear. The potash solution, *b*, is then added, when the solution again becomes black. More ammonia solution is added drop by drop, stirring as before. The slower the ammonia is added, the finer the division of the silver is. When the solution again becomes clear, the action is complete. A weak solution of nitrate of silver is then added, drop by drop, until a *very* pale brown colour is attained. Errors may be corrected by adding more silver or ammonia as may be necessary. The silver should be slightly in excess in the final solution. This solution should not be kept, as it becomes a powerful explosive. Filtering is not recommended. Two and three-quarter ounces of the solution are taken, and water added to make it up to eight ounces. The glass for the mirror having been made chemically clear with nitric acid, and washed in distilled water, is placed in a bath face downwards, but supported, to prevent the face touching the bottom of the bath. It is then covered with the solution for a few minutes. Half an ounce of reducing solution (10 per cent. solution of sugar of milk or grape sugar) is then taken, and the solution from the bath poured into it. It is then poured back carefully over the mirror, avoiding the formation of air-bubbles when the deposition of silver begins to take place, and the solution becomes muddy. The slower the action takes place the harder the deposit. Leave until all the silver has been deposited, then pour off the solution, wash with distilled water several times. Dry carefully to avoid markings, and polish the face of the mirror with rouge when it is completed, and may be kept for use wrapped in velvet. Two mirrors were successfully made by the demonstrator.

ON THE MOUNTING OF LARGE TELESCOPES.

[Knowledge.]

Every one interested in the mounting of large telescopes will see in Sir Howard Grubb's paper, in your May number, a most valuable contribution to the literature of the subject. It seems likely that we are soon to be brought face to face with the problem of devising suitable mountings for instruments of great aperture, and the novel modification of Dr. Common's flotation method, described in the article referred to, contains features which commend it at once. At the same time it is not without disadvantages, but whether or not these are to be regarded as serious experiment can best decide.

It is hardly to be doubted that Sir Howard is right in looking to the reflector as the most promising means of furnishing greatly increased light-grasping power. Such able opticians as Brashear and Clark have told me that they are ready to make objectives of as great aperture as the optical glass furnished them will allow, and during a recent visit to Jena I found Dr. Schott confident that he could soon make discs of hitherto impossible size. Nevertheless, an aperture of sixty inches is the largest I have ever heard of discussed for an objective, while Dr. Common has at least two mirrors of this size, not to mention Lord Rosse's great instrument. In default of glass, speculum metal could be used, and I feel certain that Brashear would undertake a mirror of ten feet aperture.

It is apparently only too true that for many classes of work the reflector is inferior to a refractor of the same or even much smaller aperture, but we may at present consider only such problems as require for their solution an instrument of great light-grasping power. I quite agree with Sir Howard that "the chief hope of progress in astronomical research lies undoubtedly in the application of photography," and the great telescope under consideration should most certainly be capable of being used for this purpose. But the possibility of photographing a field of stars or nebulæ at the focus of the instrument, while most eminently desirable, is not the only advantageous use to which a large instrument could be put. Indeed, I venture to believe that the employment of such a large telescope for the photography of stellar spectra would be of even greater value in the advancement of science than the results to be obtained by ordinary photographing in the principal focus; for so fruitful is the study of the spectra of the brighter stars with small telescopes, that a far more abundant harvest may be expected when greatly increased apertures bring the countless number of fainter stars within reach. In the case of the brighter stars, the manifold increase of dispersion made possible by the gain in light would render still more accurate than at present the measure of motions in the line of sight, and the spectroscopic method would become a hopeful means for the determination of the solar parallax. But the importance of stellar spectroscopy is too evident to require discussion, and I will merely point out one practical reason for designing the telescope with this end in view. If the definition of the instrument from any cause should turn out to be defective, unsuiting it for direct visual or photographic work, it might still be of great service in spectroscopy, especially with a spectroscope having a long collimator. Thus, if the telescope be of a design suitable for spectroscopic work, its construction need hardly be looked upon as an experiment, for the probability that it would not suffice for this purpose is very small.

If the desirability of constructing the telescope for spectroscopic work be admitted, the focal length must certainly be much longer than that chosen by Sir Howard Grubb. With a spectroscope of given aperture, the brightness of a star's spectrum is independent of the focal length of the large telescope. If we choose a collimator of about twenty-four inches focus, and give it an aperture of two inches (more than this would hardly be advisable, on account of the great size and weight of the prism train), we have a trio of one-twelfth. With an aperture of ten feet the great reflector would thus have a focal length of one hundred and twenty feet. In any case I hardly think a ratio greater than one-tenth would be advisable from a spectroscopic standpoint. Sir Howard has chosen a ratio of about one-fifth, giving a focal length of fifty feet for an aperture of ten feet. Doubling the length of the tube would certainly render the problem of mounting the instrument much more difficult, but this very increase emphasises the necessity of employing some such method of supporting the tube as that devised by Sir Howard Grubb.

One of the greatest defects of all forms of telescope-mounting at present employed is the method of supporting the tube at a single point, which is usually near the centre. In small instruments the difficulty is not felt, but, as the focal length and weight of the objective increase, the question becomes serious. In the case of the forty-inch Yerkes telescope the objective will weigh about five hundred pounds, and the solar spectroscope nearly half a ton. These weights (with additional counterpoise at the objective end) will be carried at the opposite ends of a steel tube sixty-four feet long, supported at the centre by the great declination axis. Messrs. Warner and Swasey have done their work so well that we fear no serious flexure, but a certain small amount must be expected. If the aperture were trebled and the focal length doubled, a single support would hardly be sufficient.

With a reflector the conditions of the problem are quite different, as the mirror comes at the lower end of the tube. I have queried whether a slight modification of Dr. Common's mounting for his five-foot reflector would suffice for double the aperture and a much greater increase in focal length. As the mounting is constructed, the polar axis is a great cylindrical steel vessel, so weighted as to float at the proper inclination in a tank of water. The declination axis is near the lower end of the short telescope tube, which is supported by it within a fork projecting from the upper end of the polar axis. As the tube is very short and light, the mounting is a very suitable one. If the fork were closed into such a form as that shown in the drawing of Sir Howard Grubb's model, and the upper end of the polar axis perhaps floated in a second tank, a long tube supported near its middle point might be carried fairly well, the range in declination being about the same as in the case of the instrument described in *Knowledge*. But, as compared with the latter, this telescope would have, in common with most other instruments, a number of serious disadvantages.

In the first place, the tube would be so supported as to show a marked effect of flexure due to its own weight. In Sir Howard Grubb's instrument the flexure of the lower portion of the tube would be very small, and that of the portion of the tube above the declination axis would also be small on account of its comparatively short length. There would, however, be a flexure produced by the resistance of the water to the motion of the tube when driven by the clock. It would be an important advantage if the driving power could be applied directly to the lower end of the tube, but on account of the motion in declination this is probably impracticable.

Again, the motion of the eye-end would be very great. In the case of a great refractor like the Yerkes telescope, the floor (seventy-five feet in diameter) of the observing room must be arranged to rise and fall through a distance of twenty-two feet. This seems unavoidable with a refractor, but Sir Howard's plan reduces the motion of the eye-end of an eight-foot reflector to so small a quantity as to make it always accessible by very simple and inexpensive means. For a ten-foot reflector of one hundred and twenty feet focal length the motion of the eye-end would necessarily be greater, but there would probably be no great difficulty in following it

on a movable stage with stairway, or the observer might readily be carried on the telescope tube itself. But, bearing in mind the purposes for which the instrument is designed—photography and stellar spectroscopy—this difficulty could easily be avoided. I would mount the spectroscope on the end of the tube, with the slit at the focus of the great mirror and the axis of the collimator coincident with the axis of the reflector.

The slit jaws should be polished, and inclined so as to make a small angle with the focal plane. A reflecting prism and telescope, supported near the centre of motion of the reflector, would enable the observer to keep a star on the slit. This device, which has been used by Dr. Huggins for years, is much superior to any other method of maintaining a star on the slit. For the second important use of the reflector the spectroscope slit could be pushed up out of the focal plane, to give place to a carrier for photographic plates. A small mirror, attached to the outer edge of the carrier, and adjustable in position, would make possible the observation of a star outside the field being photographed, with the small telescope used for a similar purpose with the spectroscope. Thus, in both cases, the observer could stand near the centre of motion, and keep a star on the slit or cross hairs for hours. It would be necessary to reach the upper part of the tube only for the purpose of inserting the plate-carrier, and for visual observations.

Another difficulty of ordinary mountings is the necessity of providing a very large and expensive dome to cover them. The dome fulfils a double purpose; it protects the instrument against the weather, and shields it from the wind during observation. The second point is perhaps of more importance than the first, for a large telescope might be so constructed as to suffer little from the weather, its more delicate parts being covered. As for the wind, a wall like that shown in Sir Howard Grubb's drawings would sufficiently protect an instrument three-fourths of which is under water. If a dome were desired, a comparatively small one would suffice. The great saving of expense on the dome and rising floor is an important argument in favour of this form of mounting.

Of the possible disadvantages which Sir Howard Grubb has enumerated and discussed, it seems to me that the first is the only one to be regarded as at all serious. Considering its size and the immense number of interesting objects within its reach, the limited range of the reflector is no very great objection. The friction of the liquid would probably render the setting rather slow, but such a telescope is not designed to swing quickly about from one object to another. It could better be employed a whole night on one or two fields. As to the currents created in setting the instrument, they would certainly be of brief duration, and may therefore be disregarded. But the difficulty arising from the difference in temperature between the liquid and the air is a more troublesome matter. That the definition would be affected, and, worse still, the mirror dewed if the air were warmer than the liquid, must be expected. The remedies proposed might serve to remove these difficulties, but I am somewhat sceptical about the advisability of warming a mirror at the back. It might be well to employ a double system of pipes for heating and cooling, so controlled by a thermostat as to keep the liquid very nearly at the temperature of the outside air. I should still retain the proposed double tube, with the constant circulation of air; but, even if every such precaution were taken, much trouble from dewing of the mirror might still be feared. Heating the mirror at the back, *if it could be managed so as not to interfere with the definition*, would probably be the most effectual remedy for dewing. It is hardly necessary to add that, in our northern latitudes, some liquid of lower freezing point than water would have to be employed.

PROFESSOR G. E. HALE.

PLATINOTYPE PRINTING BY THE NEW COLD BATH PROCESS.

IT is a general feeling with the beginner that this process consists of innumerable difficulties, says Mr. S. L. Coulthurst, in the *Photographic Record*, whereas, in fact, it is about the most simple, safe, and artistic permanent printing process that I know of. Why the beginner should choose a silver process to begin his career of difficulties in the photographic world I do not know, for I think that any printing process that dispenses with the operation of gold toning (which is always more or less a stumbling-block with the beginner), and does not necessitate some other more complex treatment, cannot be considered more difficult. I will try and demonstrate with the few prints which I have already exposed and are now ready for development. These prints have been made during the last two or three days, which has not been the best of weather for platinotype printing

In dealing with the process, I shall give it in plain, every-day fashion, without any of the many dodges that can be used, and which I never practise, having no time for experimental work.

In the first place, good, clear, plucky negatives give the best results, yet prints can be got from almost any kind of negatives if care is used. Negatives that are "ghosts" are of no use for this process, you must use P.O.P. or other silver paper for them. When the paper is received from the maker, you will find it in a sealed tin. Transfer it from this into a calcium tube, which is made of tin, opening at each end. One end has a kind of grating fitted so as to hold a supply of calcium chloride, which is to keep the paper dry, for this is a most important point. The paper must be kept dry before, during, and after exposure. If the paper is in the least damp you are most liable to over-expose it, for the image sinks into the paper, as it were, and gives you a deceptive image on the surface. It is always best to print in good dry weather, of which we do not get much in Manchester. Take a good average negative, place it in the printing frame, and, after putting in the platinotype paper, place at the back a piece of mackintosh cloth or indiarubber sheeting to keep it from the damp during printing, which is done in the same manner as silver paper.

We now arrive at what is, perhaps, the most difficult portion of the process, and in which the beginner will first fail. How far shall we print our picture? This can be soon learned by the expenditure of, say, three pieces of paper as follows:—Set three frames going; print one light, one until the portions of the image which are under clear glass shall be a good orange, and a third until the image beneath clear portions are of a good light brown. Take these and cut them in two, stow away one-half of each, and develop the remaining halves, and you will now see which is the correct or nearest approach to perfection. Compare them with the undeveloped strips, and make a mental note of the fact as to the right depth to print, and you will soon have no difficulty in turning out prints all of one colour and beauty. The speed of the paper is, perhaps, one-third quicker than the ordinary silver paper, so care must be used in not exposing it unduly to strong light, otherwise degraded whites will be the result.

We are now ready for developing, and make a stock solution of the special developing salt, sold by the Platinotype Company at 1*s.* 4*d.* per pound, as follows:—

Salts	2 ounces.
Water	25 ,,

Place as much of this as will fill your developing dish to the extent of about half or one inch. (The dish should be used for no other purpose.) Now take your piece of paper thus—by its two corners, and bend it slightly face down, at the same time bringing it with one sweep upon the developer, turn it over quickly, and watch your picture until it is intense enough, which will be in about thirty seconds. Take it out at once, and place it in an acid bath of

Hydrochloric acid	¼ ounce.
Water	12 ounces.

Shake up well before using. The prints should be passed through acid baths until all trace of yellowness is gone, after which they only require washing in several changes of water before being put to dry.

You will find this a cheap developer. When you have finished your batch of prints, do not throw the developer away, but place it in a fresh bottle for future use, adding from your stock bottle to keep up to its original bulk. If at any time there appears a kind of sediment at the bottom of the bottle, it is of no consequence; simply drain off the clear for use, throw the other away, and then make up your bath to its original bulk from the stock bottle. Always use a fresh acid bath for each lot of prints; it is cheap enough, and will ensure your prints always being clean, clear, and permanent. I do not think I can add anything more about such a simple process to those beginners for whom I have intended it.

Our Editorial Table.

PORTRAIT OF THE LATE GEORGE WHARTON SIMPSON.

MR. VALENTINE BLANCHARD has kindly sent us a portrait of the late George Wharton Simpson, which we shall highly treasure as an admirable presentment of our late *confrère* in the world of photographic journalism. Of this portrait Mr. Blanchard writes: "When I met —— at Bristol I was telling him of my portraits done with a single lens (the front of an old French half-plate lens), and Dallmeyer's astonishment at the result, for there was no stop whatever used. Dallmeyer said, when he saw the instrument, that the long tube used by the French practically became a stop. Shortly afterwards he brought out a lens to bring about the result I had secured with my Frenchman—a lens specially made to produce as much diffusion of focus as might be required. This was the first of the patent lenses (5D), and my old friend, Simpson, was the sitter during the experiment. The other day I came upon some old prints of this experiment, and, as it is a strong portrait, I thought you might like to have a copy."

Tourist Guides.

From Sir Joseph Causton & Sons, Southwark-street, S.E., we have received *Mountain, Moor and Loch*, a guide to the route of the newly opened West Highland Railway. The natural charms of the country are sympathetically described, and the book abounds in numerous illustrations from pen and pencil sketches specially made.

Great Eastern Railway Company's Tourist Guide to the Continent.

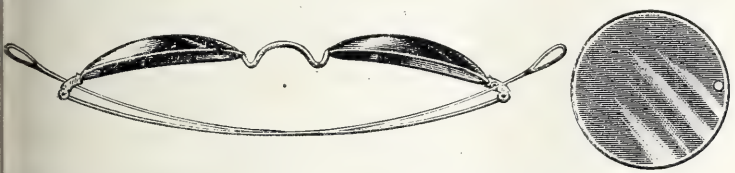
Edited by Percy Lindley: 30, Fleet Street.

In this handy little guide will be found brief illustrated descriptions of places of popular resort served by the enterprising Great Eastern Company in Holland, Belgium, Switzerland, and Germany.

Phototone Spectacles and Eyeglasses.

By R. & J. Beck, 68, Cornhill, E.C.

We are very glad to find that Messrs. Beck have recognised a real want in photographic practice, that of spectacles or eyeglasses which, when applied to the eyes when viewing scenes in nature, shall show them as they are likely to appear in photographs of the same. By the use of such "helps" to see, much of the glamour of colour which deceives the photographer's judgment will be dissipated, and a far truer judgment arrived at. Messrs. Beck have chosen a glass having special excellence in monochromatising bright non-actinic colours, this being of a special bluish green colour. We give drawings of the glass herewith, as mounted in spectacles and in single eyeglass



fashion. In an accompanying circular, Messrs. Beck say: "It is a well-known fact that, without the aid of orthochromatic plates, stained screens and long-exposure, photographs cannot render the correct light and shade values of nature. Objects which appear to the eye to be the most brilliant points of a view often do not turn out to be so in the photograph. This is due to the fact that the colours which are visually the most brilliant are not the most active on the photographic plate, yellow and red appearing too dark, violet and blue too light. A brilliant poppy will be less conspicuous in a photograph than a deep blue iris. The phototone spectacles which we are now introducing are made of special coloured glass, the use of which translates the views into a monochrome, producing the same light and shade appearance which will be obtained in the photographic picture. Hence the choice and arrangement of one's view can be more satisfactorily accomplished by their means, and we do not doubt that amateur photographers will be glad to take advantage of this additional aid to artistic work. Every experienced photographer will recall his disappointment at the comparatively flat and uninteresting photograph sometimes obtained of a view which appeared so full of interest on the ground glass of his camera. At times a red tiled house-top may form a bright contrast to the surrounding foliage, but in its photographic representation this contrast is lost on account of the above-mentioned fact, that without special appliances the red will be rendered as dark or even darker than the green trees." We are glad to find that such a useful appliance is now accessible to all.

Group Enlargement.

By Morgan & Kidd.

The group in question, we need scarcely hint, is that of the Dublin Convention, and it speaks much for the enlarging capabilities of the firm that it is quite as sharp and much fuller in detail than the one from the same negative already published. Its dimensions are 23×17. The tone is an engraving black, and it is nicely mounted on an India tint.

We have received from Messrs. G. W. Wilson & Co. catalogues of a series of wild animal photographs they are publishing from negatives taken by Major J. F. Nott, which to judge from illustrative engravings, are posed in a natural manner. Another catalogue embraces views of scenery in various countries, Scotland, Spain, Gibraltar, and Morocco.

Messrs. Archer & Sons, of Lord Street, Liverpool, have sent us their supplementary list of new cameras and photographic apparatus. This contains particulars of many good and new things in hand-cameras, &c.

News and Notes.

The Eighteenth Annual "Stanley Show" will be held this year from November 23 to December 1. The Photographic Section, consisting of apparatus and accessories and competitive pictures in various classes, for gold, silver, and bronze medals, will be included for the third year. Prospectuses and full details will shortly be ready.

Mr. Alfred Price, of 26, King-street, Great Yarmouth, writes: "A Dallmeyer's rectilinear lens, rigid setting, has disappeared from my studio. It was taken without flange or stops. Should same be offered for sale to any of your readers, I should be thankful for information, so that I may have opportunity of regaining it. The lens is an old one, and had a green-covered cap."

Photo-mechanical Exhibition of the Royal Cornwall Polytechnic.—At the moment it is impossible to forecast the extent and success of the Show, for though some of those who at first supported it warmly now hesitate as to whether they will show or not, others who at first were doubtful now promise good displays. A few foreign and American exhibitors will be well represented, and in respect of variety of work, both in black and colours, promise to leave the home exhibitors far behind. In quality (in the half-tone work at any rate) they will run the Britons very close. Good competitive exhibits are promised in collotype, photo-lithography, half-tone, and photogravure (both in monotint and in several colours). The educational and historical section will probably be a prominent and useful feature, and it will be transferred bodily to the Royal Aquarium Exhibition.

Zinc *versus* Copper for Half-tones.—In *Process Work* for June—July Mr. Max Levy has some remarks concerning expediency and relative quality as between the two metals. He says: "The writer has made frequent careful tests, under varying conditions, with a view to obtaining light on this aspect of the question at issue, and his conclusion has invariably been that, so far as actual result in the proof is concerned, there is little or no choice between the two metals. The two illustrations herewith show better than words this relation, and it must be explained, in addition to the notes on the plates, that the negative was made 'open,' as it would be for a plate destined to have the high lights re-etched locally. As a finished result, at the stage at which these plates were printed, the zinc is rather the better; the high lights are brighter, owing to the greater tendency of the zinc to 'undercut' in the acid bath than of the copper in the perchloride. The copper has 'held its colour' somewhat better; but, with a very little judicious re-etching, both plates could easily be made to yield exactly the same print. In tests of this kind a great deal depends on the selection of suitable samples of metal, but we are convinced that careful handling and a fixed and definite aim will lead to identical results on either metal. The natural characteristics of the metals and etching baths would naturally lead to slightly different treatment and negative, if identical results are to be obtained. The point of relative durability will depend largely on the kind of zinc used, and if this is of the hard quality mined in the Western United States there will be little choice in this particular. It is true the zinc oxydises more readily, and when zinc plates are washed with lye they are frequently ruined. The enamel process aids the zinc in this particular: where the enamel is left on the surface, it protects *at least* the printing surface, and this is a great deal. Finally, the zinc plate can be coated with a thin film of copper by immersion in a warm bath of cyanide of copper, and if a mild electric current (about one volt) is applied, with the addition of a copper anode in the circuit, a durable and respectable covering is obtained. This process, it is true, involves some trouble, but it affords an excellent protection to the zinc where this is needed, and the trouble is not much in comparison with the expense and other difficulties encountered in the use of copper. Finally, all things considered, and without regard to questions of commercial expediency, we should probably prefer a plate of copper to one of zinc, if for no other reason than that the former is a nobler metal, and a plate of that metal has a certain 'genuineness' that a zinc plate will never have.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,676.—"Improvements in making Negatives in Relief, or Sheets of Raised Type on Tin Foil or Thin Metallic Sheets, and in the Apparatus for Printing Copies from such Negatives." Complete specification. W. Cordeaux.—*Dated July*, 1894.

No. 13,798.—"A New or Improved Method and Apparatus for the Preservation of Water-colour Drawings, Photographs, Engravings, and the like. A. H. Church and W. S. Simpson.—*Dated July*, 1894.

No. 13,899.—An Improved Magazine for Photographic Dry Plates or Negatives." J. B. Brooks.—*Dated July*, 1894.

No. 13,953.—"A New Artistic Photographic Frame." A. P. Barnett.—*Dated July*, 1894.

No. 14,041.—"An Improved Storage Box for Photographic Negatives. J. B. Brooks.—*Dated July*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
30	North Middlesex	Discussion on Mr. Avery's Architectural Paper.
31	Birmingham Photo. Society	
31	Brixton and Clapham	*Photogravure.* Mr. Denison.
31	Hackney	*Economical Photography.* F. W. Gosling
31	Halifax Camera Club	
31	Lancaster	
31	Leith	
31	Paisley	
31	Rochester	
31	Warrington	
31	West London	
August.		
1	Leytonstone	
1	Manchester Amateur	Excursion: Sherwood Forest. Leader, E. Ashman.
1	Photographic Club	
1	Southport	
1	Southsea	
2	Ashton-under-Lyne	Meeting to Compare Results of Rambles to Miller's Dale and Hope.
2	Birmingham Photo. Society	
2	Glossop Dale	
2	Hull	
2	London and Provincial	Lantern Night.
2	Oldham	
2	Tunbridge Wells	
3	Brighton and Sussex	
3	Cardiff	
3	Croydon Microscopical	
3	Holborn	
3	Leamington	
3	Maidstone	
3	North Kent	
4	Ashton-under-Lyne	Excursion: Chapel-en-le-Frith. Leader, Walter Leigh.
4	Hull	
4–6	Liverpool Amateur	Exc.: Ludlow. Leader, W. Tomkinson.
4	Oldham	Excursion: Davenport for Bramhall Hall. Leader, B. J. Holt.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

JULY 24,—Technical Meeting, Mr. H. Snowden Ward in the chair.

The HON. SECRETARY showed samples of the new "Otto" printing-out paper by Mr. O. Scholzig, and read a few notes on the working of the paper. The Hon. Secretary also showed Watkins's "Eikronometer."

DEVELOPMENT OF PRINTING-OUT PAPERS.

Mr. W. J. WILSON showed several specimen prints on gelatino-chloride paper developed by the method described at the previous meeting. He also exposed a gelatino-chloride opal behind a negative to magnesium wire (six inches), subsequently bromising, developing it, &c.

In reply to a question of Mr. E. Clifton, Mr. WILSON said he thought it might be possible to enlarge by this method on a very bright day.

Mr. T. BOLAS suggested the use of the heliostat for the purpose.

The CHAIRMAN said that a photographer in the United States still had fourteen or sixteen heliostats in use.

In reply to another question, Mr. WILSON said that the shortest exposure he had ever tried was about five seconds; but he thought it possible to do even with two seconds. Paper that printed out quicker would not make any great difference in the exposure. Answering Mr. Bolas, he said he did not think the bromide acted in the same way as a solution of bromide would for remedying over-exposure.

Some discussion as to the action of bromide on the latent image took place, Mr. ANDREW PRINGLE stating that its effect was not to destroy the latent image, but only to retard development.

Answering a question, Mr. WILSON said, the more sulphite and hydroquinone in the developer, the softer the result. He did not think the exposure affected the result in this matter. Speaking of the use of carbonate of ammonia in the developer, he said it had a powerful retarding action, and kept the paper clear.

Mr. PRINGLE said that carbonate of ammonia was one of the most unstable compounds he knew of. It was often encrusted with bicarbonate of ammonia, which, he thought, acted as a restrainer. It was well known that this had to be guarded against in developing collodio-bromide plates. Referring to caustic alkalies, he said he found that they did not keep well.

Mr. BOLAS said that dilute solutions of caustic alkalies did not keep well. Any developers made with caustic alkalies were uncertain in their action.

In reply to another question, Mr. WILSON could not say whether, after the soaking in the bromide solution, the whole of the deposit was converted into bromide.

A vote of thanks to Mr. Wilson concluded the proceedings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 19,—Mr. A. Mackie in the chair.

Mr. T. E. FRESHWATER drew attention to a circular relating to a forthcoming Optical and Photographic Exhibition at the Royal Aquarium, in which reference was made to the fact that charges for space, &c., would be th same as at the Photographic Society's Exhibition. The frequent occurrence of the word "Society" in the circular referred to led Mr. Freshwater to ask what Photographic Society was organizing the Exhibition?

It was suggested that the word "Society" related to the Aquarium Society but it appeared to be thought that the circular might have been more explicit.

Mr. P. EVERITT said he had been informed, on good authority, that a rectilinear lens, including an angle of from 40° to 45°, and having as flat a field as the Goerz lens, could be made very inexpensively. He asked for information on the point.

No information was forthcoming.

Mr. J. E. HODD remarked that, in making up an acid fixing bath according to the formula of Dr. Andresen (viz., soda sulphite, sulphuric acid, and hypo) he sometimes obtained a yellow precipitate, presumably a sulphur compound. He asked whether this implied any difference in the composition of the hypo?

It was suggested that this was possibly the case, but that the conditions should be varied to ascertain whether it was so.

The CHAIRMAN drew attention to a formula in the *Photographer's Diary*, in which it was directed to dissolve six ounces of soda sulphite in ten ounces of water.

A competition in the production of negatives suitable for photo-mechanical reproduction was decided upon, and, after various suggestions, it was decided, *nem. con.*, that the front page of THE BRITISH JOURNAL OF PHOTOGRAPHY be the object to be photographed and reduced to half-plate size.

After other discussion, the meeting closed.

PHOTOGRAPHIC CLUB.

JULY 18,—Mr. Foxlee in the chair.

Mr. Charles Wallis, proposed by Mr. Sinclair and seconded by Mr. Tottem was unanimously elected a member.

The HON. SECRETARY said that Mr. H. M. Hastings had given him some prints to show to members, which were examples of what could be done by the method he suggested the previous week (*re* degraded platinotype paper).

Mr. W. E. HALSE showed a print on Obernetter's emulsion paper, bought in 1887. It was agreed the result was equal to new paper.

Mr. J. R. GOTZ said that Mr. Halse might well claim a record for his print. He could certainly endorse the opinion as to the good qualities of Obernetter's paper. He had sold some nearly four years ago, which had been carried to New Zealand, and made a triple journey through the Red Sea. A short while since, on being used, it was found in good condition.

The question of an outing on Bank Holiday was discussed. The districts of Eynesford and Shoreham were decided upon, and Mr. BEDDING kindly volunteered to pilot the party.

The CHAIRMAN said he had much pleasure in informing members that Mr. R. P. Drage had been elected to the office of Hon. Secretary to the Convention, in succession to Mr. Cembrano, jun., resigned. Both these gentlemen were old members of the Photographic Club.

DETERMINATION OF PLATE SPEEDS.

The discussion on the determination of plate speeds was then proceeded with.

Mr. A. COWAN said that his few remarks would be based upon, and confined to, Messrs. Hurter & Driffield's system. By some large drawings he showed how the system was carried out. In his earlier practice he found that he could not obtain the same reading from the same plates on successive days. This was due to the unsatisfactory, but so-called standard, light—a candle. After many experiments with Mr. Driffield, he had decided to use a check plate, so that, if a plate recorded wrongly, he simply slid the rule to or from the point read to the known value, with the result that, after many months—in fact, as long as two years—it was possible to give the exact speed, although it read very differently from the original reading. Replying to a question by Mr. Fry, he said there was a developer factor to take into consideration.

Mr. R. CHILD BAYLEY said that a point that occurred to him, which required some explanation, was that, to obtain a perfect transparency, it was first necessary to obtain a perfect negative. Messrs. Hurter & Driffield's definition of a perfect negative was such that, whilst it might be theoretically correct, it would be of no practical value.

Mr. JAMES CADETT followed by pointing out that in the future determination of plate speeds the Hurter & Driffield method would certainly be adopted. He thought great credit was due to them, and they were really the first who had attempted to define the proper relation between density and speed. The system undoubtedly had suffered from the first for the want of a standard light. His own experience had made this clear to him. Referring to the proceedings of a committee appointed by the Board of Trade to consider the question of a standard light, he said that a Pentane Argand had been decided upon, and that now it simply remains for Parliament to pass the Bill for such light to become universal. His experiments with this lamp had not shown an error of more than 2 %. In addition to having a standard light, it was also necessary to have a standard developer. Pyro-acid, at its present low rate, could not be relied upon. It was generally acknowledged that ferrous oxalate should be the standard.

Mr. B. J. EDWARDS said that, whilst giving Messrs. Hurter & Driffield all credit for their experiments, he had yet to be convinced of the utility of the system, from the fact they were still without both a standard of light and of developer. He failed to see also why there should be so many speeds of plates. Three should be sufficient; the speed of one to be double that of another.

Replying to a question from Mr. Gotz, Mr. COWAN said that Hurter & Driffield used ferrous oxalate for developing.

Replying to a question from Mr. Sinclair, Mr. CADETT described the construction of the Pentane-Argand lamp, adding that he was expecting a pair from the County Council Office the next day. Replying to another question he said that he was using at present the Amyl-acetate lamp.

Amateur Photographic Association.—A Council Meeting was held, July 19, at 58, Pall Mall, to award the prizes, the Right Hon. the Earl of Rosse in the chair.—The minutes of the last meeting having been read and confirmed, the following members were elected: The Right Hon. Lady Saltoun, Mr. H. M. Studd, Mrs. George Young, Messrs. Arthur C. Evans and J. M. S. Walker. The Secretary (Mr. A. J. Melhuish) then laid before the Council the pictures for the current year, which had been arranged and classified by Mr. Glaisher. Class I. contained 175 pictures; Class II., 116 pictures; and the remainder were included in Classes III., IV., and V. The following prizes were awarded:—First prize, a large silver goblet, for Nos. 61, 67, and 69, to Mr. F. G. Smart; second prize, a silver goblet, for Nos. 64, 380, 455, and 500, to Mr. R. O. Milne; a silver goblet, for Nos. 104, 117, 125, and 132, to Mr. C. Stephens; a landscape album, for Nos. 243, 246, 248, and 250, to Mr. R. Leventhorpe; a silver medal, for Nos. 1, 2, and 3, to Lady Saltoun; a medal, for Nos. 1, 4, and 10, to Dr. Drew; a landscape album, for Nos. 126 and 128a, to Mr. W. J. Harrison; a medal, for Nos. 1 and 2, to Mr. H. M. Studd; a portrait album, for Nos. 3 and 9, to the Viscount Maitland; a medal, for No. 7, to Mrs. George Young; a portrait album, for Nos. 3 and 7, to Mr. J. C. Cohen; a landscape album, for No. 8, to Mrs. Wrigley. A vote of thanks to Mr. Glaisher was proposed by the Lord de Ros for the time and attention he had kindly given to the arrangement and classification of the pictures, and passed unanimously.

Brixton and Clapham Camera Club.—July 17.—Specimens of Messrs. Elliott Bros.' Barnet plates were distributed. Considerable discussion took place on the subject of backing plates, which it was unanimously agreed should always be done in order to secure the best results and absolute freedom from halation.

Hackney Photographic Society.—July 17, Dr. Roland Smith presiding.—Mr. DEAN gave report of excursion to Carshalton on preceding Saturday. Members' work was shown by Messrs. Roofe, Penny, Dignam, and Richardson. Mr. SODEAU read a paper on *Orthochromatising*, to the following effect: "As the sensitiveness of ordinary silver bromide was greatest to the blue, and smallest to those colours, yellow and orange, which appeared brightest to the eye, it followed that some means of correcting this was desirable. There were several ways of doing this. Colour sensitiveness, to a certain extent, could be obtained by the use of highly ripened emulsion; but as this was somewhat difficult to make, and did not keep very well, it was better to use the other method—viz., the addition of certain dyes to the emulsion, either by mixing them before coating the plates, or by bathing the ordinary commercial plate. As very few took the trouble to make their own plates, the speaker proposed to treat of the latter method only. The principal dyes used were eosine, erythrosine, rose Bengal, and cyanine. They were all sensitive to light, and each was bleached by the particular rays it absorbed. Of the four above named, cyanine and erythrosine were commonly used, the latter sensitising for the yellow and yellow-green, and the former to the orange and orange-red; in fact, it was almost the only sensitiser for that end of the spectrum. An alcoholic solution of chlorophyll was recommended by Mr. Ives, but he (Mr. Sodeau) had not tried it. Cyanine was an expensive dye (1*s.* 11*d.* per gramme), but, as one grain would make a quart of sensitising solution, the cost was not excessive. Stock solutions might be made as follows:—1. Erythrosine, 1 part; water, 1000 parts. 2. Cyanine, 1 part; alcohol, 2000 parts. 3. Ammonia, 10 per cent. solution. Distilled water should be used for any solution containing ammonia, otherwise there would be a precipitate. For the cyanine solution rectified spirit should be used. If the stock solutions were kept from light by wrapping brown paper round the bottles containing them, they would keep for a long time. To sensitise plates for the yellow and yellow-green, bathe for two minutes in a solution of erythrosine, 1 in 10,000, made by adding 1 part of the stock solution to 9 parts of water. The effect of the dye was not obtained if the plate were used wet. Mr. Sodeau dried his by placing the bathed plates after draining in a drying rack, and then putting all together in a biscuit tin containing some calcium chloride. Plates placed therein at night would be dry by the morning. It had been said that erythrosine would not work properly without ammonia, but he had found this to be incorrect, and showed, as an example, a spectrum photograph on an erythrosine-dyed plate, which had been used without ammonia. Again, some recommended the addition of silver nitrate in various ways to the dye solution. From experiments he had made, Mr. Sodeau was led to believe that the addition of sodium and silver nitrate and ammonia respectively only had the effect of increasing the general sensitiveness, and not the colour sensitiveness. The results with an erythrosine-dyed plate were like those to be obtained on commercial isochromatic plates, so there was no advantage in sensitising one's own plates for ordinary purposes; but when it was desired to extend the action into the orange, then plates should be bathed in the following combined solution:—Cyanine stock solution, 1 drachm; erythrosine stock solution, 1 drachm; ammonia, 10 per cent., 1 drachm; water to 10 drachms. The effect of this would be to raise the sensitiveness of the yellow-green, yellow, and orange, and lower that in the blue. The addition of ammonia was necessary when cyanine was used. In working the plates, a pure red light (tested by means of the spectroscope) might be used when working with erythrosine, but when cyanine was used, the plates must be worked in a very dim light indeed, and kept shielded from that as much as possible. Erythrosine-bathed plates would keep about six weeks, but those sensitised with cyanine should be used as soon as possible, not more than a day from time of sensitising. The exposure should be full, not too much so, but sufficient to allow the use of a fairly well-restrained developer. The general sensitiveness was about the same as an unbathed plate of the same kind. After reading the paper, Mr. Sodeau cut a plate into halves, and, after bathing one half in the combined cyanine and erythrosine solution, exposed the two together in the camera to the spectrum of a paraffin lamp flame. After development, the contrast between the two was seen to be very great. In the unbathed half the light had only acted towards the blue, but in the bathed half the sensitiveness at the actinic end had been lowered, while the deposit on the negative had extended from the yellow-green to far into the orange, the maximum being in the orange-yellow. In answer to various questions in the discussion which followed, Mr. Sodeau said that staining did not slow the plates, that it had no effect on the question of halation, that he had tried to get sensitiveness to orange by bathing commercial isochromatic plates in cyanine solution without result, and that he did not find that cyanine caused fogging. He thought that cases of fog which might have occurred to have been due to light during sensitising and development. It was necessary to remember that a cyanine-bathed plate was sensitive to any kind of light.

North Middlesex Photographic Society.—July 16, Mr. C. Beadle in the chair, the subject being *Development*, which was capably handled by Mr. H. SMITH.—In the course of his remarks, which covered a large field, but with a decided preference for that portion relating to landscape work, he said that, although he was well aware that scarcely a half-dozen people worked in the same manner, each having his own ideas, his own favourite developer, and manner of using the same; but what did that matter as long as you attained the result aimed at? Failures we all had, no matter how clever we might be; but, if it was possible to prevent some by a little more care in mixing and using the developer, then why not take that care? Mr. Smith advocated the use of pyro-ammonia "in preference to any of the newer forms of developer" for plates. Do not be in a hurry to develop your plates, give them plenty of time. Do not try and break the record, half-a-dozen plates in so many minutes will not do. Mr. Smith recommended using the developer made up in ten per cent. solutions, and preferred to bring the details of the subject well out, first by the use of a developer weak in pyro, and bromide, and ammonia, then to gain printing density by using a stronger developer with a small quantity of ammonia to start with, afterwards adding as required. He thought dense negatives gave better prints than thin ones. Mr. Smith then illustrated his remarks by developing a plate in the presence of the members, which turned out, as Mr. Smith's negatives usually do, a success. A running fire of questions was then put to Mr. Smith by the various members present, all having a little something to ask—some little trouble which they had met with. It might be stated that Mr. Smith always uses films seven and a half by five, and he said that they gave him every satisfaction. This opinion was not generally agreed with.

Putney Photographic Society.—July 13, Outing to Strand-on-the-Green, near Brentford.—This is one of the most quaint riverside places on the Thames, a well-known haunt of artists, affording many opportunities for making pictures, especially if visited at low water, as it was last Saturday, which the members, under the leadership of Mr. H. Faulkner, took advantage of by exposing a fair number of plates, with the almost certainty of securing good results, there being an excellent light and plenty of clouds about; and it was generally regretted when, owing to the rapid rise of the tide, the party was obliged to beat a hasty retreat. After partaking of tea together, a group was taken, and some amusement caused by a small boy whose services had been impressed to make the cap exposure, in spite of previous instructions, asking whether he was to put the cap on again in the midst of the exposure.

Woolwich Photographic Society and Leytonstone Camera Club.—On Saturday last the above Societies visited Bexley. The meet was at Woolwich Arsenal Station, whence the Clubs proceeded by omnibus some five or six miles, when the members divided into several parties, under the able leaderships of Colonel Davies, Dr. Sunderland, and Messrs. Reeves and Gosling. Some pretty landscapes, with waterfalls and river scenery, were secured, the members reassembling to a sumptuous repast, kindly provided by Dr. Sunderland. After passing very hearty votes of thanks to the leaders for their kindness in conducting, and to Dr. Sunderland for providing the tea, the party returned to Woolwich by brake, thus bringing a very enjoyable day to a close. On Saturday next the Leytonstone Camera Club intend visiting Broxbourne and Rye House, under the leadership of Mr. C. A. Russell. The Club will proceed from Liverpool-street Station by the fifteen minutes past two train, arriving at Broxbourne at forty-five minutes past two.

Ashton-under-Lyne Photographic Society.—July 14.—The local devotees of the camera enjoyed a grand day at Lincoln on Saturday. There were over eighty in the party, thirty-seven of whom brought their apparatus with them, and over 400 plates were exposed. No clouds obscured the sky, and there was no wind to shake the cameras or sway the trees. There was not the slightest hitch in any respect from leaving Ashton to returning. Of course, these are matters of pure good fortune. There are times when everything goes wrong, and the tale is one of unredeemed disaster. The photographers appear to know by an infallible instinct when the weather is going to be bad, and none of them turn up. The instinct assured them on Saturday that they might rely upon the day being one of the best that ever dawned, and so it turned out to be. Lincoln Cathedral is a splendid object to photograph, and we may venture to suppose that it was never so much photographed on any one day during the long course of its splendid existence as it was on Saturday last. The Ashton Society is going to have another exhibition towards the end of the present year, and we have no doubt Lincoln Cathedral will figure conspicuously among the exhibits. On Saturday the party were favoured with the company of the Rev. Thomas Green, who, in a speech at dinner, hazarded the remark that photography was specially adapted for architectural subjects. It is difficult to tell what it is not adapted for. One would think that a bouquet of flowers was an entirely hopeless subject, as colour enters so largely into their composition, yet it only heightens one's admiration for those superb productions of nature to find that when their mere colourless form is thrown upon the screen they are still amazingly beautiful. Still it is quite true that photography is most effective in dealing with subjects which present an infinite variety of form and of light and shade without any special variations of colour. The front of Lincoln Cathedral has held its cheeks meekly to the buffetings of the elements for seven or eight hundred years, and they are now "sicklied o'er" with the palsy, in the "sere and yellow leaf," blasted with all the evidences of antiquity. These hues enter very forcibly into the impression produced by such a pile, and they cannot be adequately reproduced by photography, nor even by the deftest colourist who ever wielded the brush, for that matter. When photography in colours has been achieved, so that any of our Ashton photographers may take a coloured picture without more ado than one in black and white, we may hope to see a really satisfactory picture of this old cathedral façade

Capetown Photographic Club.—The June meeting of the members of the Capetown Photographic Club assembled to give a welcome to Sir Benjamin Stone, the President of the Birmingham Photographic Society. The chair was occupied by Dr. Gill (the President), who was supported by Mr. Andrew J. Fuller and Mr. T. W. Cairncross. Sir BENJAMIN, who was greeted with loud applause, expressed his pleasure at meeting members of the Capetown Club, and briefly referred to the value of photography to science. He had always endeavoured to encourage what he might term the useful side of photography, and he objected most strongly to the hand camera, as he thought it was detrimental to photography, and it was vulgar and inartistic. One had no right to take one's friends at a disadvantage; the results obtained, in his opinion, were never satisfactory; the hand camera took away all pleasure, and nothing was gained by its use but the loss of the confidence of friends who were willing to sit. It was always his opinion that the more carefully photographic work was done, the better it is; at the same time much time and trouble were expended in trying all kinds of experiments. He once knew a gentleman who admitted that, in his opinion, there were twenty-four cardinal sins committed over photography, and he had committed them all; he was in the habit of swearing a good deal, and he had to coin a few words because he had exhausted all his vocabulary. He wished to point out that travellers' tales were no good nowadays, people wanted something they could rely upon, and, now photography had come to the assistance of the traveller, it was the slave of science, and he felt himself the slave of photography. He had had the advantage of extreme travel, and he thought that travelling and photography went very much hand in hand; it was only when one arrived home that one could estimate the value of it; one is apt to forget, until looking over souvenirs of what had been seen, and it then becomes a source of perennial enjoyment to yourself and friends, enabling to recall, and to share with others, the pleasant and instructive experiences of the past. Dr. Gill had asked him to recount some of his experiences in Brazil when he went there in connexion with the eclipse of the sun. Well, when he arrived at Brazil, there was a revolution, an upheaval of common occurrence. A revolution in South America is, however, amusing, and quite different from what one would imagine would take place in Europe. It was not quite so serious. When one went to town, the question was always asked, Have you had a revolution lately? At Sera, a large town in Brazil, the British Consul very kindly gave him three photographs of the latest up-to-date revolution. It appeared that the Commandant of the troops was dissatisfied with the Governor, so he sent word that he must clear out. Great preparation was accordingly made, streets were blocked up, guns placed in position, and then they sent for the noble photographer to take them. That was photograph No. 1. The palace was duly bombarded, and the Governor had to run for his life, the victorious troops entered, and were again photographed being in possession. That was No. 2, and the third photograph was a view of the ruins, so that it would be seen that photography plays an important part in a Brazilian revolution. At another great city the British Consul related the following incident:—"In the middle of the night he heard a great disturbance, and put his head out of the window to inquire 'what's the matter?' A revolution. Oh, is that all? He then went to bed again, but found it was useless to try to sleep, and gave up the attempt, as there was so much noise. The result of the rising was that the Governor of the town was driven away, and the Commandant took possession, and installed another Governor. Three days later the ex-Governor was promenading in one of the public squares, and ran up against the Commandant, who greeted him cordially, and said, "Oh, it was all a mistake, and if you like I'll put you back again!" To which the ex-Governor consented. They shook hands, and went to the place where the new Governor was sitting in State surrounded by his officers. (I must mention that in Brazil they do not speak of a revolution, but call it a firing out.) The Commandant asked the new Governor if he had heard from Rio? No! "Well, look here, you'd better go, or I shall fire you out." It was done in a moment, all shook hands, and the strange part of it was both parties joined in a public funeral given in honour of those killed, everybody cried, and, after it was over, things went on all right again for a while. Such are some of the incidents connected with the eclipses of the sun as observed in Brazil. There were a good many curiosities connected with photography, and of these he would mention the pigeon letters and pigeon post. During the Franco-German War, when Paris was invested by the Germans, communication was kept up with the outside world by means of pigeon post between England and France. News was printed and reduced by means of photography to a size an inch square, the paper was rolled up and put into a quill, and placed under the wing of the bird. When the pigeon arrived in Paris the contents were thrown out by a process on to a large screen, so that all Paris could read the news; of course this could only be possible by means of photography. He also possessed a couple of photographs to which there was a slight scandal attached; they were taken in Siam. The subject was a number of men condemned to death; the first one was when they were awaiting execution, and the second "with their heads off." Another curious photograph he had was one of a cannon ball being fired, when, not only was the shot visible, but the air waves caused by the shot could be seen in the photograph. He impressed upon the members the necessity of working for some definite object; they had splendid opportunities, a fair field for work, and they should realise it fully. In Birmingham a useful work had been accomplished, and some 2600 views, fully describing the district, and giving as much detail as possible, were placed in the Free Library. They must remember that every unit of work assists science, and gives great happiness to mankind generally. Mr. W. Cairncross, on behalf of the Club, thanked Sir Benjamin Stone for his attendance, and proposed that he should become an honorary member of the Club, which was carried with acclamation. Mr. Frank Cartwright was responsible for the decorations of the hall, and various musical selections were given by the Misses Fuller and Wood, and a very pleasant evening was concluded by the exhibition of several beautiful views from photographs by members of this Club, shown by Messrs. Fuller and J. R. Wignall.

THE rooms of the Photographic Society of Great Britain will be closed from July 25 to August 25, both inclusive.

FORTHCOMING EXHIBITIONS.

1894.	
July 27–29	International Photographic Exhibition, Arnhem, Holland. Alb. Kapteyn, 82, York-road, King's Cross, London, N. (Member of the Committee for the United Kingdom), and G. S. de Veer, jun., Velperweg, 94, Arnhem, Holland.
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road South Hackney.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A NEGLECTED FIELD OF PHOTOGRAPHY.

To the EDITOR.

SIR,—The apparatus described by Mr. Hepworth at the Convention is most valuable, but his claim of novelty as regards the glass stage is open to question.

I have for a long time used a sheet of glass as a support for small articles, flowers, &c., when photographing them, placing the background at some distance in order to avoid shadows. The plan has been described by a writer in one of the journals or almanacs.

I have usually placed the glass in a vertical position, fastening the object to it with a cement of beeswax and balsam, but, in the case of objects which cannot conveniently be cemented, I have on numerous occasions photographed them on a horizontal sheet of glass, the camera being directly above as described by Mr. Hepworth. In my set of slides on bee-keeping, shown at the last Pall Mall Exhibition, the photograph of all stages of larva and pupæ of the bee (from egg upwards) was taken by laying the objects on a horizontal sheet of glass, with a brown paper background some distance below. I have photographed apples in the same way, and have described the method at a meeting of the Herefordshire Photographic Society.—I am, yours &c.,

Hereford, July 21. ALFRED WATKINS.

THE CONVENTION GROUP.

To the EDITOR.

SIR,—Allow me to ask you if the collotype group presented with last week's number of the JOURNAL represents an example of to-day's standard of photography? If so, then surely we cannot boast of any improvement since the days of wet plates, and it shows distinctly how far away we are from an artistic point in photographic work.—I am, yours, &c.,

Crown-street, Liverpool, July 23, 1894. F. B.

COMBINED *VERSUS* SEPARATE TONING AND FIXING.

To the EDITOR.

SIR,—Your correspondent Mr. Bishop raises the whole question of combined *v.* separate toning and fixing in his letter. I, for one, will be greatly pleased if the discussion it elicits results in some definite agreement of the value of the two methods. A few notes from my experience may help in the controversy. *Imprimis*, I would mention, however, that I have always obtained the best results on gelatino-chloride papers from a combined bath.

When Liesegang's paper came on the market, I tried various formulæ for both separate and combined baths, but ultimately had to agree with the maker's recommendation to use the latter form. With a very considerable diminution of the sulphocyanide, I hit on a very good formula. Subsequently with celerotype and the many other papers which followed the success of aristotype, I found that a modified combined bath gave excellent results. Certainly I can complain of no lack of permanency, nor of yellowing in the whites. The deposit from a carefully prepared bath would naturally be supposed permanent, and I have found it quite as permanent as, say, the prints from a sulphocyanate separate bath.

For a detailed description of the chemical reactions which are *supposed* to occur in the combined bath, I would refer Mr. Bishop to Valenta's paper in *Phot. Corres.* xxix. 280, *et seqq.*; but probably he has seen this. Nevertheless, the *actual* decompositions in such baths are very obscure, and much remains to be decided. For examgle, is fixing complete before toning commences, or are the processes simultaneous?

One can very well understand the various makers differing so much as to which bath is most suitable for their papers; so many considerations

have to be met, and these vary under different emulsion formulæ. For instance, the manufacturer may have to decide on points such as these: (1) The organic salt or acid used to preserve and give vigour to the paper; (2) the gelatine itself; (3) the colour of the printing image. Many more could be added, but those will do as illustrations. Suppose the paper contains a high percentage of organic acid as a preservative—and many commercial papers do so—on immersion in an ordinary combined bath such papers would cause a liberation of sulphur and sulphurous acid from the hypo, and we would have sulphur toning with a vengeance. Nevertheless, it is perfectly possible to make a combined bath which shall tone such papers without this drawback.

Again, as to the gelatine, the maker must consider the softening effect of the sulphocyanides on the film. A hard gelatine may not be used exclusively in paper-coating, since it gives an undesirable film and, above all, will not yield a vigorous image. Ehrmann has stated that lead salts exert a solvent action on the film; be this as it may, the sulphocyanides certainly do so. Hence it is easy to suppose the maker takes such into consideration when fixing on a formula. Still I insist that a combined bath can be prepared which will *harden*, rather than soften, the film.

Our other point refers more to the user than the maker of the paper. It is useless for people to maintain that gelatino-chloride papers require slight printing for *any* combined bath. We must have a good depth of image to work upon; for any bath it requires good printing, but for the combined bath it wants over-printing. Now, the depth of printing is more difficult to determine in papers which print with a bluish tint; for, the colour being so rich, it is more difficult to tell when we have printed far enough. Hence such papers appear to lose more in the bath than they ought to, leading to waste, and perhaps an impatient condemnation of a really good article. One can understand a maker shrinking from such a risk.

As regards permanency, Valenta came to the conclusion that paper toned and fixed together was as permanent as any other; subjected to ozone, even more so. Many others bear out this opinion, and I believe that Dr. Eder supports such an idea. I have given my experience above; it has always seemed a most sound principle to work, and I am persuaded that not combined toning and fixing is the cause of the failures, but that defective formulæ and subsequent careless manipulation are the cause of failure. In building one's bath it is as well to calculate how much paper we are to tone in it, and, bearing this fact in mind, see that there is enough fixing agent present to fulfil the requirements. Another thing is to separate as much as possible of the precipitated sulphur caused by acidifying the sulphur, and allow the bath to ripen well. Again, if lead salts are used, we must have a sufficiency of "corrective" salts present to prevent the decomposition of the lead thiosulphate, for lead salts in any large quantity in the paper certainly don't help to preserve the image. Those points all make for permanency. One of the most important items is the washing—this must be thorough; and, given that with a well-prepared bath, there can be no doubt of the permanency of the image. That is, as far as silver processes can be permanent.

What we want in a combined bath is one that will harden the film, which will fix the prints to the last drop, and not get clogged by the silver extracted from the paper; that will keep the whites clear and brilliant, and do away with the curse of double tones in gelatine papers. Such a bath would be similar to some of our advertised medicines; still I hear that there are prospects of a good bath coming before the public, and I devoutly hope it is true, and that the makers will consider the above requirements.

There is a vast amount of work to be accomplished before we can say yes or no to Mr. Bishop's query. For my part, I have said yes, and I hope that a most profitable discussion will take place.—I am, yours, &c.,

London, N. J. B. FINDLAY.

To the EDITOR.

SIR,—Mr. W. Bishop's letter in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 13th inst. brings forward a very important question so far as the professional photographer is concerned, and who desires permanency in his work. I myself noticed in your "Answers to Correspondents" that you condemned the use of a combined bath, no doubt with good reasons. I myself maintain as a worker of both Ilford and Solio paper with the combined bath that, if care is taken (and I admit great care must be taken), the combined bath is capable of giving quite as permanent a result as with the separate toning and fixing. I speak of the formula as given by the Eastman Company for Solio. Of course, under no circumstances should the bath be used more than once. One great objection I see to its use is that, in the hands of a careless assistant, the results would, no doubt, turn out disastrous. I enclose you prints by the combined bath. The whole-plate is on P.O.P., the cabinets on Solio white paper, which have been in strong sunlight for some weeks. These having been carefully finished, I should be pleased for them to be submitted by the side of prints separately toned and fixed, to any test you may think proper to determine *as to* their permanency. One great reason why I prefer the combined bath is because I can get twelve prints of a rich sepia tone, and more alike and evener than I can with the separate baths. Another reason is that the prints can be taken out of the water, blotted, and dried before the fire if need be, without the risk of the gelatine running; in fact, the print can be placed in boiling water without injury, the surface being practically insoluble. Would it not be as well, sir, if those of your readers who use a combined bath would give their experience as to the permanency of the results so obtained, at least so far as they may be able to determine? If this were done, no doubt it would do away in a great measure with the strong prejudice which at present exists as to its use. I enclose my card, and beg to remain, sir, yours, &c.,

A BELIEVER IN THE COMBINED BATH.

July 16, 1894.

To the EDITOR.

SIR,—Kindly allow me to thank Mr. Herbert S. Starnes for his contribution to the scientific discussion of this question.

Read in its inwardness, his letter practically involves an indictment of gelatino-chloride papers as difficult, if not almost impossible, to free from traces of deleterious compounds, and I have no doubt the chemical advisers of the manufacturers will take up and continue the story to the benefit of consumers generally. I am not a chemist, my chemical knowledge is only sufficient to show me how much I am ignorant of; but you may possibly remember, sir, that when these papers first appeared in public, with the combined bath formula, I mentioned to you how strangely contradictory from an old-fashioned point of view the ingredients appeared to be. But I presumed the manufacturers had practical reason on their side, and worked accordingly.

Although strictly an amateur, I do not think I can class myself as a "careless" one, and it is in the interest, as I believe, of careful, thoughtful workers that I have raised the present question. With thanks to all those who do so freely help to enlighten inquirers,—I am, yours, &c.

London, N. WM. BISHOP.

PERMANENCY OF PHOTOGRAPHIC PRINTS.

To the EDITOR.

SIR,—We hear a good deal said sometimes of the impermanence of photographic prints. My own experience tells me that when they fade the defect is attributable to imperfect washing rather than to any necessity, in consequence of the impossibility of removing the traces of the clearing solution. I do not claim for such prints an indefinite durability, but I do say that they will last (when properly treated by the photographer) as long as *the living persons who are interested in them.* I say this because I have in my possession two copies of pencil drawings taken in Queensland. They were copied by the camera, and prints taken from the negatives, the date on one being June 18, 1862, and both were sketched about the same time. The photographer who undertook the operation was Mr. Horatio Nelson King, who then had a studio in Milsom-street, Bath, and now resides in London, I believe. They were framed so soon as they were sent home, have been hung on a dry wall, and manifest no tendency to fade. I could have wished that Mr. King's lens had better covered the sketches, but in every other respect I am more than satisfied after the thirty-two years they have been in my possession, and I have pleasure in bearing testimony to the excellence of his manipulation. He will recognise my signature, I think.—I am, yours, &c.,

G. HARVEY WOOD.

Bath, July 12, 1894.

AN OPERATOR'S GRIEVANCE.

To the EDITOR.

SIR,—It is to be regretted that the words "none but first-class men need apply" being inserted in an advertisement for an operator and retoucher is no guarantee that the place of business is in keeping with the respectability of a first-class man. It is extremely disappointing to an operator of ability, who has replied to an advertisement of the kind and been accepted, when he discovers the advertiser's establishment is nothing more nor less than an iron-roofed shed planted on the edge of a common, and his employer an individual who keeps up an appearance by wearing about his neck a dirty white muffler, an old peak cap, and a not too clean face. If these gentlemen, when advertising for a "first-class man," would modestly intimate that theirs is a "one-story affair," applicants would have some idea what to expect.—I am, yours, &c., LIGHT.

July 18, 1894.

HE CAME TO TAKE THE BANK.—The Standard Bank at Estcourt, Natal, says the Natal *Witness*, is not a substantial building, and when a young man of the refined burglar type strolled in and said, "I have come to take the bank," the affrighted clerk turned pale, and felt for a pistol, until the acting manager rushed from his private office and bravely seized the supposed burglar. It was during his violent struggles that the young man explained that he merely wished to obtain a photograph of the building, and would the acting manager and his clerk kindly step outside and grace the foreground with their presence? Eventually they graced.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange large imitation rock for carved studio table.—Address, GEORGE MOORE, Buckfastleigh, Devon.

Wanted good whole-plate outfit in exchange for royal Singer pneumatic bicycle.—Address, A. SMITH, 17, Parchment-street, Winchester.

Will exchange Seavey accessories and backgrounds for a good tricycle, modern pattern.—Address, A. F. COLBORNE, Photographer, Canterbury.

Laverne's 9×7 single lens, cost 3*l.* 10*s.* as new; exchange for hand camera, banjo, violin, or suit length cloth.—Address, W. HARE, Photographer, Sutton, Surrey.

An Eclipse copying machine, quarto size, complete, in working order, original price two guineas; will exchange for background or accessory of equal value, must be in good condition.—Address, JOSIAH R. CROSSE, 44, Watergate-street, and 3, Bull-ring, Whitchurch, Salop.

Wanted, 10×8 rapid rectilinear lens by good maker, in exchange for either of the following, viz., one pair Dallmeyer stereographic lenses, or one pair Taylor, Taylor & Hobson five-inch rapid rectilinear lenses. Cash adjusted according to value.—Address, W. SIEWART, care of Chalmers, 4, Cowan-street, Hillhead, Glasgow.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Debenham & Co., York.—*Photograph of Mr. Battye Langley, M.P.*

John Stuart, Glasgow.—*Two photographs of George Alexander Johnstone Ross.*

George Watmough Webster, Chester.—*Photograph of Dr. Bridge, of Chester, in gown and hood.*

Charles Edward Wood, Darlington.—*Photograph of Hat and Feathers Inn, Darlington, and shop and cottages adjoining.*

John William Hilder, Matlock Bath.—*Photograph of High Tor, Matlock Bath, Derbyshire (snow scene in winter).*

H. B. STRONG, Agri, Cynicus, and others.—In our next.

DR. H. W. VOGEL.—Received when going to press. Will appear next week.

J. A. RUTHVEN.—Thanks for your hint, which will be attended to, probably, in our next.

PRINTER.—The more pronounced spots are due to the rust on the metal vessel in which the prints were washed. The others appear to be due to imperfect manipulation.

A. W. T.—It is very clear that the plates are defective. As the "streaky, curly" markings can be seen on them when they are put into the slides the same as they are in the finished negative, they are not due to anything in the development.

WEBER & SON.—From a careful examination of the markings in the negative we conclude that the particular emulsion must be at fault. The markings are *in* and not *on* the surface of the film, and, in our experience, are not such are producible by faulty development.

W. BLACKMAN.—You are quite right, there is a considerable lack of brilliancy in the print, but it is impossible to indicate the reason, as it may arise from many causes. We should advise you to get a little instruction from some one who is *au fait* with that kind of work.

PUZZLED.—It seems, so far as one can judge from looking at the print, that the spots are due to something in the working, probably air bells sticking to the surface of the prints when they are first put into the fixing solution. The toning bath has nothing to do with them.

WILTS.—The complaint is a very common one. As a rule, negatives made on very rapid plates have a much more granular appearance than those made on slow ones. There is no actual reason why it should be so, as some of the fastest plates we have used and made have had a very fine grain.

C. J. F. asks: "Can you kindly inform me (1) if a photograph, the work of a photographer lately deceased, can be registered by his successor in the business, say his wife or son, for copyright purposes? also, (2) if the copyright in any photograph held by a photographer becomes void at his death?"—In reply: 1. No. 2. The copyright holds good for seven years after his death.

ALLEGRO.—As the spots appear with different baths and under different circumstances, the cause must be looked for in the manipulations, but in which direction it is impossible to indicate by merely seeing the print. It might be well to try a different make of hyposulphite of soda, as we have seen spots, not unlike those on the prints sent, that were due to the hyposulphite.

STUDENT.—It is impossible to have one lens to take full-length *carte* and cabinet portraits in a studio fifteen feet long. The shortest focus *carte* and cabinet lenses catalogued by the best makers require fourteen feet between the sitter and the lens for a full-length figure, consequently full lengths cannot be taken in a fifteen-feet studio. However, by having two lenses half and three-quarter length can be taken. Consult opticians' catalogues.

T. N. P.—1. Retouching medium is what is generally employed. Some mediums are better than others, possibly you have been using one that is not well suited to your method of working. If with some negatives you can get on better without the medium, we should suggest that the negatives be treated according to circumstances instead of dealing with all alike. 2. Formulæ for reducing negatives will be found in the ALMANAC for the current year.

BROWN.—Quite impossible to give any idea of the cost of putting up a studio without knowing its proposed size and the form it is to be. Both the books named contain designs of good studios, therefore select the one that suits your taste and requirements best, and then get an estimate for its construction from a local builder. A studio can, of course, be erected in some localities for much less than it can in others. Oftentimes the approaches to, and the alterations of, the main building cost far more than the studio itself.

THE SHERWOOD PHOTOGRAPHIC COMPANY say: "Would you kindly give any information you can as to the making of process blocks for illustrating a weekly newspaper? Is it a very difficult process, and would the cost be great for materials, or is there any book published on this special process?"—If our correspondents will study the article on "Modern Processes of Book Illustration" in the ALMANAC for 1893, they will find their question fully answered. Of course, practical instruction should supplement the information there given.

F. BENSWORTH asks how to obtain a thick film of collodion, pure and simple, about as thick as very stout paper or thin card? He says he has made collodion as thick as possible that will flow over the glass, and when the dried film is removed from the plate, it is so thin that it will not bear handling.—The best way is to use a very soluble pyroxyline, so that a large quantity can be dissolved in a small quantity of solvent. Then, if the plate be levelled on a stand, after being edged with a slip of paper, and the collodion poured on to a good thickness, according to requirements, a stout film will be obtained. Such a film will take a comparatively long time to dry.

RICHARD THE SECOND.—Generally speaking, you should be able to see the detail by transmitted light when development is completed, but much will depend (1) on the quality of your light, and (2) on the character of the plate. The less intense the light and the thicker the coating of the plate, the greater will be the difficulty of judging detail, and *vice versâ*. We do not know what you mean by the whites being of a "dirty drab colour." Density should be judged by looking through the negative. Could you not get some friend to give you a little practical assistance in development?

H. SYMONDS writes: "I have some dark slides, recently made, that make the plate insensitive where the material that forms the hinge is. There is a broad band of nearly clear glass, exactly corresponding to the material forming the hinge. Can you give me any advice about this? Is there any varnish that would cure it? Bates's black varnish, for instance."—This used to be a very common complaint, but it should not occur now. The only advice we can give is to return the slides to the maker, and get him to employ some of the inert materials for the hinges. We know of no varnish that would act as a protection for any length of time.

MR. A. L. HENDERSON, the delegate of the London and Provincial Photographic Association to the Dublin Photographic Convention, will at the meeting of the Association on Thursday, August 2, show a number of lantern slides, made from negatives obtained during the Convention. Visitors will be welcome.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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VERTICAL CAMERAS AND STANDS FOR THE SAME.

When giving a brief account of the exhibits in the hall in hich the Convention meetings were held in Dublin, we spoke a large picture, by Lafayette, in which a female figure was presented as flying in mid air. This figure, we have since een informed, was taken by a vertical camera, that is to say, he lady was posed when lying on the floor, and taken by eans of a camera pointed downwards at her from above. he success thus achieved was most undoubted.

Although, as we learn from a paper read at the Convention, patent has lately been sought to be obtained for the vertical mera, yet has it been more or less well known during a eriod of thirty years. About that time ago its construction and ses were brought under the notice of the now extinct North ondon Photographic Association by Mr. W. H. Warner, and ubsequently by Mr. William Hislop, both of whom read apers on its advantages, which were published in The British ournal of Photography of the period. Several were made bout that time, one of the best of them being, in our opinion, hat by the then well-known maker Ottewill, which we described in 1865, with a drawing, in this Journal.

By these appliances, which were universal in their nature, a amera could be pointed downward to the floor, upwards to he ceiling, or directly forward, and held with the utmost igidity in any of these positions. We shall describe the implest of the 1864 lot of universal tilting stands, which any ne can make for himself, or have made, at a trivial cost, remising that it will answer as well as the most elaborate.

On the top of the stand is screwed, by the usual thumbcrew, a small square of wood, on which the camera sits when n use. This wood is composed of two pieces hinged together t the front, so as to be capable of being opened like a book. One of these is attached to the triangle of the stand in the sual way, and the camera is affixed in a similar manner to he upper piece. By means of a slotted brass strap at each ide, the upper one, with the camera, can be raised up so as to tand at any angle, and then, by pinching a screw at the side, t is rendered quite rigid. When raised to stand at an angle f 90°, the lens and camera are, of course, pointing downward and in a position for photographing anything placed below.

At the time of the introduction of this system attention was directed to its value in the photographing of such objects s monumental brasses, or indeed anything which could be aid on a horizontal table below. Mr. Warner made a present of his idea to the photographic world, and said he disdained the idea of patenting it, as also did those who introduced modifications of the original stand.

Somewhat differing from the foregoing methods was one introduced by Mr. B. J. Edwards in 1877, in which the camera was brought to the level position on its own stand, and its vision directed downwards by an inclined mirror, one placed at an angle of forty-five degrees outside of the lens. The stage or table on which the articles to be photographed were placed was controlled by rack and pinion, and focussing was thus rendered exceedingly easy, very much in the same manner as are microscopic objects placed on the stage of a microscope, not of modern type but one of former years, in which the stage was actuated by the rack and pinion. This patent having now lapsed by efflux of time, it has become public property; still one can admire much in the idea pervading its construction.

A special form of head for a camera stand, fulfilling the same end, was made and extensively advertised by the American Scovill Company about a dozen years ago. It was very elegantly constructed of brass, with the primary intention of enabling, at a moment's notice, an ordinary landscape camera to be turned on end so as to present the plate in a vertical position, enabling a church spire, a ravine, or any object demanding height rather than latitude in the composition, to be taken in. The hinge of the small brass plate to which the camera was attached was at the side, and when, on examining the image on the focussing screen, the judgment of the operator determined that a vertical view of the subject would suit better than a horizontal one, it was only necessary to release a catch at the side in order to liberate a brass strut, by which the camera was immediately thrown on its side, as it were, and ready for the vertical view. We had one of these subsequently made in wood, and, before it had been an hour in existence, found that by turning the hinge to the front, and screwing on the camera so that its lens should face the hinge, it was just the thing for either a floor or a ceiling camera.

The uses of this kind of camera are manifold. If you wish to photograph a collection of coins, shells, jewellery, flowers, shrubs, or any *bric-à-brac* capable of being laid upon a table, all that is necessary is to arrange them and bring the table, which must by preference be a rather low one, below the inverted camera, and see that the light falls upon the objects so as to show them to best advantage. If an engraving, or even a photograph, is to be copied from a large and heavy volume which it would be difficult to erect before the camera in the usual way, then will the vertical camera prove the friend in need; it is only necessary to lay it open on the table, and it will be *in situ* and lighted to perfection.

THE DETECTION AND ESTIMATION OF THE HALOGENS.

II.

Regarding bromine, Messrs. Villiers & Fayolle, referring to the old well-known methods, say: "The qualitative estimation of hydrobromic acid in the presence of hydriodic acid may be effected easily when the proportion of the former is sufficiently large, by employing the well-known method founded upon the action of chlorine on the two hydracids in presence of carbon disulphide, which is successively coloured violet and then brown by the solution in this liquid of the iodine, and the bromine set at liberty, the chlorine water being added drop by drop, agitating strongly after each addition, so as to avoid the action of the excess of chlorine upon the iodine and bromine, and the consequent production of colourless compounds. But this procedure gives only bad results when the proportion of bromine falls below a certain limit. . . . . The brown colour which we may obtain after the violet colour . . . . cannot be distinctly recognised if the weight of bromine is less than one-tenth of that of the iodine present." They have, however, in the use of ferric chloride, found an almost perfect reagent. In the case of a silver precipitate, it is treated with sulphuretted hydrogen, and, after boiling, to expel the latter, their new method is brought into use. The liquid, which must be free from nitric acid, is mixed with an excess of ferric chloride (free from chlorine), about fifty parts of semi-normal solution being needed for one part of iodine presumed to be present. The latter quickly crystallises out if present in quantity. The mixture is then evaporated to dryness, and further heated for an hour or two on the water bath, which thus separates the iodine completely, and volatilises it, the hydrobromic acid being absolutely unattacked. It is taken up with a few drops of water, the iron precipitated with alkali, the filtrate supersaturated with hydrochloric acid, and chlorine water added drop by drop, while agitating with carbon disulphide. The liquid instantly takes a yellow colour, and the reaction is independent of the proportion of iodine originally present. The chemists named say of this method that "it may be compared in its precision to spectroscopic methods."

With regard to iodine, they again point out the difficulty of existing methods: for example, Duflos' with ferric chloride, potassium iodide, and "hypo," and others with nitrous acid. But, by combining the former plan with the use of carbon disulphide as solvent, we have obtained a procedure which enables us in a simple, expeditious manner to determine hydriodic acid in the presence of the other hydracids. The results are not inferior in accuracy to those given by the direct determination of free iodine by sodium thiosulphate, one of the most frequent of those employed in volumetric methods. It seems to us much preferable to the gravimetric methods generally in use. The exact process is as follows: Taking care again to see that the solution to be examined is free from nitric acid, it is placed in a bulb with a well-greased glass cock, and in which some carbon disulphide has been previously introduced. A slight excess of free ferric chloride solution is added in about the same proportion as recommended in the bromine process, the disulphide then decanted, a further quantity added, and again and again washed, till no colouration after agitation is produced, four washings generally sufficing. This carbon-disulphide solution is then well washed with water to remove the last traces of iron, and finally decanted into a well-stoppered glass flask. (If absolute accuracy is not wished for, this washing may be dispensed with.) The dissolved iodi determined directly by means of a standardised solutio sodium thiosulphate, the discolouration of the disulphide l readily brought about by agitation. "The accuracy of determination is not affected by the quantities of hydroch and hydrobromic acid present." The following result sl how reliable the method is, a solution of pure hydri acid obtained from hydriodic, either being used.

	Iodine in 1 c.
According to weight of hydriodic ether	0·12152
Determined as silver iodide.....	0·12136
Determined by ferric chloride and thiosulphate.....	0·12137
Determined in presence of ten per cent. HBr and ten per cent. of HCl.....	0·12158

Where silver salts are examined, the hydracids are produ from them as in the manner described with bromine.

We have now concluded a summary of these easy and eleg new methods of estimating the haloids, and for photograp purposes it is difficult to imagine a more sensitive and bea ful series of methods.

IMITATION CERAMIC PHOTOGRAPHS.

When one looks back at some of the processes of photograp and modifications thereof, that have at various times b introduced, one cannot be but surprised that many of th have not been turned to a practical account in every-day wo Sometimes, however, some of these old inventions and pliances are reinvented, patented, and exploited as be original. The particu process we have in our mind is that in years past we have directed attention to, and it is that was, we know, successfully worked, commercially, on Continent; but full advantage was not taken of it except what might be termed advertising purposes. It is, howev quite as well adapted for photographs of every descripti and, at the time referred to, we produced some very excelle results in portraiture that were mistaken for veritable burnt ceramic pictures, and for actual permanence they are in way inferior. If they are properly produced, the surface quite as hard as some of the soft glazes used for ename Furthermore, they are not liable to exfoliate, as some of t soft enamels are liable to do.

Some ten or a dozen years ago, the process formed the s ject of a patent in this country; but, if we remember rightly, was not carried beyond the preliminary stage. Anyhow, the are not any patent restrictions with regard to the process the present time. In a word, the picture is one on porcelai or other vitreous ware, and japanned; that is, its surfac when finished is as hard and durable as a good old-fashione japanned tea tray, for example. As the images are produce by the carbon process, it goes without saying that they may in any colour that may be desired.

The process is carried out in the following manner— carbon print is produced, preferably by the single transfe method on the ware, which may be a porcelain plaque, a glas or metal plate, indeed upon any impervious material upo which a carbon print can be developed, and which will als withstand a considerable degree of heat. So far as the pr duction of the carbon image is concerned, there is nothin different from the ordinary method of procedure; it is afte this part of the work is completed that the novel portion o the process comes in. We will here digress for a moment t

xplain, tersely, what is known as japanning. This consists of oating the surface with a suitable varnish, in repeated thin ayers, and then subjecting it for a time to a tolerably high emperature. The varnishes generally used for this class of vork are amber and copal. The former yields, perhaps, the iarder film; but the latter, if good, is little, if anything, inerior, while it is whiter, a consideration for our present purpose. t may be mentioned that it is not all amber or copal varnishes hat are suitable for japanning. Those that must be used are vhat are specially prepared for "stoving." The varnish we iave used very successfully was purchased under the name of white dial varnish." It gave a colourless film, and was exeedingly hard and bright when the picture was finished.

Mention was just made as to the varnish being applied in succssive thin coatings. They are put on with with a camel's-iair brush, but a fresh coating must not be applied until the previous one is thoroughly dry and hard, this condition being iastened by a moderate heat. If any brush marks are apparent, they may be disregarded, as they will disappear in the inal stoving or in the after-operation of polishing. After the vork has been stoved, that is, kept at a temperature of from 150° to 200° Fahr. for some hours, it is allowed to cool. The surface is then polished, first with pumice powder, then with ripoli and oil, and finally with putty powder, as lenses are polished. It will now be seen that the surface will possess an exceedingly high polish, and, if amber be the varnish used, it will be as hard and durable as the amber used for the mouthpieces of cigar-holders and the like.

Here is the way we proceeded. The carbon print was developed on an opal plaque and allowed to dry. A thin coating of the white dial varnish was then laid on with a flat camel's-hair brush. It may be mentioned that the varnish used for this coating was thinned with about an equal bulk of turpentine. Successive coatings were then applied, and finally the picture was stoved and polished as just described. The source of heat for the stoving in our experiments was the oven of the domestic kitchener, and it answered the purpose well, as the heat was perfectly under control.

In making pictures by this method it may be advisable to employ a tissue that contains a maximum of pigment and a minimum of gelatine, so that the film bearing the image is of a somewhat porous nature. The first coating of the varnish will then permeate it, and so bind it more firmly to the ceramic base. It is needless to mention that the pictures can be coloured, if desired, before they are japanned.

RECOVERING OVER-PRINTED PROOFS.

The trouble of over-printed proofs is one that is always with us, and the question of their recovery is constantly recurring; but at this period of the year, when the sunshine is, or ought to be, most powerful, the difficulty of avoiding over-printing is naturally greater than during the duller months, and is still further increased by the extremely rapid papers now in general use. In fact, except in cases where the whole attention is given for the time being to the printing frames, it is practically impossible to escape the loss of a not inconsiderable proportion of the proofs.

The subject of the recovery of such proofs has been frequently dealt with in these columns, but it may be safely asserted that no really satisfactory plan has so far been put forward. In the old days of albumen paper, although there were many ways in which a print that was too dark could be brought down to a reasonable depth, yet it was recognised that in almost every case it was at the expense of the colour of the image, and this is still to a great extent equally true, at least, of all the methods based upon the after-treatment of the toned picture. This is perhaps not greatly to be wondered at, if we consider that under such circumstances it is chiefly the silver portion of the image that is attacked, while the gold deposited in toning remains practically intact. We have to bear in mind that the material forming the image of an ordinary albumen or gelatino-chloride print is not a homogeneous substance, but a mixture of two metals in variable proportions, one of which gives a blue, the other a red colour to the picture, and consequently, if one or other be partially removed, the tone must necessarily suffer.

The case is altogether different when we have to deal with a developed image, whether it be a negative or a positive, as the deposit is, in that instance, of a homogeneous nature, and the image may be reduced without materially altering its colour, except so far as the mere change of density may affect it. In fact, developed positives may be reduced as easily and with as much certainty as negatives, and it is only when we turn to toned silver images that the difficulty is felt.

It may be asked if it is worth while going to the trouble of reducing an over-printed proof when it is so easy to print another one. Perhaps in one way it is not, while in other circumstances it may be desirable. Thus, in the case of a professional portrait photographer, it would be manifestly more convenient in every way to print two or three more copies of a portrait than to go to the trouble of reducing a few that happened to be over-printed. Even supposing the day's work included a sufficient number to make a special reducing operation worth the while, it is scarcely likely that the reduced copies would be uniform in colour with the rest, and uniformity is, above all things, a desirable property.

On the other hand, an amateur who produces a few occasional prints from a variety of negatives, under circumstances when absolute uniformity of colour is of no importance, may save up his over-printed proofs until a sufficient number have accumulated to make it worth his while to attempt their redemption. But even then, if albumenised paper be used, it would probably be the better plan, from an economical point of view, to treat the prints as "residues" and recover the silver they contain, though with gelatino-chloride the same argument does not hold good.

It is, in fact, in connexion solely with gelatino-chloride prints that we are at present concerned, for, although theoretically the same treatment will answer for albumen prints, yet in practice the conditions differ sufficiently to render it scarcely worth while to apply it to the latter circumstances. Indeed, it is only where ready-sensitised paper is habitually used that, for the reasons already given, the game would be worth the candle.

The following experiments were made mostly with intentionally over-printed gelatino-chloride paper, with a view of ascertaining whether it is possible to secure the satisfactory reduction of the image by proceeding upon different lines to those previously followed; and we may here say that some of the prints operated upon were apparently hopeless cases, and yet in some instances they were made to present really passable results.

As already explained, the treatment of the toned image appears to be altogether wrong in principle, so we turned our attention to the reduction or conversion of the darkened silver before toning. The first treatment was with a solution o

iodide of potassium to which sufficient tincture of iodine had been added to tint it a pale straw colour. Under the action of this solution the image was changed to a yellowish brown colour, not unlike that produced by hypo when applied to an untoned print, but with a stronger shade of yellow. It was at the same time slowly but uniformly reduced, until even apparently hopeless cases were brought down to proper strength and with perfect gradation.

Here, however, we may point out a weak point in this, and all other methods of reduction, at least as applied to gelatino-chloride, for it is the fault of the paper, and not of the method. This arises from the unevenness of the emulsion coating, which is very pronounced in some cases with the particular brand we were using, and which, though it may not show itself detrimentally when the printing is carried to a proper depth, inevitably does so in cases of over-printing and the uneven markings remain after the action of the reducing solution is complete. With this exception the reduction is effected with perfect uniformity.

After the iodide bath, the prints were thoroughly washed in many changes of water to completely remove all traces of soluble iodide, and were then passed into the toning bath; but, unfortunately, they refused to change colour to any appreciable extent, although several different baths were tried, and the strength increased to as much as a grain of gold to two ounces of water. It was no use, however; for, after some hours' immersion, the colour had only changed to a more hideous brown.

Remembering that iodide of silver was formerly supposed to exercise an evil effect on the tone of any picture in which it might be present, we substituted as the reducing agent a thirty-grain solution of bromide of potassium, which produced a somewhat similar change in the colour of the prints before toning, and behaved in nearly the same manner under the action of the gold. A strong solution of salt was next employed, and this, when allowed to act for a considerable time—about an hour—brought about the reduction of the prints with the same change of colour to yellow. In this case, after washing well, we succeeded without much trouble in toning the image to a reddish-brown or chocolate colour; but the details in the lights acquired the disagreeable pink tint known as double toning.

Now, as the colour of the prints after reduction with salt exactly resembled that of an Alpha print after development, or of a gelatino-chloride partly printed out and prepared for development, both of which images tone readily and easily enough, we resolved to vary the treatment in such a manner as to obtain a developed image having the same colour, in the hope that, under those circumstances, it would be more amenable to the action of toning.

As we have been led to expect, this proved to be the case, and we succeeded at last in securing a successful reduction of greatly over-printed proofs, together with tones that could not be distinguished from those obtained in the ordinary way. Whether, however, the advantage gained will be esteemed an adequate return for the trouble involved remains a question for our readers to answer when we give the details, which we hope to do next week.

Development of Solarised Plates.—Herr Kogelmann, of Draz, claims with "hydrogen thiosulphate (SO_2SH,OH, = hyposulphurous acid in aqueous solution)" to have succeeded in developing solarised images by transforming the non-developable silver haloid into a developable body.

Does Photography Lie?—The Hon. Slingsby Bethel writes: "Your article *re* Mrs. Fawcett and her babies reminded me how even professional photographers, for the sake, I presume, of gratifying the mothers, produce four-year-old infants in appearance out of two-year-olds. So long as they can rack out the camera, and focus with lens close up to the object, they care not for distortion and enlargements, producing what I term a Mellin's infant."

Stability of Bichloride of Mercury in Solution.—Mr. E. Burchier has been studying the stability of aqueous solutions of bichloride of mercury, made with ordinary and distilled water. He finds that in ordinary water the mercury salt immediately decomposes—air, light, the organic and other matter of the air and the water aiding the change. The decomposition, however, is arrested when the solution is withdrawn from the influence of air and light. In distilled water the decomposition is very slight, and is not accelerated by either light or air.

Colour Photographs by the Lippmann Method.—We are unaware of any English experimenters who have succeeded in confirming Lippmann and Lumière's colour results by the interference method, although we know such attempts have been made. Messrs. Lumière are, however, credited with getting improved results, which were shown a few weeks back at the meeting of the Société Française de Photographie. These consist of portraits and views, and the colours are said to be well rendered—better than those of the original results shown here last year. It is said that the exposures have been reduced to three or four minutes. This is a great advance on from one to four hours. In France this method has been successfully used by several experimenters in addition to Messrs. Lippmann and Lumière.

Professional *versus* Amateur in the Colonies.—Apparently the amateur *versus* professional question is a vexed one in the colonies, as we read that, under the heading of "Photographic Hawkers," some letters have lately appeared in one of the Tasmanian newspapers. A considerable amount of jealousy, it is said, exists in Hobart between the professional and amateur photographer, and, as a natural consequence, each side writes strongly in defence of its own view-point. One correspondent signing himself "Justice" suggests the advisability of increasing the revenue by taxing the amateur. He writes: "Seeing that the treasurer of the colony is looking about in all directions to raise additional revenue, I think the time has arrived when he might reasonably turn his attention to the amateur and itinerant photographers who make a practice of rushing here and there in the hope of picking up a stray job, thus debarring the professional photographer, who has to pay heavy rents and taxes, from securing same, which is an injustice, not only to the photographer, but to the hawker who has to pay a licence. Why should not this class be termed hawkers of photography, and pay the customary licence?" Another professional writes: "I respect the amateur as such, but I think that the pseudo-amateur and itinerant fraud should be made to contribute to the funds of the treasury by the payment of a licence, thus protecting the man who not only bears heavy expenses in carrying out his legitimate business, but who also helps to bear the taxation burden of the country he has a stake in." To these suggestions some lengthy replies have been sent by "amateurs," not of a complimentary character to the professional, who seems to be considered a species of inferior creature. Here is a sample: "*Re* amateurs selling their photos. So long as they do not undersell the professional, the latter should have no cause for complaint, for it would be ridiculous to believe that the profession is not able to turn out work of equal merit to that of the amateur. If, however, in fair competition, the public prefers the amateur's work on its merits, the professional should hide his diminished head and retire in disgrace." Another writes that "amateurs in mercantile houses, and more especially in the Civil

Service, just now cannot have very much to go and come on, and, if by selling a print or two they can better be enabled to pay 20*s.* in the £, I say let them sell."

A Novel Photographic Method of Solar Observation.—Dr. Deslandres made an important communication to the Paris Academy of Sciences on July 9. In December 1893, he suggested that separate photographs of the sun should be taken by means of the light of individual dark and bright lines in the solar spectrum. The success with which Prof. Hale has done this with the light of the K line shows that striking results may be expected from the development of the method. An ordinary photograph of the sun is mainly produced by the action, upon the sensitive plate, of the bright intervals between dark lines. Dr. Janssen's marvellous pictures of the sun are produced by using only light of high actinic power, and covering but a small region of the spectrum, to act upon his photographic plate. By carrying this principle still further, there can be no doubt that solar physics will be considerably advanced. The dark lines in the solar spectrum are only dark by contrast. Both Prof. Hale and Dr. Deslandres have shown that sun pictures can be produced by the light from them alone. Hence, by isolating a line due to any element, and using it to act upon a sensitive plate, a photograph is obtained of the layer of the sun in which that particular element predominates. Dr. Deslandres exhibited to the Paris Academy some of the photographs obtained in this way. His first results were produced by means of the light from the bright interval between two dark lines. The pictures thus obtained showed the photosphere with spots and faculæ much the same as Janssen's photographs. One point confirmed by the pictures is that the difference between the brightness of the solar disc and that of the spots and faculæ is more marked the greater the refrangibility of the light employed. The bright lines due to the vapour of calcium gave a different set of results. Such reversed lines do not represent incandescent solid or liquid, as in the preceding case, but are emitted by gaseous calcium at a higher level. Their light therefore imprints the image of the chromosphere upon the photographic plate. Dr. Deslandres' photographs of this kind agree with those previously mentioned as regards disposition and general forms of faculæ, but they differ in the fact that they show faculæ near the centre of the disc as clearly as faculæ near the edge, and also by greatly extending the areas of these bright patches. Using the light from a portion of the dark and wide calcium line, and exposing the photographic plate a little longer than when the bright reversal in the middle of the line was employed, a curious and altogether different result was obtained. The same faculæ appear upon the photograph, but they are not so clearly marked and are of less extent. On the other hand, spots are shown very distinctly, with their penumbræ sharply defined. Dr. Deslandres has obtained similar photographs by using absorption lines of iron, aluminium, and carbon, which are wide enough to permit them to be isolated by means of his spectrograph. The results of further work in this direction will be awaited with interest.

DUBLIN CONVENTION NOTES.—II.

(*By our Special Correspondent.*)

THERE are many very delightful places for outings with the camera in the vicinity of Dublin. First of all may be mentioned, as being within easy walk of the city, the noble Phœnix Park, with its adjoining People's Garden and Zoological Garden. The People's Garden has everything that can delight the eye. Here are to be found a pretty undulating lake with what appeared to be mimic islands, the banks shelving and steep in places, although not dangerously so even to children, and richly wooded throughout with many shady walks and seats. This, on a calm, bright day, ought to form a perfect paradise for a photographer, more especially if he had a stereoscopic camera, to which this portion of the garden lends itself most admirably. But, alas! I had left my hotel that day with only a 5×4 monocular. Still, I "bagged" several nice views, and left the place with a determination to return next day with my stereoscopic camera—an intention never carried into effect, rain, wind, and other business intervening to prevent its being done.

The Superintendent of the Zoological Garden is courteous, affable, and well informed, and the Convention badge ensured a ready acquiessence in a request preferred by myself and a companion that we be allowed to photograph within the place. A lake extends from end to end of the gardens, and there are many aquatic birds on it, some of them rare. A shaded walk extends along one side of the lake, along the other being artistically arranged the houses of the various animals, some of which are claimed to surpass in excellence and uniqueness anything of which London can boast the possession. The people of Dublin are quite proud of their Zoological Garden. An exposure of some half-dozen of films upon the scenery of the Garden has, I find, secured me an equal number of good negatives. I used my films in a roll-holder, which is a source of great comfort to a nomadic photographer. To do this with ease and certainty, one has only to adopt the very simple system of rolling on a fresh film immediately that an exposure has been made, and not consider the previous transaction complete until this has been done. The camera is thus always ready for next shot, and no fear of making a double exposure on one sheet need be apprehended.

The Phœnix Park itself does not offer many inducements for the photographer. It is very large, certainly, but one will walk in it a long distance without seeing anything worthy of directing a camera at. It was on the roadside in this Park, opposite the Viceregal Lodge, where Cavendish and Burke were stabbed eleven years ago. The exact spots where they stood when struck are indicated by spade-cut crosses on the footpath, and here are to be found congregated pedlars of bog oak and other national productions, chief among these people being a hard-visaged old dame who boasts of having been photographed oftener than any woman in Ireland. It goes without saying, both she and the others, including the spade-cut crosses on the side walk and road, were shot at by several photographers who were walking or driving out that way.

No photographer who visits Dublin should omit an eight-mile run by rail to the Hill of Howth, a promontory which forms one side of Dublin Bay. I formed one of a numerous party of Convention excursionists who visited it by a special train. Howth has a magnificent harbour; commands, from any elevation above sea-level, a fine series of views; has numerous residences, from the castle of the Earl of Howth down to the fisherman's cottage; contains remains of ancient religious grandeur; portions, especially in the vicinity of the Castle, are richly wooded, and it is nearly surrounded by beetling cliffs, one of which, two days before our visit, nearly proved the scene of a tragedy. A Liverpool gentleman, in endeavouring to reach a rare wild plant, missed his footing and fell over the precipice, but was caught some distance below by some projection. He lay insensible for many hours, but on recovery he managed to attract the attention of some passing boat, the occupants of which gave the alarm, ultimately leading to his being rescued. In course of their peregrinations the Convention party visited the scene under the guidance of Mr. Ruthven, who took good care that no such accident should happen to those under his charge. Howth Castle is a comparatively modern structure, and is approachable through gardens which are altogether unique, and in which one might readily lose his party if kept out of sight or hearing for two minutes. It was an act of great kindness that these private gardens had been thrown open by Lord Howth to the Convention. His sister, Lady Domville, and Miss Stokes received us all most courteously. It may be here said that this privilege is very rarely accorded to visitors. But it is of a piece with the treatment accorded to the Convention wherever they went.

After lunch, your correspondent fell a victim to the blandishments of one of the members—Mr. John Brier, of Macclesfield, who had come to Ireland in a fine yacht he had had built in Plymouth since last year's Convention in that town. He prevailed on me to return with him in his yacht in preference to going by train, just to see what she (vessels are always of the feminine gender) could do, you know. So away we went from the harbour where she had been

lying at anchor while Mr. Brier was on shore with his camera. Rounding Howth and the headlands, and accompanied by the waving of handkerchiefs from the party above the cliffs, we made straight for Kingstown, which we reached in due course, after the enjoyment of a truly pleasant sail and in time for a train which brought us to Dublin before the evening meeting had commenced.

PHOTO-MECHANICAL NOTES.

Intensification is a very important factor in the production of wet-plate negatives for the zinco processes, and it is safe to say that not a negative is produced for this purpose that does not undergo intensification. One is inclined at times to think that too much attention is given to this, and too little to the actual exposure and proper conditions of development; but where a maximum of black and white is required, as in the case of this kind of work, it is an absolute necessity to intensify in some way. The choice of formulæ for this purpose is somewhat limited; there are but three in actual vogue. English process operators, for the most part, favour the lead intensifier, American operators are more partial to the copper, whilst Continental workers seem to prefer mercury. As with all methods, use has a great deal to do with the success with which either formula is worked. Often it will be found that a man who has been accustomed to working with the lead intensifier will altogether fail with the mercury formula. But the fault is not altogether with the operator, for it is not to be contended that, with an equal exposure and an equal development, the same degree of opacity would be produced by each formula. Of the three methods of intensification, there can be no doubt that the nitrate-of-lead solution gives the most density, all other conditions being equal, and for copying line work there is nothing to equal it.

The lead formula in practical use is pretty much the same as the original one of Eder & Toth, given in most photographic handbooks, but the published formula very seldom includes the actual method of working, the precaution of washing with acidulated water after the bleaching being a noticeable omission. It is quite impracticable to use distilled water where a considerable amount of work is being done; and, in fact, it is not necessary if, to the hard tap water, either nitric or acetic acid is added to the extent of about one-fiftieth the bulk of the solution. It has also been recommended to add a little acetic acid to the lead solution, but, as I have never tried it in my own practice, I cannot say to what extent it will be beneficial. A point in practice that should not be overlooked is, that the process of intensification should not be carried out in a strong light, which will decompose the ferricyanide. Now, the use of ammonium sulphide for blackening renders it, if not necessary, at least advisable, to conduct the latter part of the operation near a window, or in the open air, and operators will therefore be generally inclined to do both parts of the work in the open; accordingly, the precaution I have mentioned is neglected.

The bromide of copper intensifier has often been published; but here, again, the way of using it is everything. A worker who has been accustomed to the lead will be quite disappointed with the first application of copper; but, if a second application of the copper and silver solutions is given, the negative will be brought nearer the mark. Probably the transparent portions may become muddy, but this can readily be remedied by again treating, but very lightly, the plate with the copper-bromide solution, much diluted, and then throwing over the plate a dilute solution of cyanide of potassium. The copper intensifier gives a much cleaner-looking negative than the lead, and it has the very desirable advantage of not necessitating the use of the "stinko," as the ammonium-sulphide solution is popularly termed.

Coming to the consideration of the mercury intensifier, I think its chief drawback is the inordinate amount of washing the plate requires, both after fixing and after bleaching, as compared with the two preceding methods, and the lack of good printing quality in the nd. It may be that apparently as much density might be attained by the mercury method as by any other, with suitable treatment, but I think that mercury never gives that spreading of the dots in half-tone negatives that is so essential a requirement.

Summing up the matter, it appears that, on the whole, the lead is the best for line work, and the copper for half-tone, whilst the mercury may best be left for dry-plate work, in which it has long enjoyed popular favour.

Leaving the matter of intensifiers, I turn to the equally important question of development. Here the choice of a formula is even more limited, for almost without exception the iron development is practised. For wet-plate work, so far as "process" is concerned "good old pyro" has been quite superseded. This may be due in some measure to the fact that the "process" printer likes to see a black negative, blackness being understood to typify the acme of negative density for printing purposes. This is somewhat of a fallacy, for a pyro-developed negative may have equally good printing qualities, even though it be not black. I once showed to a fellow-worker some negatives made with Brooks's collodion emulsion, which were splendid as regards clearness and density; but the first remark he made was, "Oh, but they are not black." This, I think, is one of the things which mislead a wet-plate worker when he tries his hand at dry plates; he aims at the blackness—the sooty blackness—of the collodion lead-intensified image, which can never be attained on a dry plate, and in fact is not necessary. All we want is printing density, and it matters not whether it is red, yellow, or black.

I am inclined to think that too little attention is paid to the claims of our old friend pyro as a developer for wet-plate process negatives. In the palmy days of wet plate, I have always understood it was the popular developer, and it was claimed for it that it gave more opacity than the iron, and, moreover, it gave a finer deposit. Now, this latter quality ought to be just the thing for half-tone negatives, as there is often a coarse granularity of deposit, not very marked to the naked eye, but very palpable when examined with a glass. The edges of the dots seem furred, and minute granules spread themselves over the shadows of the negatives. This result is especially marked with the lead intensifier, but is also visible before intensifying. I have seen many negatives of different firms betraying this fault, which has an effect on the print, especially if inking up is the after-process. My opinion is that it is due to iron development—it is certainly not present in pyro-developed negatives—but older wet-plate workers than myself may be able to give a better reason.

One other feature that will strike an ordinary wet-plate worker in regard to the making of process negatives is the slight use made of redevelopment. Possibly the extended use of the electric light has a good deal to do with it, exposures being timed to a nicety.

Finally, to those beginners who inquire whether the cyanide or hypo fixing bath is preferable, I can say that cyanide is the thing, with all its disagreeableness. The cyanide fixes quicker, is most easily washed out, and is not so liable to attack the film and make it split up on drying.

A good many of these facts may be elementary to a large proportion of my readers, but I am so frequently asked for advice on the matters I have dealt with, that there may be many who will find a useful hint herein.

Wm. Gamble.

DEVELOPMENT WITH THE ALKALINE CARBONATES.

Part I.

Noteworthy among other signs significant of the rapid progress which photography is nowadays making is the large amount of attention and painstaking investigation which is being devoted to the subject of developers and development. Organic chemistry, it is true, has done something to forward this movement by bringing a number of important chemical substances under the notice of practitioners of the art-science; but we can hardly doubt that in this case the demand has created the supply, and that to the photographer himself, rather than to the chemist, is due the credit of the widespread and intelligent interest which the subject of development is at present evoking.

While our developers multiply, and our developing formulæ increase, there is a growing necessity for fuller information as to the comparative qualities, merits, and defects of what we may be permitted to call our standard developers. I refer, of course, to those which have stood the test of time and with the working of which we are all familiar.

Strictly speaking, these are but two in number — alkaline pyrogallol and ferrous oxalate; but, if we include (as we are well entitled to do) their numerous modifications as distinct developers, the list may be considerably extended.

Of the modifications of the pyrogallol developer the most interesting and practically important are those in which one or other of the metallic carbonates of the alkaline series is employed as a substitute for the accelerator, ammonia. The carbonates available for use in the process of development are four in number, namely, sodium carbonate, potassium carbonate, ammonium carbonate, and lithium carbonate. It seems necessary that I should here say a few words as to the physical properties and chemical constitution of these salts, in order to prevent any misconception likely to arise at a subsequent stage through a seemingly loose choice of terminology.

Of the neutral sodium carbonate many varieties exist. There is,

first of all, the anhydrous salt, possessing the simple formula Na_2CO_3. Then we have this salt associated with a single molecule of water, Na_2CO_3,H_2O, and, at the other extreme of the hydrated series, a variety in which the proportion of water to carbonate is as fifteen to one, with the formula $Na_2CO_3,15H_2O$. The intermediate salts are unimportant, with the single exception of that which possesses the formula $Na_2CO_3,10H_2O$. This substance, which is the ordinary washing soda of commerce, occurs in large monoclinic crystals, which, by continued exposure to the air, part with a portion of their water of crystallisation and become white and opaque. As this salt is nearly always readily obtainable, it is for photographic purposes to be preferred to the anhydrous carbonate, and I have accordingly employed it in the series of experiments presently to be mentioned. In selecting samples of this salt for making up the developing solution, only perfectly transparent crystals should be chosen, and these, before weighing, should be gently wiped with a clean dry cloth, in order to remove any adhering moisture.

There are two varieties of the neutral carbonate of potassium, viz., the anhydrous salt and the hydrated. The former has the formula K_2CO_3; the latter, or crystalline variety, the formula $K_2CO_3.H_2O$. The anhydrous carbonate is the more suitable for purposes of development, and, accordingly, I wish to be understood as referring to that salt whenever I mention potassium carbonate in connexion with this subject. As this carbonate is a highly deliquescent substance, it must be preserved in a closely stoppered bottle, and, when required for use, it is advisable that it be first gently heated, so as to expel any traces of absorbed moisture.

Ammonium carbonate next claims our attention. The neutral carbonate $(NH_4)_2CO_3,H_2O$, is, unfortunately for photographers, a very unstable body. It parts with a portion of its ammonia with great readiness, and is thereby converted into ammonium bicarbonate, $(NH_4)HCO_3$. Besides the bicarbonate, there is a third carbonate, known as ammonium sesquicarbonate, which possesses the formula $(NH_4)_4H_2(CO_3)_3$. This is the ammonium carbonate of commerce known as *sal volatile*, a name applied alike to the crude salt (a mixture of sesquicarbonate and ammonium carbonate) and the pure or crystalline variety. Of these different salts the last mentioned is the only one under ordinary circumstances likely to be obtained of the photographic dealers. On this account I have thought it best to confine my attention to its properties and qualifications as a constituent of the developer. A very important fact in connexion with ammonium sesquicarbonate must not be overlooked. When this salt is dissolved in water, it undergoes decomposition, and a mixed solution of the neutral carbonate and the bicarbonate is obtained, in accordance with the equation—

$$(NH_4)_4H_2(CO_3)_3=(NH_4)_2CO_3+2NH_4HCO_3.$$

Doubtless it is to this circumstance that we find in certain textbooks on chemistry a perplexing, not to say misleading, statement to the effect that the sesquicarbonate is a mere mixture of the neutral carbonate and the bicarbonate, whereas, in reality, the separation does not take place until solution has been effected.

Lithium carbonate occurs in the form of a white powder of extreme lightness. It is but sparingly soluble in water. The metal being a member of the monad group, the formula of the carbonate is Li_2CO_3.

So much for the chemistry of the subject. I now proceed to say something as to the strength of the stock solutions required and the manner of their preparation.

Firstly, as to the sodium carbonate developer. I have carefully gathered together the various published formulæ for stock solutions of this salt, and, taking an average, I find sixteen grains of carbonate to one fluid ounce of water to be the nearest approximation to the mean strength. The amount of pyro in these formulæ may be said to vary from two to three grains per fluid ounce. According I have employed for experimental purposes a standard solution made by dissolving thirty-two grains of crystallised washing soda in two fluid ounces of water, and to this an addition of 4·5 grains of dry pyro was made immediately before commencing development. Sixteen grains per ounce is, then, the strength of our standard soda solution.

We must not, however, hastily conclude that this proportion ought to be observed in preparing the stock solutions of the three other alkaline carbonates. An important factor in the matter—namely, the varying chemical constitution of these salts—must be taken into consideration. As the result of chemical analysis it is found that, when 100 grains of crystallised washing soda are treated with excess of an acid, 15·38 grains of carbon dioxide are liberated. When 100 grains of anhydrous potassium carbonate are treated in the same way, the weight of gas liberated is 31·83 grains. An equal weight of neutral ammonium carbonate $(NH_4)_2CO_3H_2O$, is found to yield 38·59 grains of dioxide, and 100 grains of lithium carbonate, under the same treatment, will produce no less than 59·45 grains of the gas.

Now, these simple facts furnish us with all the data necessary to direct us in the preparation of stock solutions of a uniform strength.

The quantity of carbon dioxide expelled by acidification being taken as an index or guide, what we have to do is merely to arrange that each fluid ounce of any one of our standard solutions shall, when treated with excess of an acid, yield us always a constant weight of this gas. Thus, knowing as we do that 100 grains of the crystallised sodium carbonate will produce 15·38 grains of the dioxide, we divide by ten, and have as quotient 1·53 grain, the amount we shall obtain from ten grains of the carbonate. Then, because we have dissolved 32 grains of washing soda in two fluid ounces of water, and because $10\times3{\cdot}2=32$, therefore, $1{\cdot}53 \text{ grain} \times 3{\cdot}2 = 4{\cdot}89$ grains, one half of which is 2·44 grains, the amount of carbon dioxide that we shall obtain from one fluid ounce of our solution on treatment with an acid.

We must, then, in order to make up our remaining standard solutions, dissolve in each fluid ounce of water such a weight of the particular carbonate we happen to be employing as will produce, as nearly as possible, this constant equivalent of carbon dioxide, weighing 2·44 grains.

Let us, then, take, firstly, the case of anhydrous potassium carbonate. Weight for weight, it is much richer in carbon dioxide than is the hydrated sodium salt, 100 grains, as has been already mentioned, yielding no less than 31·83 grains of this gas. One tenth of that weight of the salt will accordingly give us 3·18 grains, which figure being multiplied by 3·2 we have as the product 10·17 grains, which is, of course, the amount of dioxide that we shall obtain from 32 grains of the carbonate, and, halving this, we have, in round numbers, 5·08 grains for each fluid ounce of solution. But we wish each fluid ounce to yield us the constant equivalent of 2·44 grains of dioxide, neither more nor less.

We therefore arrange our figures in the form of a sum in simple proportion, thus:—

$$5{\cdot}08 : 2{\cdot}44 :: 16 : x.$$

Here x, our unknown quantity, is the weight of anhydrous potassium carbonate which we shall require to make up a single fluid ounce of developer, and on calculation we find this to be equivalent to 7·68 grains.

Passing to lithium carbonate, we divide as before, the weight of dioxide contained in 100 grains of the salt—*i.e.*, 59·45 grains by the number ten. This gives us 5·94 grains for each 10 grains of the carbonate, and, multiplying again by 3·2, we have 19·00 grains for the amount of carbon dioxide existing in chemical combination in 32 grains of the salt. After halving this quantity, we arrange a second sum in proportion, thus:—

$$9{\cdot}50 : 2{\cdot}44 :: 16 : x.$$

The value of x in the present case we find to be very nearly 4·11 grains. This, then, is the weight of lithium carbonate that must be dissolved in each fluid ounce of water, in order to make up our standard developer.

So far, then, these preliminaries have been remarkable for their simplicity. But now, for the first time, a difficulty arises, a difficulty with regard to the question of the strength of the ammonium carbonate solution.

In the first place, though our calculations have reference to the neutral ammonium carbonate, the sesquicarbonate is the salt which we are actually about to employ for developing purposes. Here, therefore, there is a certain opposition between theory and practice, which constitutes our first difficulty.

In the second place, we have to remember that the sesquicarbonate when treated with water is resolved into a mixture of the neutral carbonate and the bicarbonate. However, neglecting these difficulties for the present, let us proceed with our calculation just as we would were the neutral carbonate really available for our purpose. In 100 grains of this salt we have 38·59 grains of combined carbon dioxide, and, consequently, from ten grains we shall obtain 3·85 grains. Multiplying the latter amount by 3·2, we have 12·32 grains for the weight of this gas liberated on treating 32 grains of the neutral carbonate with an acid. Halving this amount for the quantity contained in 16 grains, we have

$$6{\cdot}16 : 2{\cdot}44 :: 16 : x,$$

and, for the value of x itself, 6·33 grains. According to theory, then,

each fluid ounce of our standard developer should contain 6·33 grains of neutral ammonium carbonate.

Now, there are at least two ways in which, though employing the sesquicarbonate, we may prepare a solution in which the neutral salt is present in the proportion just now mentioned. Our first plan is to treat the sesquicarbonate with a strong solution of ammonia, thereby converting it into the neutral ammonium carbonate. At first sight this expedient would seem to leave nothing to be desired; but in practice I find it faulty, because of the difficulty experienced in ascertaining the exact stage at which the proper amount of ammonia has been added. I have, therefore, thought it best to add a slight excess of the alkali. Each fluid ounce of the standard solution I have employed in my experiments has accordingly contained 4·4 grains of ammonium sesquicarbonate, 3·8 minims of ammonia (·880 specific gravity), and 2·25 grains of pyro. This, in order to facilitate future reference, I shall call Solution A. The other, and preferable plan for preparing our stock solution is to avail ourselves of the important reaction whereby the sesquicarbonate is converted into neutral carbonate and bicarbonate. Taking the respective molecular weights of the sesquicarbonate and the neutral carbonate, we find that 254 grains of the former salt will produce, on decomposition, ninety-six grains of the latter.

We can now make our calculation, which, as before, assumes the form of a sum in simple proportion:—

$$96 : 6{\cdot}33 :: 254 : x.$$

This time, however, x is the weight of ammonium sesquicarbonate which we must dissolve in each fluid ounce of water to produce 6·33 grains of *neutral ammonium carbonate*, and, on making the calculation, we find the requisite amount to be 16·74 grains. An alkaline developer prepared in accordance with this formula I shall allude to under the name of Solution B.

It will be noted that I have said nothing as to the possible influence of the bicarbonate of ammonia upon the development. As yet, I am unable to say whether this salt possesses developing properties of an activity sufficient to render it a fit substitute for the neutral carbonate. So far as my experiments have gone, I am inclined to think that it does exercise a slight but distinctly perceptible influence on the process of development. Making allowance for this influence, I have made use of a third solution of the sesquicarbonate rather weaker than that last referred to. To each fluid ounce of water I allow 12·5 grains of ammonium sesquicarbonate, and 2·25 grains of pyro. This I call Solution C.

It must be borne in mind that our solutions are made up, once for all, of the exact strength that we intend to maintain during the process of development, and that, consequently, we are not permitted to dilute them by the addition of a further quantity of water. In practice, therefore, it is necessary that we should add to each fluid ounce of stock solution in the developing dish 2·25 grains of dry pyro. Those who object to taking this course may adopt the alternative of employing two solutions, the one of carbonate and the other of pyro, in which case the former volume of water must be halved for each. In the case of lithium carbonate, however, it is impossible to resort to this expedient, as, on account of the slight solubility of this salt, the full quantity of water is required in order to effect complete solution.

This, then, is all that I intend to say on the subject of standard developers. It will be seen that, in the formulæ which I have given for their preparation, I have founded my practice almost wholly upon the broad basis of chemical constitution. Though this is not the course ordinarily adopted, I am convinced that it is the correct one; certainly it is that proper to be pursued by the photographer who proposes to himself the task of instituting a comparison between the qualities of the different developers. In my next paper I shall have something to say as to the manner in which we must set about this work of comparative examination. Therein I shall consider my general subject under three distinct heads, speaking in the first place of experiment; in the second, of the results obtained by experiment, and, in the third, of the classification of the results so obtained.

MATTHEW WILSON.

NOTES ON FOCUSSING.

THE ability to focus properly is not possessed by very many who follow photography either as a business or a pleasure. The conclusion that every one who can photograph must be able to focus is altogether misleading, its apparent simplicity, as one of the elementary scraps of knowledge that a beginner must of necessity know, is wide of the mark. Focussing as a fine art, so to say, is quite different to merely getting the image to be sharp on the focussing screen, which any one with ordinary eyesight and good instruments can do in a few minutes. The artistic feeling in the picture greatly depends on the judgment and skill shown in focussing. A photograph equally sharp all over, unless a reproduction of some kind, is really not well focussed. It is somewhat remarkable that a picture may be considerably out of focus in parts and yet give the impression of being perfectly sharp, and it is only by close examination that equal definition is found to be *not* one of its qualities. The want of sharpness adds a charm, instead of producing a defect, for the simple reason, the less sharp portions fall in the *right places*.

If we observe nature, we find the more distant the object, the less defined it is, the definition depending entirely on atmospheric conditions; in this country the variations of dryness and moisture are exceedingly useful in preventing monotony in our landscape pictures, and it is only on rare occasions that the distance appears hard and sharp, as it frequently will do in the elevated mountainous regions of the Continent, where an object will appear as well defined at as many miles as it will here at as many yards. We may accept it as a general rule that, whatever other portion of the picture is not well defined, the foreground must invariably be so, if it plays an any way noticeable part in the composition. Sometimes it happens that, when photographing from an elevated standpoint, there may occur some small piece of rock or tree, close to the camera, impossible to altogether avoid. In this case, we are justified in ignoring it, as far as the focussing goes, as, in all probability, to get it well defined on the focussing screen would be to the damage of all the rest part of the subject; a sudden drop in the ground might make the next object in the picture some considerable distance removed from the foreground, and to get all in focus would necessitate the use of a very small stop, which is best avoided if possible, as the larger the aperture, consistent with definition, will produce a better quality of photograph than when the lens is much stopped down; but, if the foreground *gradually* merges into the distance, it is necessary to make the foreground quite sharp, as the conditions then are altered, and we cannot afford to neglect definition in the near foreground, however insignificant it may be. With many of our modern lenses everything on the plate may be well defined, from foreground to distance, with a moderately sized stop; but, having the power, it is sometimes advisable not to use it, although I am no advocate for the fuzzytype style of picture when everything is more or less badly defined, but that some parts should be more distinctly made out than others are, I believe, as it should be and conforms to the requirements of both nature and art. It is impossible to lay down any definite rule as to what parts shall be more or less out of focus, as the subject itself determines this.

We may fairly infer that it will be best for the most important objects in the picture to be best defined. Supposing we are about to photograph an avenue of trees. We select the most available picturesquely grown tree for our foreground. Its claims may be due either to its form or the lighting; but, whatever it is, it is imperative that it is perfectly defined, and, if the trees beyond it are a trifle less sharp, we get a better result than if all were equal in this respect. By reversing this method, and rendering the more distant foliage sharper than the foreground, we achieve a most disappointing result; the whole of the foliage, looked at as a whole, will *seem* to be deficient in sharpness, the leading lines in the foreground trees dominating the rest. In the first instance, the near portions of foliage being well defined, the eye takes it for granted the more distant ones are sharp also; their want of it rather acts as a foil to the nearer ones, and improves their apparent definition. Skilled focussing will always lead impressions in the direction intended by the photographer, whereas, when it is improperly managed, those portions are emphasised that ought to be left in a subordinate relationship to the rest of the composition. The late Mr. Francis Bedford was particularly skilful in the matter of focussing, and many of his best pictures were not sharp all over, but well defined on every point where definition was artistically required. In portraiture, if the orthodox portrait lens is used, very much depends on judicious focussing. The roundness of the field precludes any great depth of definition, necessitating the most salient points of the face being focussed upon. Now, often lenses with flatter fields and greater depth of definition are used, which somewhat reduces the difficulty, but does not altogether do away with it. The nearness of all the subjects to the camera in such cases introduces a difficulty not usually met with in landscape work, and, having to work for the sake of rapidity with a large stop, a very careful adjustment of the focus is required. Thousands of photographs are spoilt by injudicious focussing, and in this connexion I think much less importance is given to the image, as a whole, on the

focussing screen than it deserves. We have become so used to see the image upside down, that, if we think at all about it, we accept it as a necessary and unimportant matter. My opinion is, that it is neither one nor the other, but, on the contrary, a very great drawback to satisfactory picture-making, whether portraiture or landscape. The immense feeling of relief when we see a picture right way up ought to impress us that we voluntarily handicap ourselves by submitting to the topsy-turvy method. Take a finished print, and examine it wrong way up. How much satisfaction do we get, or how could we fairly criticise it? Yet year after year we adopt the unmitigated nuisance of inverted images, and fatuously twist our necks, in order to see them as much as possible right way up.

Surely some neat arrangement of focussing could be devised in order to attain this end. If we examine anything else but a camera image in an abnormal position, we at once experience the sensation of not seeing it properly; in fact, objects assume an unfamiliar aspect, and, however used we get to the upside-down focussing, there is not a shadow of doubt but that we should do infinitely better if we saw the image right side up, besides experiencing a sense of comfort to which we are now strangers. If it was merely definition we wished to ascertain, it would not matter in what way the image was presented to us; but, when composition and arrangement demand our attention, it would be as well not to place a serious impediment in the way of doing it properly, as we have done ever since photography was invented, and up to the present time there seems very little inclination to make any change.

The first thing a beginner has to learn is how to focus, and this I believe to be generally looked upon as synonymous with getting the image sharp on the ground-glass screen, and there it ends, or is supposed to; but in reality this is only a preliminary matter, as the real focussing is putting in practice the knowledge of the artistic values of objects as the component parts of a picture. No amount of written directions will be of much use, as this matter depends entirely on art knowledge and culture, the only safe guides in making a photograph a picture.

The following remarks may be some little guide in reducing focussing to something of a system, although every picture taken requires some modification peculiar to itself. We begin by carefully observing the subject we propose to photograph, noting the most conspicuous, or those objects which we desire to form the most attractive parts of the composition, and then mentally reduce it to the form of a picture, imagining how it will appear as a flat surface. The concave lens is useful in giving assistance at this point, especially if it is masked down to the shape and proportion of the picture we intend to make. Now look on the ground glass, and note the effect, which will be somewhat different to that given by the concave finder, increase of size altering the apparent value of the different portions to each other. Be in no hurry, but thoroughly well consider the image in all its bearings, altering the focus to and fro until the best effect is obtained according to our preconceived ideal.

This proceeding will occupy some time, but it is not by any means thrown away. Conscientious workers, who really know what constitutes a good picture, and how to make one, frequently spend most of their time, when out photographing, in focussing, or, in other words, composing their pictures, for composition and focussing are part and parcel of the same operation; either badly performed will vitiate the whole. A general rule in landscape work may be given, that the nearer the object to the camera the sharper it should be, and in portraiture the eyes of the model should be the best defined part. Nose, mouth, and ear follow closely after in importance. Old portrait lenses having so little depth of definition, it is necessary to focus very carefully on those points required absolutely sharp. Lenses of the rectilinear type are much more easy to work with, on account of their greater depth of focus, and the probability is, if the eye was focussed sharpely, all the rest of the head would be sharply defined too. For groups this quality is valuable, but for single figures a good portrait combination generally gives the most artistic result.

Atmosphere is not dependent on focussing, although a semblance of it may be introduced by want of definition, but *it is* upon exposure. A properly exposed and developed picture will always possess proper aerial perspective, and there will be no necessity, by intentional want of sharpness, to imitate it.

EDWARD DUNMORE.

PHOTOGRAPHIC CLUB.—The Bank Holiday Outing will be to Otford and Eynesford, under the leadership of Mr. Bedding. Trains at fifteen minutes past eleven from Victoria (London, Chatham, & Dover Railway), ten minutes past eleven from Holborn Viaduct, connecting at Herne Hill. Book for Otford: fare 3*s.* return, third class.

THE TRANSFERENCE AND ENLARGEMENT OF GELATINE FILMS.

PHOTOGRAPHERS generally, and hand-camerists in particular, will always take an interest in a subject of this nature.

Few of us, I suppose, but have had a broken negative, and made an attempt to remove the film and replace it on a fresh support, while the need on occasions for the reversal of a film has somewhat curtailed the use of single carbon as a charming and permanent printing process.

In fact, only recently has any great advance been made in this direction, mainly by the introduction of a fluid for enlarging purposes, and it is only fair to say that numbers, including myself, have used this with the average amount of success. For my own part, I should have used it oftener but for a partiality for pyro developers, a predilection not shared by the fluid referred to.

Being wishful recently to clean off some faulty negatives, the glasses were put into a rather strong acid bath. The facility with which the films were removed astonished me, but more noticeable still, considering the strength of the bath, was the toughness of the disengaged film and the small *apparent* loss of density. The idea naturally followed that a gelatine film could be treated with a much stronger acid solution than that ordinarily used for stripping purposes, and, on the whole, it seemed reasonable to suppose that a period of one minute in a twelve per cent. solution of hydrochloric acid would do less harm than half an hour in a weak bath.

Various negatives have since been treated, all with most promising results. Certain rules being necessary to follow, if success was to be complete, I had a notion that plates developed with metol, amidol, or hydroquinone were easier, *much easier*, to strip than those developed with pyro. I now find no perceptible difference in this respect. In a solution made up of one part of common spirits of salts to seven of water, the film will commence to leave the glass in one minute. In two minutes it may be peeled off, and removed to clean washing water.

In this washing water the increase in size is remarkable. A half-plate film will "open out" to $6\frac{3}{4} \times 9\frac{7}{8}$ inches. This is, of course, a drawback in many cases; so also is the obvious fact that the density spread originally over $6\frac{1}{2} \times 4\frac{3}{4}$ now has to do duty for nearly 10×8; hence a much over-dense negative must be selected to operate upon, or we must resort to intensification.

Intensification may be carried out as a final operation, but, if necessary, is better, more safely, and more quickly done while the film is in the detached state. When it leaves the acid bath, and has received a wash or rinse in the washing water, and has completely and *evenly* enlarged, the film is in the best possible condition for the mercury bath. After bleaching, it is removed to fresh water, and, after soaking and two or three changes of water, may be treated with ammonia, as usual, to complete this part of the business. In the mercury bath the film shrivels up to its original size, then opens out again until, when in the ammonia and final washing bath, it is apparently as large as before.

After the ammonia, the film may be dropped into the *first* washing water (this will be found to be *slightly* acid), and attached, without further delay, to its final support, being reversed or not, as may be required.

A film which has been treated at this stage with mercury is not enlarged to the extent attained by one *not* so intensified. A plate $4\frac{1}{4} \times 3\frac{1}{4}$, intensified *in medias res*, reaches $4\frac{3}{4} \times 3\frac{3}{4}$. A similar plate, unintensified, extends to $5\frac{1}{2} \times 4\frac{1}{4}$.

I do not care to intensify *after* the film has been transferred and dried. Reticulation will sometime intervene, and the film will leave the glass, or pucker up in an alarming way. This is not fatal, however, as, if the film will come off complete, it can be, after treatment, transferred to a fresh glass. This is, however, troublesome, and a waste of time. It seems to be a much more rational plan to put on the density at a time when the film is so well in hand, and when a decreased amount of washing will suffice to remove the superfluous mercury. While in the film state, for obvious reasons, the washing is not a serious matter at all.

The final glass (or celluloid) support has to be considered. Merely a cleaned glass plate will not do. I *have* succeeded, but often the film will crack or split in drying. A substratum is required, and this may be gelatine or collodion, or, what is, I think, the best of all, *rubber*.

The rubber solution sold at cycle depots for the repair of pneumatic tyres answers the purpose.

One drachm by weight is taken of this, put into a bottle with two ounces of rectified benzine, and shaken till dissolved. The solution is cloudy, and, when poured on the cleaned plate and drained off,

may still be cloudy; but, on drying, the thin layer will be found quite clear, or may be very slightly matt.

The *modus operandi* is as follows, taking a half-plate as a guide:—In a dish is placed the dry plate, unvarnished, of course. Pour on mixture of

Hydrochloric acid	½ ounce.
Water	3½ ounces.

In about one minute the *edges* of the plate may be gently rubbed with the finger all round in order to disengage the film. This done, starting at one corner and using two or three finger-tips, the film will come away evenly and readily.

A 12×10 deep dish is at hand, with clean water, and the disengaged film is carefully dropped therein. A few touches with the finger will be enough to make it open out, expansion then proceeding at a rapid rate.

If the negative has been trimmed or cut down, or the edges cut off, the film will come away *cleaner*. The partly exposed edge is of a similar nature to the safe edge, familiar to carbon workers, and is the initial difficulty. I know some people fail here, and get the film torn before the edges are disengaged.

It is not always possible to use a diamond or glass-cutter, besides being risky; but, by using a sharp penknife and a straight edge, the film may be neatly cut through at these parts before going into the acid. The waste edge is then peeled off, and thrown aside, and the remainder then comes off clean and tidy.

Unless the negative is very dense to start with, some more or less considerable loss of density is to be anticipated. An averagely dense negative will invariably want intensifying; therefore, the usual bath being ready, the film is dropped in, spread out as before, and carefully watched, the object being to get the bleaching done evenly, and to avoid overdoing it.

Fifteen minutes' washing, or rather soaking, in three or four changes of water will probably satisfy all requirements, at any rate in experimental trials, the film then being dropped into the ammonia bath, and very soon after into the washing water for its final bath.

By using the faintly acid washing water the film dries clean and free of any chalky deposit, any rubbing with the finger or wet wool being, of course, impossible.

The final transfer may now be made. A rubber-coated plate of requisite size is slipped into the bottom of the dish *face up*, the film gently arranged in position, and both withdrawn. The only objection to the pyro-developed film is that I notice it curls very much during the operations, and is therefore troublesome to get flat; those developed with metol are much more amenable to treatment, and are really very little trouble.

The film and glass, on removal from the bath, will be full of water; they cannot well be *drained*, but the superfluous water must be removed. The best way to do this is to put the glass face up on a flat surface covered with a blotting-pad, carefully lay down on the film a soft linen cloth, slightly damp and free from folds, and then go over it gently and steadily with a *roller* squeegee. This ensures contact, and the removal of any air bubbles. This will be better than any vain attempts with a camel's-hair brush to press out air bells. The more water there is under the film the better, as it can all be rolled out together, avoiding thereby any *uneven* sticking of the film to the support. After a short interval the plates may be put on end to dry.

Varnishing is desirable, a good, hard, white varnish being used, and a touch of black varnish round the edges gives a business-like finish.

It is only fair to say that, in spite of a run of successes, an occasional failure may occur in order probably to prevent one becoming too cock-sure! Some films are wonderfully tenacious. If the *edges* come away readily, we may safely infer that the film is detachable; but, if this is not the case, it is better to at once desist from the attempt and rinse and dry the negative. The film may be tenacious, and it may be positively rotten. Again, too, there must be a fairly well-distributed deposit of silver in the film, a negative full of gradation and rather dense is more likely to be a success than one thin and weak, with patches of bare gelatine; the denser parts will come away readily, but the thin parts are naturally weak and will bear little or no handling. It also occasionally happens that a film is almost off the plate, with perhaps one or two small spots only in the way of complete detachment; the use of a camel's-hair brush is suggested here; no time must be lost and no actual force used. Pour off the acid, apply water, then a little effort with the brush, aided by the natural expansion of the film, will suffice to perfect the operation.

It is worth remarking that some portrait negatives which have been *retouched* have been enlarged in this way, and, intensified, are not only quite a success, but the retouching remains, so far as I can see, perfect.

A solution of hydro*fluoric* acid in water five per cent. will no doubt be preferred by some workers. It is noticeable that the expansion is not so great as with hydrochloric acid, being with a plate 5 × 4, practically half an inch less all round. Its use also is objectionable on account of its action on the skin. I can work with the hydrochloric acid and water without discomfort, but the fluoric very soon makes my finger-tips painful. It is, moreover, rather difficult to procure in many places; looking at it, therefore, from various points, I prefer to use hydrochloric acid.

The uses of a simple method of enlarging without camera are easily seen. One only need be mentioned. I wanted to copy recently a *carte-de-visite* to whole-plate size, and could only succeed in getting, with my present outfit, a respectable cabinet. The negative has passed through the above procedure, and now shows up as an imperial. The enlargement of a small negative by easy stages to quite a respectable size is, therefore, possible without intervention of lens or camera. Negative, transfer, transparency; negative, transfer, and transparency, *ad infinitum*.

I feel there is nothing very original about all this, but I have reason to believe that many workers do not succeed very well in getting good and satisfactory transfers, and many more are under the impression that the removal of the film is a very difficult and hazardous business. On the contrary, the film will stand, if not broken, a fair amount of handling without fear of damage—*careful* handling, of course; the clumsy operator had better leave it alone.

It only remains to be said that the original negative surface should be quite intact, free from holes or scratches, unvarnished, and, by preference, not previously intensified.

A word or two may be said on the degree of amplification under different conditions, which will form some little guide as to the size of plates likely to be required for the films.

A whole-plate negative, developed with pyro and sulphite, measures, when stripped and in washing water, 10×8; intensified and remounted, ultimately reaches to 9½×7½. This particular negative, had it been a shade denser, would have required no intensification, and would thus have yielded a negative practically 10×8. The finished negative is, if anything, a little overdone. The pyro-developed film does not expand to the same extent as one developed with metol, nor, and of course naturally, does it lose so much density.

A 5×4 snap-shot negative, developed with *metol* and stripped, measures in the washing water 7×5½; but, intensified, can be mounted on a glass measuring 6½×5¼.

The reversing of a film is almost too easy a matter; in fact, one has to be careful, or we shall reverse without intending to do so. Portraits particularly are deceptive. Architectural subjects are somewhat troublesome. We may in the tranfer correct a negative in which the vertical lines are somewhat faulty; but, on the other hand, we may easily go too far, and with the result of giving an intoxicated aspect to a fluted column by no means pleasing to the eye. On the whole, so naturally will the film, with a little mechanical assistance, adjust itself, that, having provided a sufficiently large surface, too much interference should be avoided. The glass support should always be rather larger all round than the film.

No doubt some deftness and confidence are required for work of this kind; easily acquired, however, if the operator will take in hand some half dozen or so spare negatives. It does not take long to find out that some films are tougher and thicker apparently than others, even of the same maker (my own trials have all been with Ilford white label plates. These have a wonderfully good film and body. One negative only, the whole-plate referred to, and taken some years ago, may be a Paget); but, as soon as confidence is gained, they may all be manipulated with great facility. J. Pike.

Our Editorial Table.

Die Messerfolge in der Photographie.

By H. Muller. Halle a. S.: Wilhelm Knapp.

Issued in two parts, and forming Vols. VIII. and IX. of Herr Knapp's Encyclopædia of Photography, these handy books deal briefly with the errors of development, printing, and other photographic operations, and suggest remedies.

Die Stereoskopie und das Stereoskop.

By Dr. F. Stolze. Halle a. S.: Wilhelm Knapp.

Dr. Stolze's work, which has thirty-five illustrations, is a tolerably complete survey of stereoscopic theory and practice. It is ably and clearly written, and, as stereoscopic work is increasing in popularity on the Continent, no doubt it will be welcome.

Die Isolirung der Substanz des Latenten Photographischen Bildes.

By Franz Kogelmann. Graz: The Author.

This is a short treatise in which the author discusses the various theories concerning the formation and composition of the latent photographic image, and describes some experiments.

Handbuch der Photographie: Vol. II., Das Licht in Dienste der Photographie.

By Dr. H. W. Vogel. Berlin: Robert Oppenheim.

In this, the second volume of his Handbook, Dr. Vogel treats of light, subdividing his subject into photometry, sensitometry, actinometry; solar and artificial light; the various phenomena of light, including halation; the spectrum and its photographic effects; colour sensitiveness; spectroscopy: "natural-colour" photography; and photographic lenses. The author examines and summarises all that has been done in these directions, and the result is an exhaustive and painstaking compilation. Undoubtedly, when complete, the Handbook will be a grand work, to which, alas! we do not seem likely to have a parallel in English.

From Messrs. Gauthier Villars et Fils, Paris, we have received *Sepia Photo et Sanguine-Photo*, by A. Rouillé-Ladevèze. In this the author describes how, by the incorporation of various pigments with bichromated gum or powders, coating suitable paper, drying, exposure and development as in the original carbon process, positives in a variety of colours can be obtained. The same publishers also send us *La Photographie en Montagne*, by Eug. Trutat, in which the author fully but clearly treats of the essentials to success when photographing in hilly or mountainous districts. It should be useful to Alpine photographers and others.

Formulaire Aide-memoire de Photographie.

By G. H. Niewenglowski. Paris: Société d'Editions Scientifiques.

This is a *brochure* of some eighty pages, containing tables of solubilities, standard sizes of plates, and cards; equivalence and reactions of chemicals, properties of developers, and much other information likely to serve photographers.

From Mr. G. Nordenskiöld, of Stockholm, we have received *Undersökning af Snökristaller*, which is devoted to the photography of snow crystals, a number of excellent reproductions of many beautiful crystallisations being given.

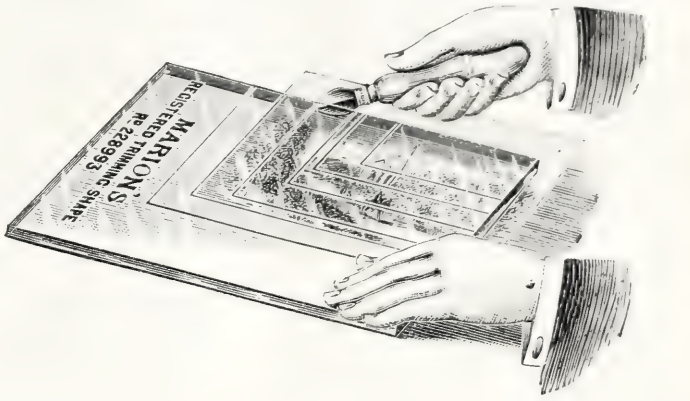
Marion & Co.'s Seasonable Novelties.—Chromophotophane.

This is a process of colouring photographs with great ease and a singular amount of effectiveness.

Every one is aware of the principle of rendering prints transparent, or at any rate translucent, and then painting them on the back, and doubtless some good results have been thereby obtained, but Messrs. Marion have gone one better, and have just placed upon the market a system analogous to, although differing from, what has been formerly achieved in this direction. M. Klary, who is undoubtedly a master in subjects related to the art department of photography, is the inventor and patentee of the system, and, as he must necessarily have an intimate acquaintance with all that has been previously done in this direction, novelty in the present invention must be assumed. The colours are applied at the back. They are transparent and liquid, and are twelve in number. They do not spread when applied, and a peculiarity in them consists in their rendering the paper so transparent wherever it is touched as to show each touch immediately on the face of the print, giving it the appearance of a water-colour drawing. Some examples shown to us were certainly very fine, so much so that we at once concluded that for to the professional photographer there was money in it if in these quiet times of business they would add this as an adjunct to their business, more especially as it involves only a comparatively trivial outlay, for a case containing a complete outfit, including brushes, palette, bottle of medium, all the colours, and book of instructions can be had for a couple of guineas.

Marion's Registered Trimming Shape.

This is a novel and, we may add, very handy method of trimming prints to any size. It consists of a stout square of glass having polished edges, and on one side the various sizes of prints deeply etched into the glass, the lines being then filled up with deep colouring matter, which has been burnt in. The method of using it (shown by the adjoining drawing) is quite simple. One edge of the print having been made square, it is covered by the "trimming



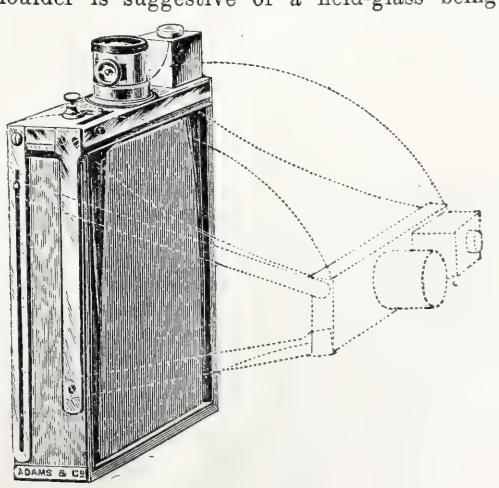
shape," and moved about so as to determine how much of the picture should be included. A sharp knife applied to the outstanding portion of the print, as shown above, does the rest. The shaping glass is made in three sizes, and answers for every dimension of print, from the promenade midget up to 14×11 inches. It is encased in a cloth-covered wallet. Pneumatic rubber holders, wheel trimmers, and single or double trimming knives are adjuncts to these trimming shapes.

The Four Generations.

Two groups from the camera of W. & D. Downey are being published by Marion & Co. One of them represents the infant Prince Edward of York, held in the arms of his great-grandmother (Her Majesty the Queen), with the infant's father and grandfather forming the other elements in this group of four generations. The companion picture shows the child, the mother, and the Princess of Wales, together with the Queen and the infant. These groups, which are issued at a low price (8*s*. per dozen, size $11\frac{1}{2} \times 7\frac{3}{4}$ inches), would form an attractive addition to the local attractions in the show cases of photographers. The various likenesses of the adults are excellent.

Adams & Co.'s Vesta Pocket Hand Camera.

The case in which this elegant camera (quarter-plate) is slung over the shoulder is suggestive of a field-glass being contained



therein. It may, however, be easily carried in the pocket. Specially designed for portability, as shown by the solid portion of the drawing, it can be instantaneously thrown open for use, as indicated by the dotted lines; the utmost rigidity being maintained throughout. It is fitted with a Wray five-and-half-inch rapid rectilinear lens on

the mount of which is engraved two scales, one for the iris diaphragm which ranges from *f*-8 to *f*-64, the other (actuated by rack and pinion) indicative of the distance of the object to be photographed, commencing at eight feet and going on to infinity—a fine piece of work, and quite accurate as to its gradation. The shutter is a triumph of pneumatic art, opening from and closing to the centre by an invention of Hill & Adams, and ranges in exposure from one second to the one-hundredth part of a second, although a time exposure may also be given. The finder can be turned to show either a horizontal or a vertical view. There are three very light dark slides in the construction of which both mahogony and ebonite are employed. There is also a magazine back containing a large number of films or plates. The ground glass is part and parcel of this unique camera, which taken all in all is one on which we cannot easily see where any further improvement can be made.

Knowledge through the Eye.

By Alfred P. Wire and G. Day.

This booklet, published at one shilling by George Philip & Son, 32, Fleet-street, treats of the lantern and its applications, and describes modern methods of making slides.

We have received from Mr. Walter D. Welford, 59, Chancery-lane, a set of hand-camera snap shots, taken during the Convention in Dublin. They very vividly recall several of the scenes there witnessed, and will, from their associations and intrinsic merit, be always prized by us.

News and Notes.

The Exhibition of the East London Photographic Society has been fixed for October 22 and 23 at the New Tabernacle, Old-street, E.C.

We are sorry to hear of the death, suddenly last week, at Horsham, of Mr. H. G. Cocking, photographer, son of the late Mr. Edwin Cocking.

Sir George Prescott, Bart., who was Chairman of the Committee of the Camera Club, died on Monday, July 30. He had for many years been an amateur photographer.

We are informed that the Committee of the Central Photographic Club are arranging for the holding of practical technical evenings during the winter months. They will be conducted by members who have undertaken the duty.

The Exhibition of the South London Photographic Society will be held during the week ending December 1, 1894, at the Public Baths, Church-street, Camberwell, S.E. Full information can be obtained from the Hon. Secretary, Mr. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Errata.—The Hon. Secretary of the Hackney Photographic Society writes: "Will you kindly correct the following errors, which appear in the report sent of Mr. Sodeau's paper on *Orthochromatising*, read before the Hackney Society?—Insert '*and red*' after 'orange' wherever it occurs. In the passage, 'staining—had no effect on the question of halation, that he had tried to get sensitiveness to orange by bathing commercial isochromatic plates in cyanine, solution without result,' for 'had no effect,' &c., substitute 'did not *necessarily* prevent halation,' and insert 'useful' before 'result.' In 'the effect of the dye was not obtained if the plates were used wet' insert 'full' before 'effect.' Addition of sodium and silver nitrate,' omit 'sodium and.'"

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,121.—"Apparatus for Changing Photographic Films." A. C. Smith and A. A. Smith.—*Dated July*, 1894.

No. 14,161.—"Improvements in or relating to Photographing in Colours." Complete specification. J. Joly.—*Dated July*, 1894.

No. 14,224.—"Improvements in the Process of and Apparatus for Making Photographic Negatives." B. McF. Clinedinst.—*Dated July*, 1894.

No. 14,229.—"Improvements in Photographic Apparatus." G. G. Hardy.—*Dated July*, 1894.

No. 14,277.—"An Improved Shutter for Photographic Cameras." Complete specification. D. Morgan.—*Dated July*, 1894.

No. 14,279.—"Improvements in the Means of Focussing in Optical Lanterns, Photographic Apparatus, or other Apparatus in which Telescopic Action is Employed." W. Lawson.—*Dated July*, 1894.

No. 14,281.—"Improved Focussing Appliance for Photographic Cameras." E. G. B. Barlow.—*Dated July*, 1894.

No. 14,376.—"Improvements in Photographic Printing Frames." C. A. McEvoy.—*Dated July*, 1894.

No. 14,446.—"An Improved Apparatus for Enlarging and Reducing from Photographic Negatives." C. S. Jones.—*Dated July*, 1894.

No. 14,460.—"An Improved Instrument for Surveying with the aid of Photography." J. B. Lee.—*Dated July*, 1894.

No. 14,525.—"Apparatus for Setting of Types and Signs by means of Photography." E. Porzsolt.—*Dated July*, 1894.

No. 14,472.—"Improvements in Hand Cameras for Photographic Purposes." S. C. Rudman.—*Dated July*, 1894.

No. 14,492.—"An Improvement in the Chamber or Reflector for carrying the Lamps used in Photographing by the Electric Light." A. G. Adamson.—*Dated July*, 1894.

No. 14,493.—"Improvements in Apparatus for the use of Electric Light for Photographic Purposes." A. G. Adamson.—*Dated July*, 1894.

PATENTS COMPLETED.

Improvements in Photographic Cameras.

No. 2223. James Wilson, 153, Tachbrook-street, Pimlico, Middlesex.—*June* 16, 1894.

My invention relates to improvements in photographic cameras, chiefly of the kind known as magazine hand cameras, and has reference more particularly to the construction and arrangement of magazine in which the plates are held, the object being to provide a convenient and compact form of camera, and one in which the plates swing down into position successively for exposure in any given focus. My invention further relates to means for focussing with quickness and certainty, as well as to other features hereinafter mentioned.

According to my invention, the magazine consists of a number of light metal frames or sheaths for holding and carrying the plates, and said frames or sheaths are of gradually increasing length, and are hinged or jointed to a back plate in such a manner that, when in the camera, they lie close together, like the leaves of a book. The camera is formed of two parts, one of which, hereinafter termed the sliding part, fits telescopically inside the other, and carries the lens, suitable means being provided for moving the sliding part in and out. The upper rear portion of the camera is cut away at a suitable angle, so as to form an aperture through which the magazine is inserted, and this aperture is provided with a flap or cover, which bears against the back plate of the magazine, this back plate having an inclination, when in the camera, corresponding to that of the flap or cover. When the magazine is in position, the plates are supported horizontally, the shortest frame or sheath being at the bottom and resting its edge upon a shelf or ledge formed in the sliding part of the camera above the lens, the upper frames or sheaths overlapping and projecting further and further forward by reason of their increasing length and the inclination of the back plate. By this arrangement the frames or sheaths can be caused, by moving the sliding part of the camera outward, to swing down, or fall successively off the shelf or ledge of the said part, and to assume a vertical position central with the lens, the gradually increasing length of the sheaths compensating for the inclined position of the back plate, and causing the plates to all come on the same level.

Suitable means may be provided for holding the sheaths securely after they have fallen into their vertical position, a convenient arrangement being a plate with a number of spring tongues pointing rearwardly so that the plates can pass freely over them in falling, but cannot move in the opposite direction. The plates are further secured in position by a suitable stem or rod, which can be manipulated from the back of the camera base, to cause a hook or catch on the said stem or rod to engage the plates, and pull them into position. The stem or rod is provided with numbers corresponding to the plates, so that it discloses the number of the plate with which its hook is engaged, by exhibiting a corresponding number on the end of the stem or rod. When not in use, this stem or rod can be pushed back into the base of the camera. A bell or other signal may also be provided to inform the operator each time a plate has fallen.

To facilitate focussing, a graduated scale is provided on the upper side of the sliding part of the camera, above which scale is secured, on the body of the camera, a graduated index or finger. The marks of the scale show the positions of the sliding part of the camera at which the successive sheaths will fall, each mark corresponding to one of the sheaths. The marks on the index or finger correspond to different focal distances, so that, after a plate has been allowed to fall, it can be rapidly brought to focus by bringing the corresponding mark of the scale in line with one or other of the marks on the index or finger.

The forward movement of the lens, with the sliding part of the camera, compensates for the increasing number of plates which have fallen, so that the same graduation of the scale and pointer serve for all the plates.

The claims are:—1. The magazine, consisting of a number of frames or sheaths of gradually increasing length, for receiving the plates, and adapted to be supported, at a suitable angle, in the upper rear part of the camera, and to be lowered successively into the vertical position as the sliding part of the camera is moved forward, substantially as described. 2. In a camera having its body formed in two parts, one sliding within the other, providing the sliding part with a shelf or ledge for supporting the magazine, and with a bell, or other signal, for indicating the falling of the plates into position, the base of the other part of the camera being provided with means for retaining said plates in their vertical position, substantially as described and shown. 3. In a camera of the kind referred to in the preceding claim, the combination therewith of the graduated scale on the sliding part of such camera, and of the graduated index or finger on the other part thereof, for the purpose of facilitating focussing, without manipulating the lens, substantially as described and shown. 4. In a camera of the kind referred to in the second claim, the combination therewith of the stem or rod, having a catch, and adapted to be worked from the back of the camera, and to engage the frames or sheaths, and so pull them, with their plates, into position when required, said stem or rod being numbered to correspond with the numbers on the said frames or sheaths, substantially as described and shown. 5. My improved photographic camera, having its parts constructed, arranged, and operating substantially as hereinbefore described, and as shown with reference to the accompanying drawings.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
6	Croydon Microscopical	Excursion: Haslemere, Hindhead, and Devil's Punchbowl.
6	East London	Excursion: Great Marlow.
6	Hackney	Exc: Virginia Water. Leader, G. Guest.
6	North Middlesex	Bank Holiday Outing.
6	Photographic Club	Excursion: Otford and Eynesford. Leader, Mr Bedding.
6	Sheffield Photo. Society	Discussion: *Technical Education Grant.* Introduced by Mr. Firth.
6	South London	Excursion: Culham for Burcott. By invitation of Mr. C. Higgins.
7	Birmingham Photo. Society	
7	Brixton and Clapham	
7	Exeter	
7	Hackney	Open Night.
7	Herefordshire	
7	Lewes	
7	North London	
7	Oxford Photo. Society	
7	Paisley	
7	Rotherham	
7	Sheffield Photo. Society	
7	West London	
7	York	
8	Leytonstone	
8	Munster	
8	Photographic Club	
8	South London	*Dry Collodion Plates.* William Tylar.
8	Southport	
8	Stockport	
9	Birkenhead Photo. Asso.	
9	Glossop Dale	
9	Hull	
9	London and Provincial	
9	Manchester Photo. Society	
9	Oldham	
10	Cardiff	
10	Croydon Microscopical	
10	Halifax Camera Club	
10	Holborn	
10	Maidstone	
11	Hackney	Excursion: Keston. Leader, A. Dean.
11	Hull	
11	Oldham	
11	West London	Excursion: Holland Park.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JULY 26,—Mr. R. R. Beard in the chair.

Mr. A. J. Humphrey was elected a member.

Mr. W. D. WELFORD showed a negative having a dark stain upon it, the cause of which he inquired.

Mr. W. E. DEBENHAM thought it to be a case of imperfect fixation.

Mr. WELFORD said the appearance of the mark was there before development.

Mr. P. EVERITT had taken a negative of the front page of THE BRITISH JOURNAL OF PHOTOGRAPHY, as proposed at the previous meeting. The negative had a dark spot upon it, as to the cause of which no explanation was forthcoming.

Messrs. Haddon, Everitt, Ashby, Teape, Rapson, J. E. Hodd, and others showed negatives of the front page of the JOURNAL, produced for photo-mechanical purposes.

Mr. W. E. DEBENHAM remarked that the two plates which appeared to be the best were developed with pyro-ammonia.

Mr. WELFORD thought the test was non-conclusive unless every one copied the same page. From the negatives shown, he said it seemed to him some had better printed copies than others.

Mr. Teape showed his copy, which was slightly imperfect.

Mr. SNOWDEN WARD thought there was as much difference between two copies shown as between the resulting negatives.

The results being, for the foregoing reasons, deemed unsatisfactory, Mr. EVERITT proposed and Mr. WELFORD seconded, that the competition be held again with a line engraving for subject to be used by all competitors. Intensification to be inadmissible.

Messrs. Henderson, Debenham, and Bedding were appointed to judge of the results, which are to be printed on gelatino-chloride paper, toned and fixed.

Mr. EVERITT mentioned that the *Graphic* had modified their offer to amateur photographers sending in photographs for reproduction, prizes and a fee of a guinea now being offered for each photograph used.

Mr. Everitt had experimented with zenotype, a toning solution for gelatino-chloride paper, and showed results illustrating the extremely red tones obtainable.

After other business the meeting closed.

PHOTOGRAPHIC CLUB.

JULY 25,—Mr. S. H. Fry in the chair.

Mr. WELFORD, referring to the question of the evening—viz., "Toning Methods"—and describing his invariable method, said that it was impossible to over-tone with it. The formula he used was:—

Gold	4 grains.
Water	6 ounces.
Phosphate of soda	1½ drachms.

Answering a question, he said this would do for two sheets of paper. Answering another, he said this bath worked well with Ilford P.O.P. and Solio. He used a fresh bath each time.

Mr. DUNMORE having questioned the utility of a combined bath,

Mr. HALSE said that Dr. Liesegang had claimed that the combined bath was advantageous, because it removed the unaltered chloride of silver at once.

Mr. DUNMORE asked how many grains of hypo were required to dissolve one grain of chloride of silver.

Mr. FRY said there would have to be a large excess.

Referring to a remark of the Chairman's, Mr. BIRT ACRES said that, in his opinion, a great amount of uncertainty would enter, if a chloride print were first put into a hypo bath; that was to say, a great amount of half-tone would be lost.

Mr. FOXLEE said there were toning baths and toning baths. Each paper-maker had a different one, so that he thought a distinction should be made. You could tone without a particle of gold.

Every one present agreed with Mr. BIRT ACRES in his remark that the present rage for cheapness was the sole cause of so many complaints of fading of prints, &c. He referred to the question of mounts. He had some prints on black and green mounts made twelve years ago which were as good now as ever. A want to cut down manipulation, the cost of material, &c., was, in his firm opinion, the cause of many present-day failures.

Referring to the matter of "fixing" a negative, Mr. Acres said that he certainly agreed as to the utility of a second fixing bath.

Mr. FOXLEE said the same applied equally well with a paper print. Referring back to the combined toning and fixing bath, he said that he had in his possession a print of the late Mr. Fry, made in the early "fifties," which was so toned, and mounted on a bronze-printed mount, which was still good. It was in the fixing bath for half a day.

Mr. ACRES questioned whether present-day papers would stand twelve or twenty-four hours' fixing.

The CHAIRMAN, referring to some observations by Mr. Foxlee, remarked that the failure of the combined bath, in so far that toning went on after all trace of gold had gone, only held good when the bath was in an acid state.

Mr. NESBIT criticised the assertion that the image on papers of to-day was only on the surface, as he could obtain a very good result by placing the back of the paper against the negative.

Mr. HAES said that this could be done with gelatino-chloride paper.

East London Photographic Society.—July 24, Mr. LEBLANC, the London representative of the Aktien Gesellschaft für Anilin Fabrikation, Berlin, gave a demonstration on Dr. Andresen's combined toning and fixing cartridge, exhibiting many prints on all the best-known papers toned with this agent. He prefaced his demonstration with a very lucid explanation of toning and fixing, and collected prints from members, and some he had brought with him, and proceeded to tone the same before the assembled members, the results proving his claim that the cartridge would tone prints made on any paper, the tone proving very rich indeed, and were accordingly praised by the members. After the demonstration the VICE-PRESIDENT proposed that Mr. Leblanc should have a honorary membership conferred upon him for his kindness in coming before the Society on several occasions, which was duly conferred. Mr. LEBLANC replied, thanking the members for their kindness, and assured them that he would always be willing to help on the science of photography. The Hon. Secretary distributed samples of papers sent for the members.

Hackney Photographic Society.—July 24, Mr. W. H. Sodeau presiding.—Members' work was shown by Messrs. Roofe, Guest, and Hudson. Mr. GUEST gave preliminary notice of preliminary excursion to Virginia Water on Bank Holiday next. Mr. AVENT showed a print from a hydroquinone-developed negative, and which was rather hard in contrasts. He asked for an opinion as to the cause. In reply, some members believed it to be a case of under-exposure, and with the developer not modified accordingly; others thought it to proceed from under-development. The HON. SECRETARY thought that hydroquinone to be unsuitable for portraiture, the combined developer—hydroquinone *cum* eikonogen—being better. With regard to the latter, he thought that the best formula for the combined developer to be that known as Graphol. Mr. RODER said he used the following quinol formula with good result:—A: Hydroquinone, 2½ drachms; potassium ferrocyanide, 6½ drachms; soda sulphite, 9 drachms; water, 35 ounces. B: Soda hydrate, 2 ounces; water, 12 ounces. For use, take two ounces one drachm of A and five to eight drachms of B. Commenting on this formula, some members questioned whether potassium ferrocyanide had any good effect. Mr. DEAN asked what was the objection to ferrous oxalate as a developer for negatives. In reply, the sum of the opinions expressed seemed to be that correct exposure was necessary, for there was little or no latitude of variation allowable for under or over-exposure.

North Middlesex Photographic Society.—July 23, Mr. Bram Goodwin, F.R.I.B.A., in the chair.—Mr. E. J. WALL read a paper on *Diaphragms*. The lecturer carefully explained the various faults to be found in lenses, and caused or cured by the use of diaphragms. Astigmatism; curvature of the field; flare, its cause and cure; spherical aberration; unequal illumination of the field; fixed-focus lenses, so called, what they really are. Regarding the use of very small diaphragms, Mr. Wall said that, after a certain point, instead of smaller stops producing greater sharpness, we got exactly the reverse—a fuzzy image—and that by the use of a diaphragm of, say, *f*-200, we should get much the same image as was given by a pinhole. The use of small stops—*f*-42 and *f*-64—was to be deprecated, as they jammed the various planes together, spoiling what otherwise would be good. In copying, it was well to remember that the stop or diaphragm had a different number. What would be *f*-16 used on a landscape would become *f*-32 when used to copy an object the same size. Light screens or diaphragms were to be recommended, as they cut off the surplus light that would otherwise fall on the bellows, lighting up the inside of the camera, producing a slight veil over the image.

The screens could be used either in front or behind the lens, the first method being preferable. Mr. Wall then described at some length the various diaphragms which have been produced from time to time, constructed to cut off light from portions of the plate or to produce round images in portraits, such as the Pandian pipes, butterfly, star, triangle, &c. Mr. Wall, however, condemned them almost *en bloc*, as he said that round diaphragms were the only sensible ones to use. Lenses being round, we must use round diaphragms, no other surface will cut the margin equally off.

Darwen Photographic Association.—On July 25, the President (Rev. Hy. Irving) in the chair, a series of photographs of Whalley Abbey, the property of the President, were submitted; also some Daguerreotypes, the property of Mr. Jno. T. Taylor, which were taken not later than the year 1850 (forty-four years), and are still in a state of good preservation.

Bath Photographic Society.—By kind invitation of the Very Rev. Monsignor Williams, the members had the pleasure of again visiting Prior Park and photographing the noble pile of buildings and magnificent grounds. The day was very fine, and the sunlit landscape fringed on either side with heavy foliage formed a most striking picture, full of contrast and beauty. Similarly fortunate were those photographers who expended their skill on the buildings. The intensity of the light being favourable for the work, it may be roughly computed that fully fifty pictures were secured on this occasion, so numerous are the subjects to a practised eye. At five o'clock our host very generously had tea served under the portico of the mansion, from which elevated position an expansive view, in fact the most extensive view of Bath and its surrounding hills, is presented to the gaze. Mrs. Hurrell, one of the ladies of the party, officiated at the tea urn, Mr. Austin J. King assisting the host by occupying the vice-chair. Some further photographic work was pursued after tea, and thus a most enjoyable day was brought to a close.

Leicester and Leicestershire Photographic Society.—One of t e most enjoyable trips in connexion with this Society took place on Thursday last, when sixteen members and friends went by the new Dore and Chinley line to Hope Station for Castleton and Edale—a new part of the peak of Derbyshire opened up by the new railway, full of beautiful scenery, mountain, water, ruined old castles—everything calculated to cheer the enthusiast in photography; and, although the weather was not by any means photographically perfect, yet the number of negatives was quite up to the average, and the misty, cloudy atmosphere rather helped than not. The party climbed the rugged steep leading to the old castle, from whence the town takes its name, then down the pass into the village, where bits abounded, the rivulet from the mountain purling through the village street, the immense "Cavern of the Peak," with the ropewalk running for hundreds of yards into its dark abyss, and the stupendous canopied entrance (261 feet high and 114 feet in breadth), and altogether offering a choice of photographic wealth which would be hard to beat in any inland town. The attention of brothers in the art is earnestly directed to this lovely country. The party was under the guidance of Mr. Thomas Scotton, Photographer to the Midland Railway, who is acquainted with the district, and whose knowledge of the country materially helped to make the outing so successful.

Longton and District Photographic Society.—July 5, the President (Rev W. J. Smith) in the chair.—Mr. W. Tylar, of Birmingham, delivered a lecture to a small, but appreciative audience on the *Hill-Norris Dry-collodion Plate.* The lecturer stated that the Hill-Norris plate had all the advantages but none of the disadvantages of the wet-collodion plate, which so hampered the latter in its fight with gelatine plates. He predicted that in a very short time the dry-collodion plate would be in very extensive use. The lecturer then proceeded to expose, develop, and fix a Hill-Norris lantern plate, which, in less than ten minutes from the time of exposing, he was able to exhibit in the oxy-hydrogen lantern, in proof of the extremely easy and quick manner in which this plate may be worked. He also exhibited some thirty or forty slides in order to illustrate some of the chief points in his lecture. A number of the finest slides exhibited had been taken by the lecturer himself with an ordinary Tit-bits camera. A very hearty vote of thanks was accorded Mr. Tylar by the meeting on conclusion of the lecture. A number of very interesting prints and enlargements from negatives taken on the last excursion of the Society to Astbury and Moreton were shown and much admired. It was decided that the next excursion of the Society should be to Dovedale on the 26th inst.

Photographic Society of Japan.—June 8, Mr. C. D. West, M.A., in the chair.—Mr. Kajima Seibei showed a number of bromide prints of various tints, some of which were particularly pleasing. The colours shown were brown, or "red sepia," green, two distinctly different blues, and yellow. Mr. Kajima gave the following description of his method of producing these prints:—The prints are exposed, developed with eikonogen in the usual way, fixed in a neutral bath without the interposition of an acid bath, and thoroughly washed. They are then treated with the following solution:—Nitrate of lead, ½ ounce; red prussiate of potash, ¾ ounce; water, 12 ounces. This converts the image from black into a faint yellow. The prints are again thoroughly washed, and the yellow image is then toned to different colours with various solutions, as follows:—For blue: Perchloride of iron, 5 drachms; water, 6 ounces. For another blue, called by some a "black blue," the prints are treated with a weak solution of ferrous sulphate. The strength of this solution is not material. For green: Neutral chromate of potassium, ½ ounce; water, 12 ounces. The prints are washed, and are afterwards treated as for the first of the two blues mentioned. For brown, or "red sepia:" Copper chloride, 5 drachms; water, 6 ounces. The action of this solution is very rapid. For yellow: Mercuric chloride, 90 grains; iodide of potassium, 150 grains; water, 8 ounces. The action of this solution is very slow, but the prints darken considerably in drying. By continuing the action for a long time, a very pleasing colour, that might be described as "light brown," results. Messrs. W. K. Burton and T. Kondo showed the results of the use of orthochromatic plates with a yellow screen for portraiture. The result, in the case of people of dark complexion, was remarkable. In the case of the orthochromatic plate, the necessity for retouching was almost done away with, and a result obtained that could not be got by any amount of retouching in the case of an ordinary plate. The photographs taken on ordinary plates looked like caricatures besides those on the orthochromatic plates. Professional photographers had been prevented from using orthochromatic plates for their ordinary work in the studio on account of the difficulty of a colour screen, which is quite necessary to get the full advantage of orthochromacy, but this difficulty was overcome by the use of a sheet of ordinary patent plate coated with picrated gelatine fixed in the dark slide in contact with the sensitive film, as described at a previous meeting of the Society. Mr. Burton showed an "iris diaphragm" shutter by the Bausch & Lomb Optical Company, of Rochester, N.Y., U.S.A. He pronounced it unmistakably the best shutter he had ever seen. It opened and closed at the centre, as shutters intended to work between the combinations of a lens ought to, and the opening was nearly circular from beginning to end. The time taken for opening and closing was only a fraction of the whole time of exposure, to that the "co-efficient of light" was remarkably high. The exposure could readily be varied between one one-hundredth of a second and three seconds, or a "time exposure" could be given without the necessity of keeping pressure on the pneumatic release. The shutter did not open in "setting," and, by a particularly ingenious device, the vanes which opened and closed to give the exposure could be set to open to any desired aperture, so that they acted as an iris diaphragm as well as a shutter. The workmanship, all in metal, was of the highest degree of excellence.

FORTHCOMING EXHIBITIONS.

1894.	
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road South Hackney.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

"PHOTOGRAPHY IN COLOURS."

A Reply to Mr. Wall, *vide* p. 424 of this "Journal."

To the Editor.

Sir,—In the above-mentioned article Mr. Wall does me the honour to mention my name in connexion with the history of photography in colours, but with such erroneous statements in regard to my researches * that I am obliged to correct him in some cases.

Mr. Wall says, p. 425: "In 1873, Dr. H. W. Vogel, of Berlin, accidentally discovered that addition of certain colouring matters to the emulsion made the silver salts sensitive to yellow," &c.

Is that quite correct?

Permit me to tell the story of the discovery. I made in 1873 experiments in taking the spectrum with bromide, iodide, and other collodion plates of different kinds, for studying the connexion between absorption of light and chemical action, declared first by the elder Draper and Sir John Herschel fifty years ago. All bromide plates gave a most intense action in the spectrum blue, but only a very weak action in the green. Only one batch of dry plates gave, in my hands, to my great astonishment, a second maximum of action in the green (Fraunhofer line, b.E.), where generally the silver bromide shows no absorption. I published that in the German *Nature*, but afterwards I asked myself, What is the reason of this strange behaviour? The answer I gave by deduction was, It can only be absorption. Then I was convinced that, where no absorption is, there is no chemical action. But which body absorbs the green? The bromide of silver does not do it. So I came to the conclusion that it is a strange body in the plate, which absorbs the green rays, and makes the plate sensitive for these rays. Which body is that? I couldn't find it out by analysis. Now I began to work synthetically. I bathed a pure bromide of silver plate in solution of coralline, which absorbs green rays, and, eureka! this plate was sensitive for the green rays of the spectrum. I coloured another plate with a body (aldehyde-green) which absorbs the red rays of the spectrum, and I stated that the plate became sensitive to red. I coloured a plate with fuchsin, which absorbs green-yellow rays, and observed that the coloured plate was sensitive for green-yellow. So I discovered that it is possible to make photographic plates sensitive for any rays called, till 1873, non-actinic. Is this way of making a discovery a merely accidental one? I believe not.

The only accident was that a plate came in my hands which showed sensitiveness to green. But the reason why I discovered by deduction and confirmed by experiments.

On the same page (425), Mr. Wall calls my photochromic principles

* Though he asserts (p. 442) to "have made careful search through almost all, if not all, papers by these gentlemen (Vidal and Vogel) that have been published."

published in 1885, as "practically and theoretically wrong." That is only the echo of Mr. Ives's opinion. Mr. Ives, in a paper published in the *Journal of the Franklin Institute*, gives a totally wrong description of my principle of heliochromy (published 1885). But this principle was worked out with perfect success by Mr. Ulrich in 1889 and 1890 in collotype, and by my son, Dr. E. Vogel, and Mr. Kurtz, of New York, in autotype in 1892.

The complete success of my principle in practice in 1889-90, was acknowledged by our first German painter, Adolf Menzal, our first German art critic, L. Pietch, the chief director of our industrial art museum, Dr. Lessing, and many other authorities. The practical results will prove that my theory is not "practically wrong." I can even give a testimonial from a gentleman who is an authority on such matters, the chief of the photo-mechanical part of the Military Geographical Institute at Vienna, Baron von Hübl. He says, "The principle of Dr. Vogel is right beyond any doubt!' (*Photographische Correspondenz*, December 1893.)

Mr. Wall has this paper of Mr. von Hübl, and cites long sentences from it. Why did he forget to cite the above-mentioned sentence in favour of mine?

Perhaps he didn't like it, because it troubled him in his glorification of Mr. Ives. Mr. Ives is strongly attacked by Mr. Vidal, and Mr. Forrestier, Paris, as the "jealous Yankee," who asserts to have done all in heliochromy, and depreciates all that other men have done in the same direction.

But I confess I have not worked in lantern pictures. My intention was to make permanent prints in natural colours as true as possible, and therein I have succeeded by my theory, called "theoretically and practically wrong" by Mr. Ives and Mr. Wall.

One printing establishment in Europe (Bügenstein, Berlin) and one in New York (Kurtz) worked after that principle for two years successfully, in spite of Mr. Ives, who warns the people against my process (because he himself didn't succeed in photo-chromic printing).

One printing house in New York ordered Mr. Ives, in 1893, to make a three-colour print after a coloured original. Mr. Ives answered he could not do it yet. Afterwards Mr. Kurtz did it.

Mr. Wall says further that Mr. Weissenberger was the first who succeeded in making three-colour prints. But Mr. Nadherny, who first sent Weissenberger's prints to the Photographic Society of Vienna, says himself in his paper (*Photogr. Correspondenz*, p. 213, May issue): "In September of last year (1892), after the photographic press had criticised the Vogel-Ulrich process, Weissenberger began to make trials at the request of his chief" (p. 214, *Corr.*, 1893). The fact is that Mr. Ulrich and I already exhibited in the month of May, 1892, in Berlin, a great many proofs of our photo-chromic printing process, executed after my principle above mentioned, and acknowledged by the first painters. Mr. Weissenberger came a year later.

Mr. Wall says further: "Vogel stated that the printing ink must be spectroscopically identical with the colour sensitisers—this is false, as pointed out by Mr. Ives."*

I answer that, if Mr. Wall will instruct the people over my process, he may read my papers in the original, and not the wrong extracts and wrong statements of my adversary, Mr. Ives. I have very well pointed out my principle (see page 138 of my *Photographie farbiger Gegenstände*, 1885).

Mr. Ives gives merely suggestions, as the word "probably" shows; I give statements founded on experiments.

Mr. Wall seems to regard Mr. Ives as an infallible pope, and, when Mr. Ives says "it is false," Mr. Wall repeats merely the same words without proving Mr. Ives's arguments. So he gives an argument of Mr. Ives against my rule (to print with the optical sensitisers under certain conditions), repeating Ives's words: "Suppose we use cyanine and erythrosine for one set of negatives, and cæruleine and rose Bengal for another set, we probably (!) should get absolutely identical negatives."

This is not true. Erythrosine sensitisers for wave-length 560, and rose Bengal for 589 (Dr. E. Vogel), cyanine sensitisers for wave-length 6B (Eder), cæruleine—weaker, but by far farther in red (Eder).

Mr. Von Hübl, chief of the photo-mechanical department of the Military Geographical Institute of Vienna, has confirmed it in his paper over my process (December issue, 1893, *Photogr. Correspondenz*).

Mr. Wall writes "that Mr. Ives has abandoned the idea of using heliochromy for printing surfaces." Mr. Ulrich, Dr. E. Vogel, and I have exercised this idea on the base of my photo-chromic principle ever since 1885, and before Ives's patent of 1890 was known, and we will exercise it further also at our great printing establishments as above mentioned. We let Mr. Ives have the pleasure of making fugitive lantern slides. The idea of making photochromic lantern slides is an old one, and already mentioned by Cros and Ducos du Hauron, as Vidal has pointed out.

If Mr. Ives has made improvements in this direction I shall not trouble him. Let him employ always the Young-Hemholtz theory for his purpose, but he has no right to fight against another principle which is not his own, and which is worked out successfully in practice now, and even he has no right to give wrong statements to depreciate this principle.

I have been an investigator and professor in photo-chemistry for thirty-five years, in spectrum analysis for twenty-two years, and in colour theory for twelve years at the Royal Polytechnic Institution here; therefore I am very well acquainted with this matter, and can learn nothing from the young Mr. Ives.

I call attention to the fact that I am not the only one who has had the honour to be attacked by Mr. Ives. The same honour has been given Mr. Lippmann, Paris, because he discovered a new process of heliochromy. That is the reason why Mr. Forestier called Mr. Ives the "jealous Yankee."—I am, yours, &c.,

DR. H. W. VOGEL.

Berlin, July 15, 1894.

* Mr. Ives gives merely suggestions, as the word "probably" shows; I give statements founded on experiments.

NON-PERMANENCE OF GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—Every photographer is interested to see in your columns weekly as much as possible about the permanence or non-permanence of gelatino-chloride prints, as, look where one may, over his own premises or in the shop windows of our cities, the same eye-sore of changing and fading gelatino-chloride photographs presents itself. It is vain surely to tell us about their theoretical permanence when the practical part belies the statement. For myself, I am getting heartily sick of the seductive and fleeting beauty of gelatino-chloride prints, and I feel myself almost crying aloud for a more workable collodio-chloride paper, as that in the market is vexing in practice and in results; one kind is leathery, another cracky and——Indeed, I sometimes think I'll have to go back to fresh albumen. For over forty years now, thousands of my own self-prepared albumen photographs are well to the fore in vigorous yet modest tones. Here and there they look a little rough and rusty; all the same, they are good to all appearance for a century to come!

Of course the modern demand for high finish and bonbon-box portraiture can hardly be fought against; it is like an overwhelming tide, and unless one can retire smiling he must float on its living waters as best he may, and, if his conscience has qualms about the non-permanence of his work, he can do little more than lament the ever-changing appearance of his photographs.

Help us, Mr. Editor, to secure permanent prints! Of course you do; but don't talk about autotypes and platinotypes, for, although I prefer such in my private rooms, the million won't have them in this "age of sweetness and light," when individuality is scouted as an injudicious twist of nature. So, while I cry for Permanence, Polish and Purity is the cry of

WHITE CUFFS.

Glasgow, July 30, 1894.

A CALL TO ARMS.

To the EDITOR.

SIR,—How very kind of Messrs. Cadett & Neall to reply to my remarks, not that the cap fitted them—oh no, not at all!—but simply because my letter brought up the relative positions of professional and amateur.

My letter did nothing of the kind, Messrs. Cadett & Neall. I attacked manufacturers (you principally, if you like) who, for their own selfish (£ *s. d.*) ends promote amateur competitions. I contend that dry-plate manufacturers who derive the *largest* amount of their income from professional photographers *have no right* to promote amateur competitions, that is provided they wish to retain that income from the professional; also that they (the manufacturers) should give the professional the same advantages they give to the chemist dealer.

There was no occasion to use a mask to cover up the grievances that professional photographers have. I stated them in plain English, and, I thought, politely. I think there is a lot of unnecessary padding in Messrs. Cadett & Neall's letter. We all know about the drawing-room album and amateur retouching, and if Messrs. Cadett & Neall would tell us something we didn't know it would be appreciated.

Perhaps I am one of the comparatively few professional landscape photographers where the amateur is more competitive.

Messrs. Cadett & Neall *admit* it is very annoying to the professional who uses a large quantity of plates to be put upon worse terms than the local chemist. Why don't you remove the annoyance, Messrs. Cadett & Neall? Messrs. Cadett & Neall think my remarks on the late firm of Samuel Fry & Co. (Kingston-on-Thames) extremely rude. The truth is a bitter pill to some people, and *I think* that Messrs. Cadett & Neall would like to pose as the acme of politeness; but their remarks, that professional photographers are proverbially bad payers and fond of long credit, are not in very good taste with their politeness, and are what I call a studied insult to the whole profession, their best customers, and who, I should think, will best know the way to return the insult with compound interest.

As Messrs. Cadett & Neall have such a contempt for the professional, would it not be better for them to call their new plate by some other name, for instance, the "Bad Payer," the "Long Credit," the "Dealer," and not the "Professional"—then it would be more consistent with their character of the professional?

It may interest Messrs. Cadett & Neall that, previous to their promoting amateur competitions, I was using their plates to the tune of nearly three figures per annum. I am not using them now, and shall do my

best to induce other professionals to patronise those manufacturers who do not promote amateur competitions.

I should be glad to know the address, objects, and aims of the National Association of Professional Photographers. I wonder, Mr. Editor, if there will be any dispute as to who "*took*" the Convention Group *this* year?—I am, yours, &c., RUDDER GRANGE.

July 30, 1894.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

P. DUFFY.—The photograph of lightning is very good, but not uncommonly so.

D. J. S. (Leeds).—The closest imitation of silver prints in patterns of textile fabrics would be collotypes with the usual glazed surface—that is, varnished with a solution of shellac.

T. C.—As it is mentioned that the information is wanted only to decide a bet, we decline to give it. This would have been the case even had name and address been enclosed, which was not done.

C. W. W.—The pictures, though printed and published in Germany, are certainly copyright in this country. If you pirate them, you may be pretty certain of being proceeded against as soon as the piracy is found out.

ARTHUR HANDS.—The markings appear to us to be due to some fault in the emulsion. Are you aware that you sent the negative by post in an ordinary envelope, and would you be surprised to be told that it arrived here in fragments?

FOCI.—We should not recommend you "to take an interior by means of a pinhole." Use a lens of the required length of focus. A comparatively small stop will be advisable. From what you say your eight and a half lens will be of too long a focus.

A PROVINCIAL PROFESSIONAL.—We can suggest no new picture that you could introduce as a novelty "to give a fillip to business." Why not try the imitation ceramic pictures referred to in another page? Though not new, it might prove a novelty, and possibly a profitable one.

CYNICUS.—No work is published on the subject, though a good article upon it appeared in the back volumes of the JOURNAL when gelatine plates were first introduced. The thing is very simple, and more practice will overcome the difficulty. The lumps are apparently due to faulty emulsion, probably imperfect filtration.

E. EDWARDS.—If the spots are in the paper you had better communicate with the makers. The bath in question need not be made the day before using it. An enamelled iron dish is not a good vessel for fixing in if the enamel is at all imperfect. If it is, that may be the cause of the trouble. Try fixing in a porcelain dish.

JUNIOR ASSISTANT.—The matter is very unfortunate for you, and your late employer is very uncourteous not to reply to your letters. No doubt he has made the "other arrangements" foreshadowed. After so long an absence, even through illness, we do not see that you have a right to still consider yourself in his employ.

INVENTOR.—Yes. The invention can be patented: but, before a patent is taken out, it is well to consider two points. One is, if the invention is original, so that a valid patent can be obtained for it; the other is, whether there is any commercial value in the invention. Without knowing anything of the details, we have great doubts on both points.

R. SPENCER.—The formula, as given in the ALMANAC, is quite right. It is not all samples of pyroxyline, however, that are suitable for a collodio-bromide emulsion. According to your letter, you seem to have compounded the emulsion correctly, and the only suggestion we can offer is to get two or three samples of other pyroxilines, and try again with them.

H. B. STRONG.—1. We have no knowledge of any method (such as yours) having been used for giving time exposures with the focal-plane shutter. Better communicate with the makers on the point. 2. The shutters are now fitted with small chains, which allow of the aperture of the slip being increased or diminished. See p. 1083 of the ALMANAC for 1894.

OLD LEYSIAN.—1. All things considered, the carbon process. 2. We have no experience of the process, but believe it to be a perfectly practicable one. 3. Yes, backing is certainly to be recommended. 4. Yes; although some claim that orthochromatic plates minimise the defect. 5. We cannot say what prices stereoscopic negatives should command. Communicate with Messrs. G. W. Wilson & Co., or some similar firm. 6. We presume the lenses are for stereoscopic work; in that case the three marked "A" would be preferable. As to particular makes, however, we do not express any opinion.

R. BOND.—There would be nothing new in a combined toning and fixing bath that contained no gold, the toning being due entirely to sulphur. Such baths were in common use in the very earliest days of the art. It is quite possible, however, that you may have something different from what has been done before. As we have just said, a toning and fixing bath in which gold is absent would not be a novelty.

A. A. LASCELLES says: "I want to expose some plates in a place that is without daylight—in fact, quite dark. My only way of doing this is by the use of magnesium ribbon held in the hand. Can you please tell me the relative exposure as compared with good daylight?"—All will, of course, depend upon the *quantity* of magnesium burnt. Better expose two or three trial plates, burning different quantities with each.

LIVERPOOL.—So far as we are aware, the particular process—that is the orthochromatic part of it—by which the majority of reproductions of paintings are made on the Continent, is not worked in this country, or, if it is, only to a limited extent. Whether that is why the foreign reproductions are alleged to be so far superior to English work we are not prepared to say. It is a matter of opinion whether English work is so very inferior.

ONE IN EARNEST.—All that has been published on the subject has, from time to time, appeared in our columns. In the ALMANAC for 1893 will be found the various methods of producing printing matrices. Refer to them, and adopt such as best suit your requirements. All photo-mechanical processes require considerable experience to work them as successfully as they are now worked commercially, and perfection must not be expected from a few scores of experiments. But don't be disheartened.

AMAT says: "I am very much afraid that my sensitive plates—changed at night in my bedroom by reflected white light—have been fogged before exposure. Will you kindly suggest any precaution that it would be advisable to take *before* proceeding with development, so as to minimise the bad effect of such probable fog, and oblige?"—Try the effect of the following solution: Chromic acid, 30 grains; potassium bromide, 60 grains; water, 10 ounces. Immerse the plates in the solution for one or two minutes; afterwards wash thoroughly.

AGRI.—1. The labels are not, so far as we are aware, obtainable in this country. Fallowfields and other large dealers will supply you with labels in a variety of languages, which will answer the purpose. 2. We fear that any attempted precise information as to the relative "actinic power" of the light in Switzerland and this country would be fallacious, but, generally speaking, and from the experience of others, the light in both countries, at its best, would seem to be about equal in photographic power. We should recommend you to take the quicker brand of plates.

TRURO writes: "For some little time I have been practising painting backgrounds in distemper, and obtained satisfactory results. I have received a commission to do two, conditionally that they are done in flatted oil, but the quantity of turpentine used in making the surface dry dull affects my lungs and makes me ill for days. I should esteem it a favour if you will answer if there is any means of making the oil colour dry dull without at any rate such quantities of turpentine."—If the colours be mixed with Japanese gold size, probably a smaller proportion of turpentine might suffice. Flatting should always be done in a well-ventilated place. We have not heard before of turpentine affecting the lungs.

W. T. says: "I will be much obliged if you will suggest a good medium to apply to the burnished portions of machines in order to prevent reflection when photographing them. I can generally have them moved where the light is in such a direction as to, in a great measure, do away with reflection, but am undertaking work in which this may be impossible. You may be able to suggest the right thing, and so save me much useless experiment."—Mix some white lead, to make a light slate colour, with turpentine, and add a little gold size. Paint the bright portions of the work over with this. It will dry with a dead surface, and may be cleaned off, after the photographs are taken, with some cotton waste, moistened with benzoline or turpentine.

PHILOLUX writes as follows: "Last October I took a business in North London, and paid 60*l.*, half purchase, under the impression it was to yield 10*l.* weekly. I find, during nine months, this is a quarter of the truth. Instead of going further *re* balance of purchase, have I not grounds both to do this and also make seller either show cause why he should not return cash advanced or prove the place has not been misrepresented? I have a first-class operator and artist in charge, who graduated at the art school here. He says it will be a long time before place returns 10*l.* weekly. A reply in next issue will greatly oblige."—If it can be proved that the returns of the business were misrepresented, it would be good grounds for resisting further payment and instituting an action for the return of the money paid. Better place the matter before a solicitor, who will advise you in the matter.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1788. Vol. XLI.—AUGUST 10, 1894.

PORTRAIT BACKGROUNDS.

ONCERNING the merit or demerit, the æstheticism or otherse, of a background to a portrait in which is represented me scene in nature, we have nothing to say at present yond this, that in this matter there is more taste displayed the present time than was the case thirty or forty years ago. Many perhaps may not be aware that the scenic background as first introduced by the late M. Claudet, who, in 1841, tained a patent for the invention. Claudet, however, was an tist as well as a man of science, and knew how to keep a ctorial background in subordination to the figure, which uld not be said of a tithe of the numerous photographers ho sprang up in vast numbers after the application of coldion to the art. With the great mass of these, sharpness of very detail in the background and in the dress of the sitter as the desideratum. In some instances the lighting of the ene harmonised with that of the figure; in others, the one as lighted from the left and the other from the right, while most cases the perspective was a terror.

Things have considerably improved since those earlier days ere thought of, but to realise that the evil still lingers one as only to examine the every-day work of the photographer ho does not appear to have made the acquaintance of any of the anons of art.

A great fault with some scenic backgrounds which we have tely had occasion to examine is the amount of sharp detail ut in them. During the time that the mania for well-defined ackgrounds prevailed, it was providential that what at that eriod constituted a species of natural difficulty was interposed, or, the plates being much less sensitive than they now are, the enses had to be worked with a large aperture, in order to prent the sitting from being too protracted, and this large perture, in turn, was hostile to fine definition on whatever was ot in the sitter's plane.

We know of a photographer whose portraits are real pictures, and are richly worthy of the admiration they usually licit, who invariably prepares his own backgrounds. The rofessional background painter does the more mechanical work, ut the finishing is done by the artist himself. The design s of a light, sketchy, suggestive character, and is so subordinated to the figure as never to set up a claim for attention o itself, partaking, in these respects, of the features which haracterise the backgrounds of a well-known American maker, nd which are prized for these properties by all the leading hotographic artists in that country.

The nearer a background approximates to a severe plainness, the better do we like it. Still, there are many occasions in which it may be necessary to make use of a scenic one, and we have for many years recommended photographers to acquire the art of making their own, to the extent, at least, of being able to lightly sketch in a local scene in preference to either an imaginary or a strange one. This, we feel assured, would conduce to success in business, and we have suggested that, if artists at fashionable marine watering-places, who occasionally crowd their studios with boating and other nautical paraphernalia and seascape backgrounds for use with them, would substitute faint, sketchy backgrounds of the *local* beach and surroundings, they would be much appreciated by their sitters, and would probably lead to considerable augmentation of business.

To do this the services of a professional background artist will not necessarily be required, because what is wanted is a suggestive, sketchy drawing, devoid of detail, and this every photographer can make for himself. A lantern picture of the scene projected on the background after business hours would furnish the theme, and all that is then necessary is to trace the salient points of the scene with the chalk pencil, introducing other features where it may be necessary to improve the composition. Broad effects may be given by a sponge charged with lamp-black or powder of any desired shade, and used as a crayon. These may be further enhanced by the judicious application of a soft shoebrush, a system that was patented at one time by an eminent artist, Robert Faulkner, since deceased. His specification suggested the mixing together of whiting, lamp-black, Venetian red, or other colours in powder with powdered dextrine, the unblackened calico ground being made wet when the colour was applied. A variety of tints were prepared.

We do not counsel the introduction of cast shadows in a scenic background, but as lights are necessary, even in the most sketchy and subdued ground, it is imperative that they be made to harmonise with that which falls upon the sitter. It is also imperative that the horizon line be placed in true, or nearly true, relation to the height of the camera and the sitter's head, a thing seemingly ignored by many background painters, who place their horizons as if the camera were being used at a distance of twelve or eighteen inches from the ground.

Although we have specified fashionable marine watering-places as localities where local scenic backgrounds may be used with pecuniary advantage to the photographer, it will be evident that this is only typical of numerous other places and conditions under which portraits may be taken.

GLYCIN.

Although from the length of time it has been before the public it is scarcely correct to call glycin a new developer, it may yet be looked upon in that light to some extent, owing to the comparatively little attention that has been given to it. The reason for this apparent neglect is to be sought for rather in the fact that, while glycin possesses no features that place it conspicuously in front of others of its rivals, it suffers under the slight disadvantages of slowness of action and a very low degree of solubility, qualities which, while they are not practically detrimental, have still had some influence on its popularity.

In our own earlier trials of glycin, we were not struck by any special points in its behaviour that marked it as being superior, or even equal to, metol or amidol, though probably, had these two been out of the way, we should have been inclined to give it a position in front of either hydroquinone or eikonogen, since, while it equals, or perhaps surpasses, these in cleanness of working, it excels the former in its power of searching out detail under short exposures, and the latter in its capability of rendering density. In the first respect, in fact, it most resembles metol, although it is more deliberate in its action, while at normal strength it more readily gives printing density under circumstances where, with either amidol or metol, it might be deficient.

It was mainly owing to the excellent character given to glycin by our old friend Mr. W. J. Stillman two or three weeks back that we were induced to give it a more extended and exhaustive trial than we have hitherto done, or rather a series of trials, in which its capabilities have been tested very carefully against other developers, but chiefly against metol, which we take to be the most formidable rival of pyro. The outcome of those experiments, made both in the studio and out of doors, as well as with the sensitometer, is, we think, to leave metol still in front for all-round purposes, although in some respects, and especially with some workers, glycin probably runs it very close.

The first difficulty with glycin is its very low degree of solubility in water alone, scarcely two grains to the ounce being taken up at the ordinary temperature, though it is more freely soluble with heat. As, however, there is no call for a plain aqueous solution, and the presence of sulphite of soda and an alkali considerably increases the solubility, this can scarcely be deemed a serious defect, for, as a matter of fact, it is perfectly easy to make a stock solution of a sufficient degree of concentration to bear dilution with three or four volumes of water or even more. For the purposes of our experiments we made a stock solution composed as follows :—

Glycin	240	grains.
Carbonate of potash	2½	ounces.
Sulphite of soda	2½	„
Water	10	„

preferring to make what modifications we deemed necessary by the addition of definite quantities of the individual ingredients as might seem expedient. The above formula is very similar in composition to that issued by the makers as a one-solution formula for "hard" development.

The directions given by the manufacturers of glycin are to dissolve it first in distilled water, and to subsequently add the remaining salts; but, independently of the difficulty of getting that quantity of the substance into solution, even when hot water is employed, we find a very marked discolouration occurs, which is still further increased on the addition of the alkali a sulphite. The preferable plan is, we think, to make a l solution of the two latter salts, and to add the glycin la when it dissolves without much trouble, forming a nea colourless solution, which, in its concentrated form, keeps w and retains its energy as well as any of the other develope As may be imagined from the quantity of solids held in sol tion, the stock developer is almost syrupy in its nature; bu when diluted for use, it becomes as fluid as the ordinary m tures. For normal requirements, we use this stock soluti diluted with from three to six times its volume of water, a cording to the degree of density or hardness required. F portraiture in the studio or indoors, the smaller quantity water will give softer gradation, whereas, for landscape wor the weaker solution and slower development will give th necessary contrasts for that class of subject.

Compared with metol, which, as already stated, we accept the best of the newer developers, glycin is decidedly slower its action, even when employed without restraining bromid The character of the image it gives is, however, very similar- at any rate when a sufficient exposure has been given, for i cases of short or under-exposure sensitometer and other test show conclusively that metol possesses a greater power i getting out detail, although glycin will, under most circun stances, give more vigour.

Tried side by side with hydroquinone, the latter was foun to be slower in action than glycin, and much inferior in it power of bringing out detail with short exposures, and, othe things being equal, the image produced by hydroquinone i much denser, and generally harder. This is especially notice able when used without restraining bromide, or when th quantity is reduced to a minimum, as hydroquinone require bromide less than does glycin, and resents its use, if we ma employ the expression, more readily.

With regard to the employment of bromide, it is usual t say that it may be dispensed with altogether, not only in th case of glycin, but also with metol, amidol, para-amido-phenol and the rest of the new developers. But, in practice, it wil scarcely ever prove a wise course, as even with the very bes and cleanest of plates the action of the developer unrestrained is too energetic to avoid some little shadow fog in case of shor exposure and thinness of image if the exposure have beer ample. It is quite true that any of the substances named *may* be used without bromide if the conditions are favourable, bu we think in all cases a better result would be obtained with a least a small proportion of the restrainer. As pointed out years ago by Mr. W. K. Burton, the bromide merely retards without arresting development, and with even the shortest exposures the addition of bromide need not be feared. This is more especially the case with glycin than with either metol or amidol, and we have found a ten per cent. solution of bromide a very useful supplement to its use.

So far as we can judge at present, glycin is decidedly inferior to metol in the power it offers of repeated use, its energy being very materially decreased by each successive plate developed as well as by mere lapse of time—without use —after dilution. In the case of metol we have successfully employed a developer six weeks after its first dilution for use, without any fresh addition, and under ordinary or normal circumstances; but a similar solution of glycin in less than a week was badly discoloured and utterly devoid of all developing power, although it had only been used for a single development.

The single-solution developer, the formula of which we have iven, appears capable of serving all purposes within reason if ıpplemented by separate solutions of bromide and of alkali ›r use where the conditions are beyond the normal. For rdinary variations in exposure or in subject, a greater or less egree of dilution will generally suffice to meet every want; r, in extraordinary cases, the addition of one or other of the xtra solutions for great over or under-exposure, or where, om the character of the subject, some special treatment is equired, will do all that is required. With metol, and also midol, but especially the latter, varying the proportion of ulphite will often exercise a considerable effect, but this does ot appear to be the case to anything like the extent with lycin. When the proportions of four parts of sulphite to one f glycin are passed, little, if any, alteration in the behaviour f the mixed solutions is noticeable, and, for the sake, there-ore, both of economy and of convenience, the proportion may e kept as low as possible.

Employed by itself, glycin has impressed us as being useful n such cases where metol is found to give density with some lifficulty, as it does with some brands of plates; but, where here is no trouble of that sort, we should still give the pre-erence to metol, not only as possessing greater power in bring-ng out detail with a minimum exposure, but also as being nore generally manageable. Metol, in fact, we still consider o be the best all-round developer, although glycin, which runs t very close, will, no doubt, find admirers amongst those who ail to get the vigour they desire with metol.

HAND-CAMERA HUMOURS.

Men not yet middle-aged can recollect the time when the appearance of a bicycle or tricycle in the streets of a city provoked the *gamins* and older wits of the pavement to an indulgence in utterances of an ironical or sarcastic nature at the expense of the cyclist and his machine. Those utterances, which occasionally took a coarse and uncomplimentary cast, were possibly outdone in point and bitterness by the objurgatory criticisms of incensed Jehus, whose horses were prone to be disturbed by the swiftly moving silent wheel, so that, on the whole, the life of a cyclist in the early seventies was at times such as necessitated considerable patience and indifference to ridicule and abuse. Time, the great healer, however, has altered all this, and nowadays the wheelman, and even the wheelwoman, rationally or irrationally dressed, passes to and fro among the crowd quite unnoticed and unmolested.

In very recent times, what the cycle was to the "man in the street" sixteen or eighteen years ago, a butt for his wit and satire, the hand camera has become. There is a business-like air about the proceedings of a photographer who photographs by means of a stand camera in the streets of a large town with which the employment of a hand camera does not seem invested, and, indeed, we may take it that, except in comparatively unfrequented and quiet byways, stand camera work, *en plein jour*, is not much indulged in except by those who have a business, or at any rate, a well-defined end in view. Hence it is that the photographer of this kind is usually regarded with a certain amount of seriousness, which absolves him from the disconcerting pleasantries to which the carrier of a hand camera is so often subjected.

It took some time to indoctrinate the mass of the general public with the powers and potentialities of the hand camera; but, nowadays, everybody down to the small denizens of the courts and alleys is thoroughly well acquainted with the uses of the "little black box," or whatever outer appearance the hand camera may take, which is so familiar an object in somebody's hands wherever one now travels. The "detective" character of the hand camera has left it for ever in so far as its concealment from general observation is concerned, and we may, in the same connexion, be permitted to hope that ordinary decency and good feeling also denies its use for "detective" purposes in the hands of inquisitive or irresponsible persons.

Properly to appreciate the degree of curiosity, contempt, amusement, vanity, and ribaldry which the hand camera is capable of exciting among the populace, one has to arm one'sself with one of those instruments, and take a leisurely stroll about the more crowded portions of the city, with the view of securing a few photographic mementoes of life as it is lived in the streets. Setting aside the fact of the innumerable subjects which readily present themselves for illustration, and which in themselves show well-defined phases of local life and character, the infinite variety of remarks and comments with which the hand camerist will be greeted will constitute an experience, perhaps not entirely pleasurable, of a novel and instructive character, which the student of manners should not by any means miss. On a recent expedition of this kind we were the unmoved recipients of the cachinnatory comments of giggling hoydens who wanted "to be took;" cabby hoped we "wouldn't break" it; an itinerant photographer outside the gates of a park asked us if we thought a hand camera "would do him a bit of good" if he adopted the use of one; hobbledehoys hoped it would'nt "go off;" buxom matrons asked us to take them just as they were for ninepence; and so on. It is astonishing what piquancy and zest this adds to a hand-camera stroll through the streets.

We alluded just now to the utility of the hand camera for securing records of local life and character. Here are some of the scenes we encountered on the occasion referred to in the preceding paragraph, premising that the time was Sunday afternoon, and the scene of our peregrinations a riverside suburb:—Groups of men assembled after the public-houses were closed; youths round an icecream stall; entrance to a park, showing crowds of children round the fruit stalls; the street preacher, with a comparatively small audience; the itinerant photographer at work; 'Arry and Co. mismanaging a small row boat; mob orators in a park; excursionists *en route*, by steamer, to a river resort; old men enjoying forty winks on seats in the park; paterfamilias (of the ouvrier order), accompanied by his wife and little ones, out for a walk; Edwin and Angelina; loudly dressed and mannered youths in their Sunday best, and accompanied by evil-smelling cigars; a park thronged with men, women, and children; listening to the band. Here we have a series of subjects illustrating how life is passed on Sunday afternoon in one quarter of the great city, and to illustrate which, by means of photography, is only practicable with a hand camera. Does not this list suggest almost limitless possibilities for the hand camera in the same direction, of which our amateur friends could easily take advantage, always, as we said a few weeks ago, working with a definite purpose?

Doubtless the hand camera will ultimately live down the satire and the ridicule of the thoughtless public, and be one day looked upon quite seriously. Its novelty is bound to wear off, although not much harm will be done if it does not. Our only fear, however, is that the cheap jocularity of the

"common" people may send the hand camera out of favour with fashionable "button-pressers." Calamitous as this would be, it is eclipsed by the mournful knowledge that the comic artist and the funny writer would lose inspiration for no end of excruciating pictures and copy at the expense of the hand camera and its "victims." This would indeed be a terrible misfortune, but somehow we think we should survive it, and that the hand camera would also still have an undiminished career of usefulness before it.

The Paris Exposition of 1900.—It is intended to have an attraction or a centre, about which all the rest will hang as it were. A multitude of suggestions have been made as to what form it should take, that of most interest to photographers being the proposal that a handsome prize should be offered for either a successful mode of transmitting the effects of light to a distance or the economical production of chromo-photographs upon paper.

Naturalists and Photography.—According to an evening contemporary, the Naturalists' Field Club have decided to make a special feature of photography, the object being to obtain a collection of negatives illustrating wild birds' nests, coral lines, seaweeds, &c. We were under the impression that the Naturalist' Fields Club had already made a feature of photography. Anyhow, we know that many of its members have been no novices in photography for many years past, also that the objects referred to have received particular attention at their hands.

Photographic Exhibition at the Imperial Institute.—It is said that next year at the Imperial Institute a photographic exhibition on a somewhat large and comprehensive scale will be attempted. It will be open, we gather, during the greater part of the year, and, besides including a display of photographs by the various processes, will illustrate their methods of production; the apparatus, &c., &c. Photography nowadays embraces a wide field, and such an exhibition as that on the lines here indicated should prove both instructive and interesting.

The Wellman Polar Expedition.—At last we have some reliable information as to this expedition. As some expected it would before it started, it has met with disaster. The ship, the *Ragnvald Jarl*, was crushed in the ice and totally lost. It is reported, however, "that some of the stores and equipment are saved." In this, as in all Polar Expeditions now, photography was to be largely to the fore, and, as we said a little while ago, it will be interesting to learn how dry plates and films will behave under extreme conditions of cold. As the report says that some of the ship's stores and equipment were saved, it is to be hoped that we may have this opportunity when the expedition returns.

Malformed Photographs.—The great aim of the manufacturer and user of quick-exposing shutters is to so arrange them that no distortion of the image is produced. In a recent number of *La Nature*, however, the possibility of making distorted pictures is taken advantage of in describing a method of making photographic drolleries by its means. A special shutter arrangement is contrived and illustrated to print from a negative, through which, and by means of altering the direction and rapidity with which the shutter slit and the negative pass one another, pictures of any amount of horizontal, vertical, or curvilinear distortion or stretching are produced. We scarcely see a possibility of practical use for this apparatus, and English photographers are exercised enough in their minds to prevent such effects, which already are too frequently in evidence through shrinking of the paper alone, the results of this shrinking, especially when the photographs are mounted wet, being sometimes so great as to deprive the pictures of all value as likenesses.

Photographs of Family Jewels.—The recent robbery valuable jewellery from the Princess Soltykoff recalls to mind suggestion we made some time ago, namely, that valuable collectio of family jewels should be photographed. Then the picture wou be available for the service of the police in the event of their bei stolen, as in the present instance. Photographs, even when repr duced in the crude form seen on some police bills, would be of far mo service than the written descriptions now being circulated. It is qui conceivable, however, that the jewellery has, ere this, been mu transformed in appearance. At the time we made the suggestion was hinted that it might be worth the while of enterprising phot graphers to publish a collection of photographs of well-known fami jewels and heirlooms; for there is very little doubt they woul command a tolerably good sale in the fashionable world. Tl leading jewellers now, almost invariably, have any special goods th may make photographed before they are delivered to the customer.

Caution to Photographic Tourists Abroad.—As t touring season is now on, it will be well to once more caution tho on photography bent how they proceed in the neighbourhood fortifications, more particularly after the unpleasant experience two French tourists one day last week at Metz. It appears that th two gentlemen hired a cab, and afterwards a dispute—a no very u common occurrence—arose about the fare. In the end, Jehu hande the tourists over to the police, alleging that they were French spie who had examined the fortress through their field glasses. The were taken to the station, where they had to pass an unpleasan night. In the morning, however, they were liberated by order of th Kreis-Director. If the tourists had photographic apparatus in thei possession, there is little question that they would not have got of so easily, even if it had not been used in the neighbourhood. W again advise English photographic tourists on the Continent to b provided with passports. They are seldom required, but, when the are, they prove of great service. A Foreign Office passport cost but a couple of shillings, is easily obtained—simply by applicatio on a proper form—and will do for all time. As a piece of furthe advice, after the affair just referred to, do not fall out with an un scrupulous Jehu.

Society Competitions.—When Societies institute compe titions, as one of the London societies has done lately, the promoter should lay down such conditions that the members, or such as choos to enter the lists, can compete on equal terms. In the competitio referred to, the subject to be reproduced as a negative suitable fo photo-mechanical work was the front page of this JOURNAL. Thos knowing anything of the technics of printing know quite well tha there is a very great variation in the quality of different impression as they come from the printing machine, some being much more "solid" than others, and therefore much better adapted for copyin for the object in question than the more "rotten" ones. Th Society did not seem to realise this until the competing negatives were shown, and the matter pointed out, when, of course, the competition was rendered futile. Many not versed in the subject would be surprised at the difference between two prints from the same forme, equal in inking, but made on different sides of the same paper. For a competition of this kind to be of any value, the negatives must be made from the same impression, whatever it may be, as the Society has now arranged to be done in its next competition. Competitions of this kind are healthy as well as instructive.

The Effect of Light upon the Eye.—We have on former occasions pointed out the dazzling effect of light upon the eye, and its resulting effect in disabling that organ from performing its function with due delicacy in the process of development. Dr. Mackay, of the Royal Infirmary, Edinburgh, has recently published a pamphlet dealing with blinking of the retina by direct sunlight. Of course, the two cases are dissimilar, though perhaps only in degree, and it may be as well to call attention to some of his remarks, especially as photography forms such a perfect, and indeed superior, substitute for eyework. He says, for example, that, during

artial solar eclipses, amateur astronomers, and indeed sometimes xperienced but incautious workers, make their observations with ıch want of care as to cause partial blindness. The annals of ıedicine contain but few records of this sort; but, during the sun clipses of 1890–91, which were both visible in Edinburgh, he came ıto contact with seven cases of injury from this cause. The atients suffered from impairment of visual acuteness, and, to most f them, dark spots, sometimes fixed, and in others violently oscillating, ere produced in their fields of vision. Dr. Mackay says that re-overy, even in cases of only slight failure for test-type, is exceptional. Ve do not wish to pose as alarmists; but, seeing that photography f all other pursuits exposes the eye in studio, dark room, or re-ouching work, to violent and considerable strains, it is most desir-ble that every busy worker, when experiencing eye trouble, should ıot neglect it, but at once consult an ophthalmic surgeon.

"Cheapness."—One of the members of the Photographic Club struck an important chord the other night, and, according to the report of the meeting, as given last week, all present agreed with him, "that the present rage for cheapness was the sole cause of so many complaints of fading of prints," &c. Without endorsing this to the full extent, one must admit that the rush after cheapness—or rather low prices, for there is a wide distinction between the two—has had much to do with the fugitiveness of modern photographs. But where is a remedy? So long as the public are offered photographs at a low price, so long will they continue to have them, if they answer their immediate purpose. So long as dealers, enlargers, and those who supply the trade generally offer photographers their goods at a low price, so long will they continue to purchase in the "cheapest" market. We were recently told of some West-end establishments, who do the highest class work, and obtain the highest prices for it, yet use nearly the lowest-priced foreign mounts in the market. Complaint is universal of fading enlargements. Carbon and platinotype enlargements are permanent, but they, to a great extent, have been supplanted by gelatino-bromide pictures. Without expressing any opinion as to the permanence or otherwise of pictures by this process, we unhesitatingly say that the prices at which some houses turn them out will not pay if the requisite attention and time are bestowed upon the work to render it as stable as the process is capable of yielding; but, as we have said before, where is the remedy for this so-called cheapness? It is simply a question of demand and supply; or, perhaps, it would be more correct to say, offer and acceptance.

DUBLIN CONVENTION NOTES.—III.

(*By our Special Correspondent.*)

Seriously, is not the Convention group a great farce? Time was when every member made it a religious duty to be present when the exposure was to be made, and a few apparently still adhere to the old custom. Hence, on looking over a collection of these annual groups, we see year after year many of the same old faces. But do these groups represent the Convention as it really exists? We all know that the numerical strength of the Convention this year was 270, more or less, while equally we all know that the group is represented by little over 100. Here, then, are over 150 members who are not in the group, and how is this to be accounted for?

Had the absentees no ambition to be portrayed in such company? Were they too busy with their ordinary avocations to spare the time to be present? Had they been sampling the native liquor of the country thus early in the day, and been by it placed *hors de combat?*—a fate which is recorded of one member on the day of the Lord Mayor's garden party, and whose misfortune, or insult, was generously condoned by his Lordship, who had him put to bed! Be the cause what it may, not one half of the members elected to have themselves placed on record, as it were, in the official group.

There appears to exist among some of the members, who, if they attend the Annual Meeting at all do so with some difficulty, a strong desire that the meeting should take place in August rather than in July. Men engaged in business (not necessarily photographers) allege that they can manage to get away much better in August than at any other time. "Besides," say some of them, with an ill-concealed chuckle—that kind of chuckle which is always on tap when elicited by the misfortunes of another—"July is always a wet month, which accounts for the bad weather invariably experienced during Convention week. Make it a month later and it will be sure to be dry." And a rain report of a well-known meteorological society was presented to me in support of this view, which was based upon the observations of, I think, fifty years. I mention this as a possible factor in determining the date of the next meeting by the Council.

Talking of rain, it certainly *did* rain during Convention week—a good deal more than was necessary to establish the pluvial character of Ireland, some of us thought. But there was consolation for us in the fact, which we ascertained from the morning papers, that, if Jupiter Pluvius was chastising us with whips, he was doing the same for the stay-at-homes with scorpions. The sprinklings we sometimes had were occasionally relieved by lovely bright weather; and, as in a well-painted picture, the shadows are necessary to enhance the value and beauty of the lights, so did we the more enjoy the wondrously lovely Irish scenery during the bright intervals. Some one ventured in my hearing to animadvert upon this phase of insular meteorology to a son of the soil, who promptly explained that it was love for England that caused it. "We catch the storms and rains as they arrive from the Atlantic and prevent them from reaching England."

Are photographers artists? This vexed question is settled at last, and by an Irish peasant boy. My companion and I one evening walked from the Eccles Hotel at Glengariff up to the little village of that name, to ascertain if it was really correct that the village consisted of only eight houses, and six of them were licensed to sell drink—a true statement—when an intelligent boy, a native, hailed us with "A fine evening, sirs!" Considering that we were both closely under umbrellas at the moment in consequence of what we looked upon as a drizzling rain, it spoke ominously for the normal state of the weather there. We were comforted with the explanation that it was very often worse, sometimes better, than at present. We were guided by him to Cromwell's Bridge, a singularly fine, although now broken-down, ruined bridge, built by the army of the Protector. Resolving to return early next morning to capture this unusually fine archæological remain, my friend casually observed to the boy, "I suppose there are a great number of artists who come here to see this bridge?" "*No,*" said our small guide, "*there are only very few artists that come here, but there are plenty of photographers!*" Well, whether my friend and I are entitled to rank as artists or as photographers, it is consoling to our lacerated feelings to know that our pictorial attack on the bridge and its vicinity the following morning has resulted in our capture of several lovely negatives.

THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

We have received the following communication from Mr. Chapman Jones, Honorary Secretary of the Photographic Society of Great Britain:—

"*To the Editor of* The British Journal of Photography.

"Sir,—I beg to inform you that the President of this Society has received a communication from the Secretary of State to the effect that Her Majesty the Queen has been graciously pleased to command that this Society shall in future be called 'The Royal Photographic Society of Great Britain.'

"I am, Sir, your obedient servant,

"Chapman Jones, *Hon. Sec.*

"*Photographic Society of Great Britain, 50, Great Russell-street, W.C., August 7th,* 1894."

THE PROGRESS OF PHOTOGRAPHIC DISCOVERY.

I.—Introductory.

Amongst the ever-increasing band of workers in photography at the present day there must be many who, at one time or another, make valuable experiments without knowing it, as well as others who do not regard their observations as of sufficient importance to warrant further investigation.

This state of things has marked the progress of photographic discovery from its beginning, even from the day when Fabricius, in the sixteenth century, noticed that horn silver gradually darkened when removed from the mines of Freiburg, and, failing to follow up his important observation, left it to Schulze, a hundred years afterwards, to show that light was the cause of the phenomenon, and thus to sow the germ from which photography has sprung. Throughout the whole history of the development of photographic knowledge the same story is repeated. Small discoveries are made and lie fallow for years, until a genius comes and proclaims their true signification and importance. In photography, perhaps more than in any other science, it is the small discoveries which suggest the great ones, and which gradually contribute to the knowledge of a mighty truth.

It has been maintained "that photography has suffered in its scientific development by the hap-hazard experimenting of its unscientific devotees." "But there is no experiment," said Abney, "properly carried out, with a set object in view, which is not worthy of record. The most trivial deviation from the expected results of an experiment often causes some new line of thought to be taken up, and may suggest important investigations." It is not that dissatisfaction can be expressed at the rate of progress which photography has made, and indeed is making at the present time; but, in spite of this undoubted rapidity of growth, there must be a feeling in the minds of earnest workers that a great deal of knowledge is in danger of being lost or wasted either through neglect of further investigation or ignorance of its possible importance. There is yet a great deal to be learnt even of the very fundamental facts of the science of photography, and it is probable that, if more were known of the methods by which photography has been built up, and of the deficiencies which still exist in our knowledge, not only would there be more investigators, but there would be less chance of some valuable discovery being passed over or neglected through ignorance of its scientific value. An art of discovery is no more possible in photography than in other branches of science, but, nevertheless, success or failure will depend to a considerable extent upon an intimate acquaintance with the methods employed in research, as illustrated in the history of photographic discovery.

II.—Past and Present Methods of Photographic Discovery.

The popular belief that many important scientific discoveries have been entirely due to accident is erroneous so far as photography is concerned. Daguerre had laboured hard at photographic experiments for several years before the memorable accident occurred whereby he found a developed image produced on some iodised silver plates, placed aside in a cupboard as useless. But even this accident would have yielded no useful results if his scientific instinct had not prompted him to repeat the experiment over and over again, removing the bottles of chemicals one by one from the cupboard until only the dish of mercury remained. Even the great law of gravitation, popularly supposed to have flashed across Newton's mind as he watched the falling apple, cost him sixteen years of patient study and calculation to evolve. But, nevertheless, accidental circumstances may play an important part in hastening a discovery and saving years of fruitless labour. Even if Daguerre had not had the fortunate accident referred to, it is possible that the discovery of the latent image would only have been a little longer delayed, and perhaps Daguerre himself might not have had the credit of finding it out. But, when such a lucky chance happens to an investigator who has laboured long and patiently to find an expected result, it can scarcely be called an accident in the true sense of the term.

In many cases, while searching for one result, another is found of equal or greater value. Crooke's, when searching for selenium, discovered thallium, and Columbus discovered the variation of the magnetic needle when looking for a new continent. The history of photographic discovery would, no doubt, furnish many examples of this kind of accident. Every experiment made for the purpose of testing an hypothesis or investigating unexplained phenomena suggests many other researches, any of which may evolve new and useful facts. When Professor Stromeyer found that the carbonate of zinc manufactured in Hanover had a peculiar yellow colour, he did not rest until he had ascertained its cause, and thereby discovered a new metal, which he called cadmium.

If, then, accident has played but a small part in photographic discovery, it will be useful to illustrate the chief methods which have guided the pioneers of photography in their researches. It would be impossible to describe, in one short article, the origin of each of the great discoveries from which photography has been evolved. In the following summary, therefore, only a few actual examples are given in illustration of the general methods which have been adopted.

1. *By Examining Neglected Truths and Hypotheses.*—Johann Baptist Beccarius, of Turin, for instance, was led by the observations of Fabricius, two hundred years before, on horn silver, to try the effect of light on precipitated silver chloride.

2. *By Investigating Unexplained and Exceptional Phenomena.*—This has always been a most fertile source of discovery. An interesting example is seen in the origin of orthochromatic photography, said to have been due to an accident. Professor H. W. Vogel was performing some experiments in spectrum photography in 1873, and was using some Wortley dry plates. To his surprise, these plates were more sensitive in the green than in the blue rays. Vogel speedily discovered that the cause of this exceptional behaviour was a yellowish pigment which the plates contained, and from this fact gradually worked out the theory of the sensitising action of dyes.

3. *By Examining Neglected Substances and Residues.*—Glauber is said to have made it a rule to examine what other chemists threw away.

4. *By Testing Existing Hypotheses.*—Hypotheses are tentative guesses, and, however much they may conform to the great principles of science, they must not be mistaken for theories. Bacon wisely said that, if a man will be content to begin with doubts, he shall end in certainties. In his examination of Vogel's theory of optical sensitisers, for example, Abney made important researches and valuable discoveries.

5. *By Devising New Experiments.*—The principle of the camera obscura, the forerunner of the photographic camera, was discovered by Baptista Porta in 1560, by means of a hole in the shutter of a darkened room. Kircher afterwards, in 1610, by rearranging Porta's experiment, invented the optical lantern. Newton, again, discovered the composite nature of white light by a new use of the prism, and investigated the colours of thin films by pressing lenses together.

6. *By Modifying the Experiments of Others.*—Scheele discovered that silver nitrate blackened in the violet rays of the spectrum, and Ritter, repeating his experiments in 1801, found the maximum effect occurred in the invisible ultra-violet rays.

7. *By Extending the Researches of Others.*—Nearly all great researches are built up upon the labours of previous investigators. The known forms the foundation from which the unknown is explored. Galileo's telescope, for example, was the result of an extension of the experiments of Lippersley, a Dutch spectacle-maker.

8. *By Subjecting a Series of Substances to Similar Conditions.*—The blackening of silver chloride in sunlight, being a visible effect, was first noticed. The alteration of the bromide and iodide was discovered afterwards. Other substances were soon found to be sensitive to light, and the list is continually increasing. Niepce extended his observations even to mineral resins, and so perfected his heliograph process. Under this head, also, would be placed the discovery of new developing agents, which has been so marked a feature of the last few years.

9. *By Studying the Effect of the Different Forces of Nature in Producing or Modifying Phenomena.*—The early experiments of Moser and Grove show that certain of the photo-chemical effects can also be produced by other forces, such as heat, pressure, and electricity. More lately it has been shown that temperature has an important influence in toning operations and in the sensitiveness of dry plates.

10. *Influence of Time on Phenomena.*—All investigations in length of exposure, permanency of photographs, and ripening of emulsions belong to this class.

11. *Observations of the Effect of Mutual Contact of Substances.*—This is exemplified in the experiments of Vogel, Eder, and Abney on the influence of organic dyes on the sensitiveness of silver compounds to the action of light. A very large number of discoveries throughout the whole range of photographic chemistry illustrate this method.

12. *By Using Instruments of Exceptional Delicacy or Power.*—Innumerable discoveries are due to the use of the spectroscope, microscope, telescope, and other delicate instruments of modern invention.

The above summary can scarcely claim to be exhaustive, for it is impossible to collect details of the methods by which a great many

photographic discoveries of importance have been achieved; but it sufficiently illustrates the principle that method and design play a far more important part in scientific discovery than mere accidental circumstances.

III.—Aids and Obstacles to Photographic Discovery.

To undertake systematic research involves a great sacrifice both of time and money. In most cases it is not remunerative, and the too widespread ignorance of its utility often leads to a discouraging want of appreciation by the world in general. Success also is difficult; and, valuable as negative truths may be, they do not afford an amount of satisfaction to the investigator which is proportionate to the energy consumed. But here, again, it must be repeated, that the history of the evolution of photography shows continually the importance of those small discoveries which are within the reach of every worker who is able to make an experiment and draw an inference. The great naturalist, Buffon, has said that scientific genius is only protracted patience, and even the great Sir Isaac Newton himself modestly maintained that whatever discoveries he had made were due more to patient attention than to any other talent. Neither is abstruse knowledge indispensable, although, undoubtedly, a powerful aid. It is said that Priestly, the discoverer of oxygen, was not only a self-taught man, but was unable even to make a chemical analysis properly. In research, as in most worldly matters, perseverance and industry have always been more powerful in the long run than the possession of exceptional ability.

It seems a strange thing, therefore, that more is not done to stimulate and guide research by the innumerable photographic societies which have sprung up all over the world. Perhaps at some future day the Photographic Convention may be in a position to exert, with respect to photography, the same influence which the British Association does with respect to science generally. The functions of such a central body should include the endowment of photographic research, the appointment of committees to draw up annual reports of progress in important lines of investigation, and the publication of such periodical information as would facilitate progress, and prevent the rediscovery of facts already known. In this direction the photographic press continues to afford an assistance which can scarcely be exaggerated.

Perhaps the greatest obstacle to the progress of every science is error. Errors and fallacies surround the investigator on all sides, and a few prominent instances in photography will illustrate their great importance. One of the most dangerous and insidious forms of error is the mistaking of mere coincidences for cause and effect. For example, some high authorities are of opinion that the photochromatic effects which can be obtained on silver chloride are mere accidental coincidences; that is to say, that the different colours of the spectrum, acting differently on the chloride, produce reduction products, which happen to be approximately coloured like the colours which produce them. If this is really the case, much valuable labour has been lost, from the time of Seebeck's original observation in 1810 to the present day, in the effort to make this accidental result the basis of photochromy. Another common error is to attempt to explain unusual phenomena either by a still more obscure cause, or to attribute them to some occult or mysterious influence. Thus, when first the blackening of horn silver was noticed by early alchemists, it was explained as a case of the transmutation of metals, a striking instance of the logical fallacy of *ignotum per ignotius*. Fallacious reasoning has been conspicuous also in some of the attempts which have been made to determine the composition of the blackened chloride. The compound loses chlorine, they say; therefore it must be either reduced to a subchloride or to the metallic state. It is not reduced to the metallic state, therefore it is subchloride. These few examples are enough to show the dangers into which investigators may easily fall. Even common sense is often so deceptive that it has been characterised as the name under which men deify their ignorance.

There is one class of investigators to whom photography owes but little of its progress. In these days of commercial competition, it is not to be wondered at that certain discoveries should be kept secret for the sake of private gain, or that their use should be restricted by prohibitive patents. No one can deny to a discoverer the right to make what profit he can out of the fruits of his labour. Fortunately, however, such monopolists of knowledge are only a temporary check upon progress, and are quite outnumbered by those who give their results freely to the world, content with the pleasure of discovery and the honour of contributing to the development of their art.

IV.—Fields Imperfectly Explored.

Many are, doubtless, deterred from attempting investigations, either on account of ignorance of proper subjects, of what has been done and what wants doing, or from a belief that the field is exhausted, and that nothing more remains to be discovered. To such is offered the following imperfect but yet formidable list of questions in photographic chemistry, about which our knowledge is still either incomplete or wanting altogether.

The exact composition of the photo-reduction product of haloid silver salts is even yet a matter of doubt and perplexity. The view that it is a subchloride is perhaps gradually losing ground in favour of the oxychloride theory. Any observations bearing upon this difficult question should be most carefully noted. Carey Lea's experiments on photo salts should be studied and extended with the object of confirming the hypothesis of the similarity in composition between the latent image and the darkened product formed by the direct action of light upon silver chloride. In connexion with this complicated problem, the phenomena of reversal and solarisation afford an infinite number of suggestions for future research.

When silver chloride is exposed to light in the presence of silver nitrate, a strongly acid solution is formed, owing to the presence of free nitric acid. Meldola suggests that this experiment should be performed quantitatively, to ascertain if the chemical reaction is correctly represented by the equation—

$$3Cl_2 + 6AgNO_3 + 3H_2O = 5AgCl + AgClO_3 + 6HNO_3.$$

Any investigation on the fading or destruction of the latent image, or such phenomena as the bleaching of darkened silver chloride by the action of potassium iodide in sunlight, may throw light upon the constitution of the photo-reduction product itself. What is the precise nature of the compound formed by mercury and the reduction product of silver iodide in the Daguerreotype process? Is it a chemical or physical action? In connexion with this subject the influence of water vapour as a developer, and the probable existence of other developing agents should be investigated.

In the development of the latent image, why does the silver attach itself to the reduction product only? In the wet-plate process, is the invisible image actually reduced by the ferrous sulphate? or does it simply attach the nascent silver produced by the reaction of ferrous sulphate and silver nitrate as represented in the equation—

$$6\,FeSO_4 + 6\,AgNO_3 = 2\,Fe_2(SO_4)_3 + Fe_2(NO_3)_6 + 3\,Ag_2\,?$$

Or is it a case of electro-deposition, as suggested by the experiments of Lermontoff?

What is the precise action of potassium bromide as a restrainer? Is it due to the formation of a more stable double bromide? If this is the explanation, it might be possible to isolate this double bromide. Again, what is the cause of the accelerating action of sodium thiosulphate in presence of the ferrous-oxalate developer? Does the thiosulphate reduce the ferric oxalate to ferrous oxalate again, as suggested by the equation—

$$Fe_2(C_2O_4)_3 + Na_2S_2O_3 = 2\,FeC_2O_4 + Na_2C_2O_4 + Na_2S_4O_6\,?$$

In alkaline development is there any electrolytic action between the reduced silver and the silver bromide in contact with it, as indicated by the action of metallic silver particles on the sensitive film in presence of a developer.

Another obscure problem requiring explanation is the cause of the developable image which can be produced by pressure marks upon dry plates. The influence of pressure upon chemical actions in general would be a fertile field for investigation.

It is unfortunate that the solution of many of the above questions depends to some extent upon a knowledge of the exact molecular condition of the haloid silver salt in a gelatine emulsion, about which very little is known, many points in the chemistry of gelatine itself being still very obscure. This is more especially the case as regards the products of the oxidation of gelatine by the action of such oxidising agents as potassium dichromate in sunlight.

The theory of solarisation remains incomplete in the absence of any knowledge of the action of free halogens upon such organic sensitisers as tannin and gelatine, or of the function of the developer in solarisation phenomena.

In orthochromatic photography we require to know more of the nature of the photo-reduction products of eosine, erythrosine, and cyanine in the presence of light and air. Before it can be definitely settled whether the action of dyes is of a physical or chemical nature it will be necessary also to study the connexion between the specific absorption of the dye and its sensitising action, the connexion between the chemical constitution of the dye and its sensitising action, and any influence exerted by its fluorescent properties.

Coming to positive printing processes, we find the chemistry of

albumen still imperfectly known. It is not even clear whether or not it has the definite chemical composition indicated by Lieberkühn's formula. Without this knowledge it is almost impossible to state the composition of the compound formed when a solution of a silver salt is added to albumen, or the exact nature of the silver image on albumenised paper. Are the reduction products of silver albumenate the organic analogues of the haloid photo salts? In connexion with this question, the experiment of Carey Lea on image transference should be studied, and, if possible, extended. Any experiments also, bearing upon the production of platinum prints by direct reduction of platinous salts in sunlight, would be of extreme interest, and might lead to valuable results.

In regard to colour photography nearly everything still remains to be done. The chromatic effects obtainable on silver chloride have never ceased to be the subject of experimental research, but without any material advance having so far been made. The new departure recently discovered by Lippmann, in which coloured images are produced by interference figures, the image being made up of layers of deposit separated by the half wave-length of the colour which produced them, offers a fresh field for the experimentalist, of a more promising nature. But there is great need of a more complete investigation of the chemical nature of the coloured reduction products of silver chloride, to test the hypothesis that their close agreement with the colours of the spectrum is, after all, only a remarkable coincidence.

The above list is of necessity a mere outline of some of the more important defects in chemical knowledge alone, without reference to the innumerable advances that may be made in the future in the application of known facts to processes of various kinds. They have been selected chiefly on account of their importance in connexion with the proper explanation of the fundamental facts of photographic chemistry. No more useful work could be undertaken than the compilation of a complete list of suggestions for research in every known branch of photography.

V.—Conclusion.

After such an enumeration of the deficiencies which still exist in what may be called a single department of photographic knowledge, it may reasonably be asked what assistance can be expected from photographers unskilled in research towards the solution of problems which have baffled the ingenuity of experts? The difficulty in solving a scientific problem, however, may be due to several causes, of which the most important is the question of *ripeness*. There is a certain necessary chronological order in all discoveries; each is dependent upon previously existing knowledge. If one link in the chain of knowledge is wanting, the discovery is unripe, the solution is impossible. It is in furnishing these missing links that assistance may be given by any worker in photography who may chance to come across their path. The value of the smallest observation cannot be accurately estimated in advance. For example, when Scheele, in 1777, discovered that silver chloride loses chlorine in sunlight, he could scarcely foresee that upon this effect depends the whole theory of the action of sensitisers. To withhold the knowledge of new facts, therefore, may seriously retard the progress of discovery. For years those early pioneers of photography, Wedgewood and Davey, were pining for some means of fixing the photographic image. From 1802 until 1839 no better agent than common salt could be found for this purpose; and yet Sir J. Herschel had known of the solvent action of thiosulphate upon silver salts since 1819, but did not publish this invaluable information until twenty years afterwards.

We see, therefore, that a problem, which to-day may seem hopelessly obscure, may assume quite another aspect to-morrow, because of some apparently small discovery in perhaps some collateral branch of knowledge. It is the expert who is specially in danger of wasting valuable time in endeavouring to elucidate unripe subjects, and as the scope of his investigation increases the more does he trust to the rank and file to aid him in his difficulties by recording peculiar facts, following them up, if necessary, with fresh experiments, and thus to contribute to the growth of knowledge. The Gordian knots which check the progress of science cannot be cut, they must be patiently unravelled.

There yet remains to be written the real *novum organum*, which shall reduce all intellects to a level, and make discovery simply a matter of time and labour; but in the meantime it is within the power of every one to cultivate those habits of intelligent experiment, careful observation, and logical inference which lie at the very foundation of all research.

J. Vincent Elsden.

COLOUR PHOTOGRAPHY.

Many years ago, noticing the iridescence produced by a small quantity of greasy matter floating on the surface of water, and the gradual disappearance of it by the addition of larger quantities, it occurred to me that colour photography might perhaps be in the direction of superposed films of different thicknesses, or rather thinnesses, although how they were to be produced was beyond me; it remained an idea, nothing more; the elements seemed there, but that was all. Our knowledge of methods of securing coloured positives have advanced since then, and, to a certain degree, photography in natural colours has become an accomplished fact. Excellent results have been achieved by the triple system of coloured screens, and negatives followed by three printings in corresponding colours superposed on each other. There is, however, a want of transparency in pictures so produced when compared with the image on the focussing screen.

I would suggest that suitably coloured *films of gelatine*, produced by the aforesaid triple negatives, are superposed on each other, and the result examined as a transparency or laid down on a white support, as opal or paper. Such compound films could be utilised for lantern projections. I am not aware that this plan has either been suggested or put in practice before, although it may have been amidst the thousands of experiments that have been made to secure a brilliant, naturally coloured picture.

It seems to me—not being a worker in this direction—that thin films of gelatine, dyed of the right tints of red, blue, and green, should give a particularly brilliant result, used in this manner. Any way, if the suggestion is stale, no harm is done; if new, it may lead to improved results. Edward Dunmore.

THE TRANSFERENCE AND ENLARGEMENT OF NEGATIVE FILMS.

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Adverting briefly to my article on the above subject recently published, it will quickly be observed by those who make trials that there is considerable difference in the toughness of films; that, unless unavoidable, *handling* of the disengaged films should not be attempted. On removal from the glass it may be lifted out, and plunged into the washing water; I have used a large spoon perforated like a "fish slice," and this will answer for the operations all through, but if kept opened out it will be better. A light frame of wood over which is stretched coarse muslin, then weighted to keep it at the bottom of the dish, should be made, or if at hand stout german silver wire may be bent to form a rectangle, and muslin stretched over; a few of these frames of various sizes will be very useful, making use of them to collect the film and transfer it from one solution to the other.

No doubt, the more quickly we get the transfer made the better, if only to avoid risk of fracture; but, given a tough film, one which promises well, I certainly think intensification is best *before re*-mounting. It is only fair to say, however, that the film may often be intensified after mounting (and drying) with complete success, *i.e.*, without leaving the glass.

If the film be *reversed*, some little difficulty may be met with in the mounting; that is to say, the film will have a tendency to stick to the cloth if the latter be not kept quite damp or even wet. The under side of film next the glass is very much more adherent than that which has been directly exposed to light and treated, hence the need of caution.

I may remind professionals that a new power is in their hands which may at times prove a source of profit. A few weeks ago I had occasion to take a friendly group, and exposed, as I invariably do in such cases, two (half) plates, intending to print from the better one. They were both good and satisfactory, and from one was got a cabinet and from the other a whole-plate print, much to the surprise of an amateur friend, who could not understand how I took a negative $8\frac{1}{2} \times 6\frac{1}{2}$, in a half-plate camera. Now, I think, when taking a small group, we might find it pay to take two plates, submit a proof of the size required, and book the order, then from the other negative make an enlargement, as described, we shall often get a large negative in every way as good as the smaller, and may possibly sell some copies. We run no risk in money or reputation, and, if a failure, no one is the wiser.

I need hardly remind readers of this Journal that, if any *value* is attached to a negative, it is advisable to make a transparency and enlarge this, and then a negative by contact, or, at any rate, secure a really good print before starting operations. J. Pike.

IMPROVEMENTS IN APPARATUS FOR TESTING GAS CYLINDERS.

The Scotch and Irish Oxygen Company and Mr. H. Brier, of Glasgow, have recently patented some improvements in that type of apparatus used for measuring the expansion, temporary or permanent, of gas cylinders whilst subjected to pressure tests, and known as Brier's testing machine, in which the cylinder to be tested is partially immersed in water within a casing having a stationary head, carrying a fixed inflatable sealing ring of rubber bearing against the side or shoulder of the cylinder to prevent egress of the water, the test being made by measuring the displacement of water due to enlargement of the cylinder on the application of internal pressure.

Such machines, say the patentees, have not hitherto been adapted for testing cylinders, having large ends of different diameters, without undoing the bolts and replacing the stationary head and rubber ring, and, when the bursting of a cylinder under test occurred, the water casing or envelope of the stationary head was liable to become damaged. Under the present invention, such risk and inconveniences are obviated by the provision of removable sealing rings, bearing both against the inner periphery of the water casing or envelope, and against the outer periphery of the cylinder or its neck or shoulder against the pressure pipe used to convey into it the testing fluid under pressure, the sealing rings being easily placed and permitting of the test being applied either to the whole body or part only of the cylinder.

In the accompanying drawings, which illustrate the invention,—

Fig. 1 is a vertical section, and fig. 2 a plan of the improved testing apparatus, showing a cylinder in process of being tested.

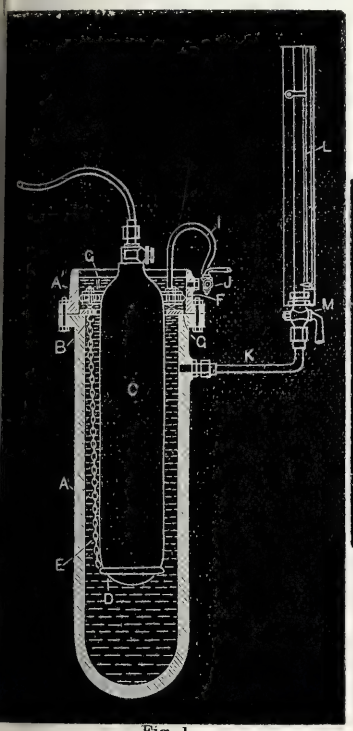


Fig. 1.

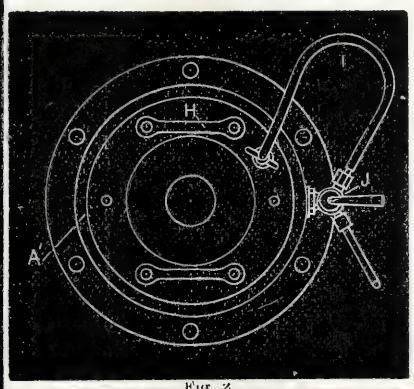


Fig. 2.

Figs. 3 and 4 are respectively a sectional elevation and a sectional plan of the sealing ring to a larger scale.

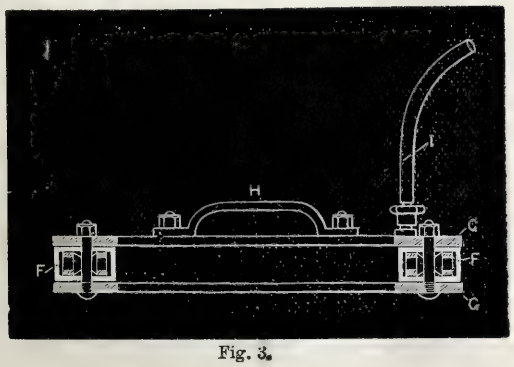


Fig. 3.

Fig. 5 is a vertical section of the head, or upper part, of the water casing, showing the sealing ring applied to the neck of the cylinder, and

Fig. 6 is a similar view, showing the ring applied to the body of a relatively smaller cylinder.

The water casing, A, has bolted to it a head part, A^1, of slightly larger internal diameter than the main body, in order to provide a shoulder, on which rests a perforated guide plate, B, which serves to steady the gas

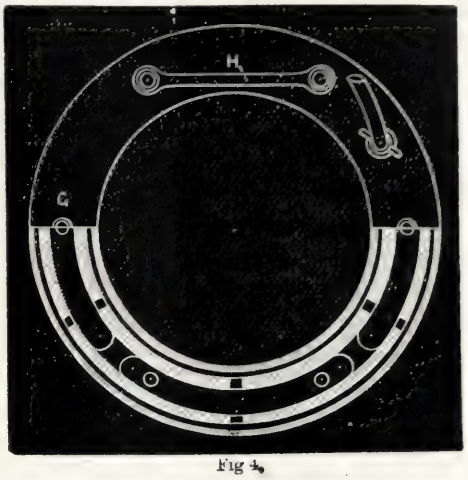


Fig 4.

cylinder, C, passing through an orifice in it, and supported by a cradle, D, and chains, E, attached to the plate, B. The cylinder, if preferred, can be carried on the bottom of the envelope, or, if short, be supported

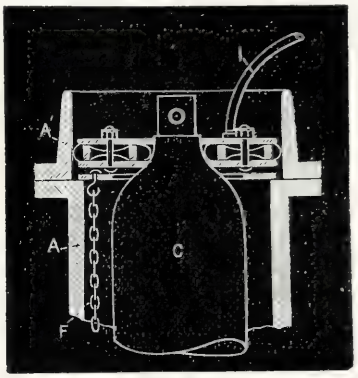


Fig. 5.

by special means. Over this perforated plate is fitted the sealing ring, which is composed of an annular ring, F, of flexible material, such as rubber, which is grasped between two metallic rings, G G, serving to

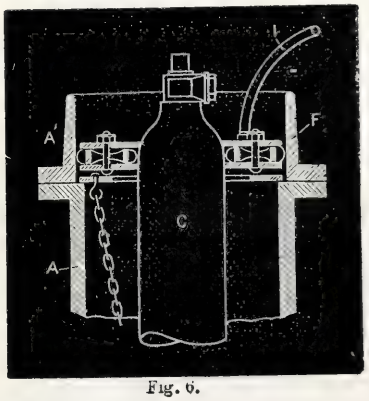


Fig. 6.

confine the flexible ring and keep it in place. An open metallic ring is also placed within the flexible ring, and through it, and the plate bolts are passed to brace the whole together. Handles, H, are also provided on the upper plate for use in lifting out the sealing ring. When placed in position in the water casing, the ring, F, is coupled to a pipe, I, through which water, air, or other fluid under pressure, is admitted to inflate and distend it both outwards and inwards, to bear hard against the internal surface of the head, A^1, and against the outer surface of the cylinder, C, and thereby form a tight joint or seal to prevent egress of water from the casing or envelope, A. The admission of water, which is the fluid used by preference, is controlled by a three-way cock, J, on the pipe, I, which may be turned to discharge the water from the sealing ring into the casing, A, or to lead water from the main direct thereinto when required to make up any loss due to displacement by testing a cylinder of exceptional size.

The usual pipe connexion, K, is provided, leading from the casing, A, to a gauge-glass, L, having an index which shows the amount of displacement of water in the casing A, due to the expansion of the cylinder, C, under the test. A three-way cock, M, is provided on the pipe connexion, K, to permit of discharging the gauge glass and bringing the level of water in it to the zero on the scale.

This apparatus may be used in testing vessels of irregular shape by passing the pressure pipe directly through the side of the envelope or casing, which may then be closed by means of a piston having an inflatable ring around its outer periphery.

The patentees claim: The combination of parts constituting the improved gas cylinder testing apparatus hereinbefore described with reference to the annexed drawings. In apparatus for testing gas cylinders, the annual removable and inflatable ring constructed and applied to seal the water casing or envelope, substantially as described.

Our Editorial Table.

Wratten's Drop Shutter Special Plates.

Of the most recent make of Messrs. Wratten & Wainwright's "Drop Shutter Special Plates," we have lately made a trial in the camera. This particular plate was, we believe, introduced before a taste for phenomenally rapid plates became general, but our experience of the "Drop Shutter" shows it to be, in the camera, quite as fast as other plates that claim to possess a hitherto unobtained degree of rapidity. In addition to this, the "Drop Shutter" plates develop up easily and cleanly, and the quality of the emulsion is singularly fine and homogeneous, having a total absence of the coarseness of grain frequently noticed with rapid plates. For quick work, either in the studio or outdoors, no better plate than Wratten's "Drop Shutter Special" is procurable.

Catalogues Received.

Wratten & Wainwright, 38, Great Queen-street, Long-acre, W.C.—This old-established house has recently issued a new catalogue of photographic apparatus, materials, &c. It extends to over 120 pages, and gives illustrated particulars of complete sets; studio, hand, and tourist cameras; dark tents, lenses, shutters, stands, printing frames, dishes, lamps—in short, the innumerable articles required by photographers in the studio, the field, and the dark room are included in this catalogue, which has evidently been compiled by the light of an extensive practical knowledge of the wants of professional and amateur photographers. About thirty pages are devoted to some eminently useful and well-written hints on development, printing, toning, mounting, and other operations.

T. Aston & Son, 95, Spencer-street, Birmingham.—This catalogue is devoted to a good selection of photographic and optical goods.

"The Adapter."

This title has been conferred upon a simple and useful piece of apparatus. It is a small wooden table a few inches square, which is screwed to the tripod head. A supplemental table sits on it, and by means of parallel strips, like the stand of Mr. Latimer Clark, it is movable from side to side. It is this sliding piece to which the camera—a quarter-plate one—is screwed. To use it, the camera is first moved to one side and an exposure made. The plate is then withdrawn and a fresh one inserted; the camera is moved to the opposite side of the stand and a second exposure made. The result is two dissimilar views of the same subject, and, when turned and suitably mounted, a perfectly stereoscopic picture of any still-life scene will have been obtained. It is made and issued by Mr. Theodore Brown, Salisbury.

Twenty Photographs of the Risen Dead.

By Thomas Slaney Wilmot. London: Simpkin, Marshall, Kent, & Co. Limited.

In this little work, which is dedicated to the Countess of Caithness, we have, besides the twenty psychic photographs that may be considered its *raison-d'être*, fifty-six pages of descriptive text, setting forth the conditions under which each individual photograph was taken. Most of the psychic photographs we recognise as having appeared in the five-guinea work (*Gleams of Light and Glimpses through the Rift*), by the same author, which we noticed a few weeks since. Hence photographers and others interested in occultism have an opportunity, by the expenditure of a few pence (the work is published at a shilling) of obtaining as many psychic photographs as will form a good groundwork for a collection, should such be ultimately decided upon. We learn from the text that these "ghost pictures" have been photographed by a lady who has all her life been a religious teacher. This latter fact would in itself fail to carry conviction to us regarding the genuineness of these productions did we not know otherwise that the lady possessed rare intelligence and honesty. The majority of the twenty photographs are vigorous and sharp, and, it need scarcely be said, replete with interest.

L'Art Photographique Dans Le Paysage.

By A. Horsley Hinton. Translated into French by Hector Colard.

Paris: Gauthier Villars et Fils.

We have always, with great pleasure, perused Mr. Horsley Hinton's papers on the artistic possibilities of photography, together with those in which he discusses the best means of employing the camera and lens, so as to secure effects subservient to the recognised canons of pictorial art. It says much for the estimation in which Mr. Hinton's teachings are held by our French *confrères* that M. Hector Colard, himself a highly endowed photographer, should have translated the above work into French. In a brief preface the author indicates his intention of assisting the young photographer to a proper interpretation of the beauties of nature by means of photography. The book is a clearly expounded and ably written treatise on the principles which govern the production of artistic landscapes by photography. After pointing out the importance attaching to the treatment of the principal object in a view, recommending the subordination of the rest of the view thereto, Mr. Horsley Hinton goes on to analyse the disposition of the principal lines in a picture, the uses and effects of horizontal lines, trees in landscape, the rendering of distance, tone, and aerial perspective, clouds, and finally devotes a chapter to the management of figures. The book, which has a number of good plates emphasising the author's points from Mr. Horsley Hinton's own illustrations, is an excellent one, and, from our knowledge of the present position of French photographic landscape work, should be both useful and welcome to French photographers.

News and Notes.

Messrs. J. & J. Thompson & Co., Limited, Chemists and Druggists, 192, Manchester-street, Oldham, write: "We have pleasure in informing you that we have added a photographic department to our business, and hold a large and varied stock of plates, papers, mounts, sundries, &c., at most reasonable prices. We have also a dark room for plate-changing for our customers' use. We shall endeavour to keep a practical man at each of our establishments, so that amateurs may always be sure of obtaining practical advice from us when required."

Ashton-under-Lyne Photographic Society's Exhibition.—The above Society intends holding their Triennial Exhibition of Photography in all its Branches from November 12 to 17 next. There will be no competitions, and consequently they offer no prizes. The Society will, however, be pleased to pay the carriage of all pictures, &c., to and from the Exhibition, provided they know beforehand what is being sent, and that the same has been accepted by the Committee. The Exhibition will not only be of pictures by some of the best workers of the day, but will also include the different processes and uses to which photography has been applied. With this object in view, lectures, demonstrations, &c., are being arranged to be given every evening during the week the Exhibition remains open. The Secretary (Mr. Robert T. Marsland, 24, Park-parade, Ashton-under-Lyne) will be glad to give any information respecting same, and he will be happy to receive offers of pictures on loan as early as possible.

Messrs. Fuerst Brothers write: "In view of the great difference of opinion which still exists in this country as to the kind of plates to be used for obtaining the true relative colour values, we believe it will be of general interest to the photographic world to have this question settled, and, although no doubt exists in our own mind that ordinary plates cannot reproduce the relative colour values, even when a screen is used, in the same way as orthochromatic plates can, we have decided to offer prizes, amounting to 35*l.*, for the best reproductions of two chromo-lithographs (which will be supplied by us), open to any English commercial plates, and this sum will be increased to 50*l.* if the best reproductions are obtained on Lumière's plates, lately put on the market by us. The following gentlemen have kindly consented to become the Judges in this competition:—Captain Abney, Messrs. C. H. Bothamley and Andrew Pringle. They will determine the results arrived at, and we will communicate same in due course."

"Most of us," says *Dry Plates*, which we learn will in future be issued quarterly, "are picture-hunting now, with a view, perhaps, to competitions or exhibitions, public or private. Let none of us forget that the mere snapping of a shutter and pouring developer on a plate does not make a picture. There must be care and thought. Any place won't do to take a photograph from.

There is one spot from which the object or objects will look best; find that if you can. Before making your exposure, note carefully the speed of the plate, the size of your stop, the time of day, the developer you intend to use. Such advice seems trite, yet, if it were remembered, the failures would be the few, instead of the many, as at present. Whist never forgives, they say; photography does, evidently, else many who in their early days neglected such simple rules as those stated above would still be spoiling plates. We quote elsewhere some examples of beginners' folly; Mrs. Tamkin, who has just called at our office, supplies us with another. That estimable lady burst upon us with the exclamation, 'Hass! that's what I says 'e was! A feller comes to our place yesterday and says 'e wants to develop some plates to see 'ow 'e was a-gettin' on; 'e said would I mind comin' inter the dark room with 'em as 'e was only a beginner. My ole man 'ad a silly day, so in I goes. "Wat's that mess on yer plates?" says I. "Backin," says 'e; "they said you should use it for hintearyers." "Why, you've put it on the films," says I. 'E didn't know no better, poor fool, so I says, "Put 'em down the sink;" then I asked 'im, 'Ad 'e got any as 'e 'adn't backed or fronted, and 'e give me one. I powered on the developer, and the thing come up that fuzzy, enough to give you the trembles, and then 'e told me 'e'd bein taking hintearyears with a 'and camera, a 'oldin' on it in 'is 'and for a quarter-'our's exposure. I says, "Hass!" And so say all of us, but there are a good many like him.

PHOTOGRAPHS OF STARS, STAR CLUSTERS, AND NEBULÆ.—Dr. Roberts has made a most handsome present to the astronomical world by the publication of this series of fifty-one quarto reproductions of astronomical photographs, taken with his twenty-inch silver-on-glass reflector. The volume forms by far the most valuable atlas of astronomical photography which has yet been published. In the introduction Dr. Roberts gives an account of some of the difficulties which have been encountered in keeping the mirror accurately fixed upon the objects photographed as they are carried round in the heavens by the earth's rotation, and of the methods which have been devised by himself and by Sir Howard Grubb for overcoming these difficulties. It is impossible to firmly fix the speculum of a reflecting telescope in its cell. If the speculum is tightly gripped, it is distorted, and the definition is spoilt; consequently a little play must always be allowed, and, in the course of exposures lasting for several hours, as the position of the telescope materially changes with respect to the horizon, the speculum tends to shift in the telescope tube. These shifts have to be carefully watched for and guarded against, for if the clock motion were ever so accurate they would produce an apparent shift of the star images on the sensitive plate. Dr. Roberts's method of detecting such small shiftings of position of the mirror is to make use of a small telescope directed through a hole, pierced at the centre of the mirror and its cell, towards a silvered plane fixed to the slide which carries the sensitive plate. The image of a star can thus be brought to the centre of cross wires in the little collimating telescope, and any shift of the speculum relative to the sensitive plate can be detected and allowed for. The equable driving of his clock motion is also controlled by a refractor of seven inches aperture, mounted on the declination axis which carries the reflecting telescope. Very good photographs of the interior and exterior of Dr. Roberts' observatory at Crowborough are given, which will no doubt add to the interest of the volume to the general public who are not familiar with observatory details. It is impossible in a short notice adequately to refer to the magnificent series of astronomical photographs contained in this volume. The reproduction of Dr. Roberts's classical photographs of the great Andromeda nebula and of the Orion nebula are excellent, but the chief interest of the volume lies in the number of photographs of comparatively small nebulæ and clusters which are here published for the first time.—*Knowledge.*

PHOTOGRAPHY IN NEW ZEALAND.—We have solicited, says *Sharland's New Zealand Photographer*, from some professional photographers in New Zealand their opinions in the present tension in the trade, and from their replies we extract the following:—"I was for six years all-round man for an eminent photographer in the South, and I used to draw four pounds a week, beginning work at nine and knocking off at five; now, since I have been working for myself, I begin at daylight and don't get finished when it's dark, having to mount and enamel in the evening. My wife and my son and daughter give their time with me to the business, and together we do not make more than half what I used to earn in the good old times. I never thought it would come down to this."

RECENT PATENTS.

PATENTS COMPLETED.

IMPROVEMENTS IN AND IN CONNEXION WITH PHOTOGRAPHIC SHUTTERS OF THE CHARACTER KNOWN AS "BLIND SHUTTERS."

No. 15,666. HENRY COOK, M.D., F.R.C.P., Lond. J.P., &c., &c., Priors Mesne, Lydney, Gloucestershire.—*June* 23, 1894.

THIS invention relates to shutters for photographic purposes of the character generally known as "blind shutters" or "roller-blind shutters," and my present invention is designed to produce a shutter which will (*inter alia*) afford the following advantages combined in one shutter, viz.:—

1. A safety blind shutter.
2. A focal plane shutter.
3. Capable of regulating the duration of exposure.
4. Capable of regulating the size of the exposing aperture at each successive exposure without taking to pieces or disturbing the camera.
5. Capable of giving varying speed of travel during exposure, so that more exposure can be given to one part of the sensitive surface than to the other.
6. Capable of working close up to the sensitive surface.
7. A double blind shutter occupying very little space.

Besides affording, *inter alia*, the combined advantages and facilities above set forth, the whole of the parts are simple and economical in construction and not easily liable to get out of order.

My present invention is as follows:—

In a suitable frame or support I arrange and mount two separate and distinct roller blinds, which, for the sake of clearness, I will term the first and second blind, and these two blinds are advantageously mounted and arranged to travel in parallel planes or thereabouts and in close proximity to one another.

The first blind is mounted on two rollers or equivalents, so as to be capable of being wound off one roller on to the other to set the shutter ready for giving any exposure and thereby winding or straining a spring or springs, the reaction of which will wind back the blind when same is released and the exposure given through an aperture or opening in the said blind, thus passing across the path of the lens, all of which, *per se*, is old and well known in the numerous existing forms of blind shutters.

A second and similar blind is mounted and arranged in close proximity to the first blind, but entirely separate therefrom, being separately actuated by separate setting device, separate spring or springs acting on separate rollers, but simultaneously released with the said first blind, and each of these two separate blinds may, in setting, be caused to travel either the maximum distance or less, and can be set and held in any desired position; thus the first blind can be first caused to travel its maximum distance and there set ready for the release, the second blind meantime acting as a safety blind while setting the first, then the second blind can be caused to travel its maximum distance or any less distance, and is then caught and held by the releasing device (which simultaneously releases both blinds as hereinafter described), the first blind now acting as a safety for the second blind while setting the latter.

The two blinds may be mounted in opposite directions on their respective rollers, so that, by each winding outwardly, the part of each blind between the rollers can be brought very close to one another, and, if desired, travel in guideways or recesses along their edges, so as to prevent the one blind catching or interfering with the other.

For the purpose of simultaneously releasing both blinds, I arrange and mount a ratchet wheel, or equivalent, on the axle or one end of the roller of the first blind, and a corresponding ratchet wheel on one end of one roller of the second blind, and these ratchet wheels will be (or may be) right and left-handed. A releasing rod, or lever, extends to the exterior of the camera case or so as to be capable of being grasped or touched by the operator, and has two pawls extending therefrom, which pawls are respectively kept pressed into gear with the said ratchet teeth by means of spring or equivalent normally pressing said releasing rod in such manner as to keep the said pawls thereof continually in gear with the said ratchet wheels respectively.

Thus, when either blind is being set or wound ready for giving an exposure, the teeth of the ratchet wheel being revolved will run past the the pawl, while immediately the setting or winding gear is released the pawl will engage in the next adjacent tooth on said ratchet wheel, and similarly with the other blind, while on pressing or moving the aforesaid releasing lever the two pawls will be thereby simultaneously moved clear of the two ratchet wheels, and thereby the two blinds will be simultaneously released.

Any other equivalent or suitable simultaneous releasing device may be adapted or used in place of the foregoing if desired.

Any suitable means may be used for winding or setting each blind separately—for instance, a pulley on the end of the roller opposite the aforesaid ratchet wheel may have a cord chain or string wound thereon, with a knob or tag outside to grasp the end thereof. Upon pulling this cord or the like, same will be unwound off the pulley, and thereby revolve said roller, as is well understood.

A second and similar cord or the like would be wound in the opposite direction on a similar pulley on the roller of the second blind.

The winding of the first blind from one roller on to the other will cause a spring or springs or equivalent to be wound up or strained; for instance, a spring coiled within one of the rollers aforesaid, or a spring arranged outside and clear of said roller, one end of which is fixed to the drum and the other end having a cord or similar connexion therefrom wound round a drum or pulley on said roller, so that the rotation of said roller will cause the straining of said spring, which strain, upon release of the aforesaid releasing device, will cause the opposite revolution of said roller, or same may be spring-actuated or driven in any other suitable manner.

A second and similar separate arrangement of spring or springs or equivalent will similarly act on the second and separate blind.

Independent means are provided for winding or straining more or less the spring mechanism for each blind, so as thus to increase or diminish the speed of travel of same independently of one another. Thus the two separate blinds may be caused to travel at different speeds, *i.e.*, the front one quicker than the back one, or *vice versâ*.

Any suitable retarding device or regulating device, such as a pneumatic cylinder and piston, may be arranged and combined in any suitable manner with each blind separately; and, either with or without such pneumatic retarding device, I find it advantageous to use the following regulating device, by which I am enabled to give a differing speed of travel to the first blind at one part of its travel to the speed of the other part of its travel, and a similar second and separate regulating device applied to the second blind enables me to give a differing speed of travel to the second blind also when the exposure is being given.

For this purpose on the second roller of the first blind I arrange and mount a small friction wheel or drum, the periphery of which comes in contact with a second and larger friction drum or wheel, mounted on a fixed stud with a crank arm extending through the side of the camera case, or other means, to move round this dummy wheel or drum and also serve as an index pointer or indicator to show position of the dummy drum.

This second and large dummy wheel or friction drum (acting as a brake where it comes in contact with the aforesaid friction wheel on the axis of the blind roller) is mutilated, *i.e.*, has a segment or other part cut away or recessed out of the periphery, so as to destroy part of said periphery or circumference.

When this recessed or mutilated part of the brake drum coincides with the aforesaid small friction drum, the latter can then revolve unrestrained, and, when the circumference of said brake drum bears against said small friction drum, thereby considerable resistance is offered to the latter.

Now, by means of the aforesaid crank arm, or other suitable means, this large brake drum can be moved round so that the mutilated part lies furthest away from the small friction wheel, or at any intermediate position desired. Then, when the shutter is released, this small friction wheel on one of the blind rollers is thereby revolved, and in its turn bears against and revolves this said large brake drum until the aforesaid mutilated part comes round and coincides with the periphery of the small friction drum, and thereupon the latter finishes its revolution or revolutions unrestrained.

A corresponding separate regulating device or arrangement is independently and similarly applied to the second blind.

Thus, for taking photographs of landscapes, where it is desired to give to the foreground a longer exposure than that to be given to the sky, this friction brake can be set so as to cause a slower rate of travel to the blind shutter at the first part of the exposure when the foreground is being taken, and then a much more rapid travel to the shutter when the sky is being taken, this being a great desideratum in photography with a focal plane shutter.

To cause my shutter to act as a focal plane shutter of adjustable aperture, all that need be done is to wind up the first shutter to its full extent, and thereafter to wind up the second shutter to any desired degree less than its full extent, for instance, so that the top edge of the aperture of the second blind remains a quarter of an inch, or half an inch, or other desired distance, from the bottom edge of the aperture of the first blind. Thus, on these two blinds being simultaneously released, they will travel down together, keeping their exact relative distance apart (as set), thus acting as a focal plane shutter, and one which can be adjusted to a different size of aperture at each successive operation, if desired, by means of the setting or winding mechanism.

Blind shutters, constructed in accordance with the foregoing, thus afford facilities which (so far as I am aware) are not approached, or even contemplated, with any other one shutter in the market.

IMPROVEMENTS IN, OR IN CONNEXION WITH, PHOTOGRAPHIC SHUTTERS, KNOWN AS BLIND SHUTTERS.

No. 14,839. HENRY REX COOK, Fort Elizabeth, Cork, Ireland.—*July 7*, 1894.

THIS invention relates to photographic shutters, particularly of the character known as focal-plane blind shutters, or roller-blind shutters, and my present invention is as follows:—

In a suitable frame or support I arrange and mount the blind or opaque material which constitutes the shutter in two separate parts, which I shall hereinafter refer to as the upper part and lower part respectively, arranged to travel in or across a vertical plane or thereabouts.

The lower part of its lowermost edge is permanently affixed to the lower part of the frame, while the upper edge thereof is attached to a bar or other device (extending across the aperture controlled by the blind), and free to move up and down in a recess, or other suitable guide way, at each side of the frame.

The blind or opaque material of this lower part may be formed so as to fold and expand like a "bellows," or may be arranged and mounted in any other suitable way, so long as it is capable of being drawn out to its full length, and readily refold or stow itself away on being released.

A suitable lifting device (knob handle, cord chain, or connexion) is so arranged and mounted in connexion with the aforesaid bar, or other device, extending across the blind aperture, that this lower part can be thereby raised right across the aperture controlled by this said blind.

Also this said travelling bar has affixed thereto a cord or cords, or other connexion, attached to a drum or barrel containing a coiled or other suitable spring, so that when this said bar is raised the barrel is revolved, and thereby the spring is wound up and pressure is thereby exerted to draw down this lower blind.

The upper part (or upper blind) is also arranged to travel up and down in a similar manner, only in this case the top edge is permanently connected to the top or upper part of the frame, while the lower or free edge has a bar or other device travelling in the same or corresponding recesses or guide ways at the sides of the frame, while the opaque material forming this upper blind folds up bellows fashion, or in other suitable way as desired.

The bar or other device on the lower edge of this upper part is attached by cords or other suitable connexions to pulleys or drums fixed on an axle, to which latter the inner end of the aforesaid coiled spring is attached, these cords or connexions to the upper blind being wound upon said pulleys in the opposite direction to that in which the cords on the lower blind are wound on the aforesaid spring drum, so that the spring is thus wound up from both ends simultaneously as hereinafter further explained.

I also may provide means for independently winding up and unwinding this spring (or springs) for actuating these separate parts of the shutter so as to thereby vary the rapidity of travel of same as desired.

The aforesaid two separate bars or devices on the travelling edges of the upper and lower blinds are so formed or mounted as to form a light-tight joint between them when pressed or laid together.

To set the shutter, the said raising device controlling the lower bar is actuated so as to cause the lower bar to move from its lowermost position to the highest position, and, as the bar on the upper part lies in the path of this lower bar, same is thereby simultaneously raised with the lower bar, and, while the upper blind (or upper part) now becomes folded or moved out of the way of the lower part (or lower blind), takes its place across the blind aperture, and a spring catch or other suitable holding and releasing device now engages the said lower part as well as the upper part so as to hold same in position ready for giving an exposure, and in moving these two parts upward they remain light-tight, while the lower part at the same time has wound the spring from the outer end thereof, the upper part has wound the spring from the inner end thereof, and, consequently, this actuating spring has now a steady and equal pull on both parts to draw same down when released.

By turning or moving the releasing catch the lower part only is released, and moves rapidly downwards, thus giving the exposure, while at any desired moment after the release of the lower part the upper part is subsequently released, and immediately falls in the path of the lower part, this action closing the aperture after the exposure.

By this means an exposure of any desired duration may be given, from the most instantaneous to the most lengthened exposure desired, and, for the purpose of timing and accurately regulating the duration of such exposure, any suitable regulating apparatus may be used, for instance, a pneumatic retarding device, capable of offering varying degrees of resistance, such as are now well known in certain photographic shutters.

It will be obvious that this shutter is capable of modification in several ways without departing from the nature of my said present invention, for instance, the lower edge of the lower blind might be attached direct to the aforesaid spring barrel or roller, controlled by a spring, so that on raising this said lower part as aforesaid the blind would be unwound off this spring barrel or roller, actuated by a spring so that the spring would be wound up, the operation being identical as before described.

Also, if desired, the lower part may actuate a spring barrel or roller controlled by a spring independent of the spring controlling the upper blind, but in practice it will be found advantageous to use the one spring wound from both ends as before described, for the reason that, the one spring acting on both of the separate blinds, the pull or strength exerted on each will always be constant, and, consequently, the upper blind would not be liable to overtake the lower blind when giving an exposure unless this should be desired.

A further obvious modification would be to have the upper blind wound on a roller (instead of acting bellows fashion) if desired.

This shutter may be made to work on its side or in any desired position instead of vertically as may be required, and may be arranged and mounted and used for photographic purposes in any suitable manner desired, either separately mounted or built into the photographic apparatus with which it is to be used.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
13	North Middlesex	*Printing-out Processes.* S. Herbert Fry.
14	Birmingham Photo. Society	
14	Great Britain	
14	Hackney	*Retouching for Beginners.* W. L. Barker.
14	Manchester Amateur	
14	Paisley	
14	Rochester	
14	Stockton	
14	West London	
15	Bury	
15	Leytonstone	
15	Photographic Club	
15	Southport	
15	Southsea	
16	Birmingham Photo. Society	
16	Glossop Dale	
16	Hull	
16	London and Provincial	
16	Oldham	
16	Oxford Photo. Society	
17	Cardiff	
17	Croydon Microscopical	
17	Holborn	
17	Leamington	
17	Maidstone	
17	North Kent	
18	Croydon Microscopical	Excursion: St. Paul's Cray Common and Chislehurst.
18	Hull	
18	Liverpool Amateur	Exc.: Windermere. Leader, H. Holt.
18	Oldham	Excursion: Oldham Churches Leader, J. Chadwick.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUG. 2,—Mr. J. Traill Taylor in the chair.

Mr. R. P. Drage (an honorary member) was elected an ordinary member.

Some discussion arose in regard to the *Graphic* paying or not paying for the use of photographs.

Mr. A. COWAN said he had always found that the *Graphic* sent a fee (2*l.* 2*s.*) without being asked for payment.

Mr. W. COBB'S experiences were different to this. He said that at the death of the Prince Imperial the *Graphic* had employed one of his photographs of the Prince, and not only did he not receive payment, but his name as the photographer did not appear under the reproduction.

Mr. A. L. HENDERSON had generally received payment.

Mr. W. E. DEBENHAM referred to some experiences of his own, similar to Mr. Cobb's.

Referring to the competition (decided upon at the previous meeting) in copying an engraving, Mr. DEBENHAM asked what the negatives were to be taken for—contact printing or photo-mechanical purposes?

Mr. P. EVERITT thought the Judges might consider the negatives submitted under both aspects, and give their opinions accordingly.

In reply to a question, Mr. DEBENHAM defined the qualities of negatives suitable for photo-mechanical reproduction and contact printing. Eventually, as there appeared to be a difference of opinion between Mr. Debenham and

Mr. Henderson (another Judge) in connexion with this subject, Mr. Debenham asked to be excused from acting as a Judge in the competition.

Mr. Stoddart exhibited a device for enabling a longer exposure to the foreground than to the sky. It consisted of a bevelled diaphragm. He also showed negatives taken therewith.

Mr. W. D. Welford passed round a number of prints from hand-camera negatives, the clouds in which were well rendered without the use of any special device.

The CHAIRMAN said Mr J. H. Slight had brought this subject before a Photographic Society in Scotland nearly thirty years ago. He had obtained the effect sought for by placing a bar stop in front of the lens.

THE CONVENTION.

Mr. HENDERSON, the Association's delegate to the Photographic Convention of the United Kingdom, gave a brief report of the Convention, and showed in the lantern slides he had made from numerous negatives taken on the excursions and in Dublin, Cork, Killarney, and many other places. Many of Mr. Henderson's negatives were taken stereoscopically, and he incidentally strongly advised photographers to take up stereoscopic portraiture as an aid to business. Following the Convention slides, which were accompanied by many pleasant and agreeable reminiscences of the Convention doings, Mr. Henderson showed slides of views in Italian towns, including several taken at the Campo Santo at Genoa. A large selection of memorial sculpture showed very effectively on the screen.

At the conclusion of the lantern display, Mr. Henderson (who at the commencement, as it was an "Irish night," handed the Chairman a formidable-looking "shillelagh") received a hearty vote of thanks.

Mr. J. E. HODD showed two new lenses of English manufacture which, he said, were much cheaper than other English-made lenses, and turned out exceedingly fine work. One, a doublet, working at *f*-6, was of six inches focus, and, said Mr. Hodd, would cover a plate 12×10. The other, of five and a half inches focus, working at *f*-8, was for snap-shot work.

Mr. DEBENHAM, referring to the first-named of the two lenses, said that it seemed to him impossible from the position of the lenses that it could cover so large a plate as 12×10.

PHOTOGRAPHIC CLUB.

AUGUST 1,—Mr. Haes in the chair.

Mr. TOTTEM showed an improved form of the "Bull's-eye" camera, made by the Boston Camera Company. It was adapted for use with rollable film or glass plates in double holders. The resulting picture was 3¼×3¼. Each film cartridge was sufficient for twelve exposures, and the camera could be unloaded and reloaded in daylight. With the original "Bull's-eye" (using film only) Mr. Leon Warnerke had made many hundreds of exposures. Although the camera was sent out with a shutter to work at one speed only, Mr. Tottem pointed out that, the film or plate being square, the camera could be turned and held on its side instead of right way up. Then, if the shutter release was pressed when the arrow was pointing downwards, the speed was accelerated, because gravitation carried the shutter down. In the opposite direction, *i.e.*, with the arrow pointing upwards, the speed was slower, because friction made it so.

The Chairman showed the last number of Stoddard's 6*d.* collection of half-tone views (issued by Werner & Co.). One or two members pointed out that they were all more or less "pirated," and already the publisher had been called upon to pay 80*l.* or so to one British photographer, and more would be heard of the matter yet.

Brixton and Clapham Camera Club.—July 31.—The PRESIDENT (Dr. Reynolds) read Mr. Denison's Paper on *Photogravure.* Several plates sent by Messrs. Elliott & Son, Barnet, and distributed at the last meeting, were developed, after which slides by members were passed through the Club lantern.

Putney Photographic Society.—July 28, Outing to Moulsey Regatta.—This proved a very happy hunting ground for the members of this Society, most of whom carried hand cameras. The perfect weather that prevailed attracted a huge concourse of spectators to this popular regatta, who thronged both the river and the banks, the gay and varied craft offering excellent subjects for the snap-shotters, giving pictures full of life and animation so suitable for lantern slides. The party was somewhat separated, some of the members being in their own boats.

Capetown Photographic Club.—July 12.—A paper was read by Mr. E. J. Steer on *Platinotype.* It was decided that a "question box" be placed on the table at each monthly meeting, to enable the younger members to obtain information on any difficulties that might perplex them in their work. These questions would be read out by the Secretary, when, no doubt, some of the older members would be able to afford the required help. It was also proposed, as a recommendation to the Council, that a scheme for the photographic survey of Capetown and its surroundings should be drawn up by them, and submitted to the members for carrying out. The SECRETARY announced that some prize slides had arrived by the *Grantully Castle*, and considerable amusement was caused by his statement that the Customs had declined to pass them on the ground that they were "*not photographs, because they were on glass.*" One of the members stated that, if they were not photographs, they had better be returned at once, as they would be no use to the societies here. It was eventually resolved to instruct the Secretary to refuse payment of duty on them, and also that, should the Customs' authorities release them during this week, a public exhibition of them should be arranged for on Thursday, the 19th instant.

Nelson (New Zealand) Camera Club.—The fifth annual meeting was held in the Club-room on April 27, 1894, Mr. Fell in the chair.—A very hearty vote of thanks was accorded to the President (Mr. C. T. Fell) for his kindness in providing a meeting room for the Club ever since it was started in June 1888, and for the great interest he has always shown in its welfare. In reply, Mr FELL assured the members that it had always been a pleasure to him to help the Club, but that he was glad to be able to congratulate them on having acquired such suitable premises for their future use. He felt sure that the Club had taken a step in the right direction in providing a dark room for the use of members, and also a hall which would serve both for meetings and for lantern evenings, and urged members to use every effort to keep the Club in the prominent position it has always held amongst the photographic societies of New Zealand. The Secretary submitted a statement of accounts, showing a satisfactory credit balance for the year, and, after the customary votes of thanks, the following officers were elected for the session 1894 to 1895:—*President:* Mr. C. T. Fell.—*Committee:* Messrs. Glasgow, Pitt, Brasewitz, and Jackson.—*Custodian:* Mr. F. Moore.—*Hon. Secretary:* Mr. A. H. Patterson. The SECRETARY stated that the Club had now nine honorary and twenty-eight ordinary members on its roll, and that there was promise of several new names now that the Club had provided a dark room.

FORTHCOMING EXHIBITIONS.

1894.	
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 11–Oct. 6	Royal Aquarium.
,, 17–21	Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 23–Dec. 1	Stanley Show (Photographic Section).
December.....	South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COMBINED *VERSUS* SEPARATE TONING AND FIXING.

To the EDITOR.

SIR,—The correspondence on the above subject now going on is, I take it, interesting to most of us. I quite agree with "A Believer in the Combined Bath" (page 479) that the combined bath, if used with care, will give results as permanent as the separate baths. "Cosmos" says, in the same issue, that the combined bath was abandoned years ago for albumen paper, on account of the fugitive nature of the results Is this quite fair to the combined bath? Have I not seen notes several times in this paper from yourself to the effect that you have albumen prints, toned in the combined bath many years ago, which are as bright now as when they were made? I myself saw recently an albumen print made, I was told, twenty years ago, and toned with *sulphur* without gold, which appeared quite clear and plucky, and innocent of yellowness. Here, again, no doubt, the care bestowed upon the use of the sulphur toning bath was the cause of such permanency. I have used Eastman's combined bath on both P.O.P. and Solio for two years past, and have not yet experienced fading or yellowing. I invariably give my prints a bath of salt and water, followed by washing before toning in the combined bath. By this means the free nitrate is converted into chloride, and the bath does not become acid or charged with nitrate of silver. I think it is a mistake for makers to advise the toning of the prints without removing or converting the free nitrate and other soluble salts which the paper contains.

For eight months past I have occasionally used the following bath *without gold*:—

Hypo	1 pound.
Acetate of lead	1 ounce.
Precipitated chalk	1 ,,
Water to	80 ounces.

Of course the result is so-called sulphur toning. I place prints in the salt bath before mentioned, and then, after washing, into the sulphur toning bath, and can get capital tones, and, so far, can see no signs of fading or yellowing in my prints. And can "Cosmos" or any one else say why they should fade? My opinion is that, as the paper contains nothing but the reduced silver in the image and chloride of silver in the unreduced parts, the action of the combined hypo and lead bath consists in removing the chloride and converting the image into sulphide of silver and lead, than which I believe there are few products more permanent. Mr. Herbert Starnes objects to the use

of lead on account of the ease of its reduction, in the whites of the picture, to sulphide in the presence of sulphuretted hydrogen. The amount of this poisonous gas present, even in the most fetid atmosphere, is very small, but I think the danger from this may be overcome by giving the print, after fixing and well washing, a bath of weak acetic acid, after which the trace of acetate of lead may easily be washed away.—I am, yours, &c., WALTER RIDLER.

10 *Upper Dorington-terrace, Stroud, Gloucestershire, July* 31, 1894.

AN OPERATOR'S GRIEVANCE.

To the EDITOR.

SIR,—I see by the JOURNAL, dated July 27, your correspondent "Light" complains of the undesirable position an operator of ability has the misfortune sometimes to fall into. When I read his letter, it struck me that "Light" must have had the bitter experience of being in the employ, through one of those misleading advertisements, of an ex-cheap-jack or jack-of-all-trades, who lives in a van on the edge of a common in a watering-place in Wales. This individual keeps up the appearance as described by your correspondent, only he has described him mildly. This man, too, inserts in his advertisement for an operator and retoucher, "None but first-class men need apply;" and the advertisement is inserted often, since operators of ability, who possess self-respect, do not remain. It would, as "Light" suggests, be better if this class of photographer would be more explicit when advertising.—I am, yours, &c., BOND.

August 2, 1894.

THE DUBLIN CONVENTION GROUP.

To the EDITOR.

SIR,—In his letter of 30th ult. Mr. "Rudder Grange" wonders "if there will be any dispute as to who 'took' the Convention group *this* year."

I hardly think there can be any "dispute" about the facts; but, as I have not seen any reference to the group in the account of the Convention proceedings, it may be as well to state that the Convention group was arranged and taken by Mr. Werner, of Dublin, who later in the day submitted an excellent print for the inspection of those present at the Lord Mayor's garden party in Killiney.

The collotype print issued with the JOURNAL was from a smaller negative of Mr. Werner's group taken at the time by Mr. Kidd.—I am, yours, &c., JOSEPH H. WOODWORTH.

Booterstown, Co. Dublin, August 3, 1894.

PHOTOGRAPHERS AND THE ILLUSTRATED PRESS.

To the EDITOR.

SIR,—I have just cut out the enclosed from the *Lady's Pictorial* for August 4. Evidently this journal does not like paying for the use of the photographer's abilities; there's not so much objection to the photographer taking the pictures for nothing as charging for the use of same.

Why should these periodicals make use of photographs to their interest without paying?—I am, yours, &c., ALFRED FREKE.

12, *Duke-street, Cardiff, August* 6, 1894.

The following is the notice referred to:—

"NOTICE.

"Certain photographers are in the habit of applying to prospective brides, as well as to ladies moving conspicuously in society, for permission to take their portraits free of charge. They then claim to have acquired by that means a copyright in the photograph, with the object of selling copies to sitters and their friends, but more particularly of exacting fees for reproductions of the photographs from proprietors of illustrated newspapers. The Editor of the *Lady's Pictorial* therefore wishes to warn his readers against acceding to any such applications. The Editor will, if desired, recommend by letter a suitable photographer, by whom no claim of copyright will be made for photographs taken under any circumstances."

IMITATION PHOTO-KERAMICS.

To the EDITOR.

SIR,—We fear your article on "Imitation Ceramic Photographs" is calculated to create a false impression of the photo-keramics we are now producing for the trade, and which are literally what they profess to be, *i.e.*, permanent, inseparable from the body of the china, and glazed with as thoroughly hard and durable a glaze as is found on any china. The glaze, or rather varnish, which is spoken of in your article, and which is only heated to a temperature of 200°, is, of course, readily scratched with any sharp point, or may be removed bodily with a sharp chisel. Prolonged exposure to damp will deaden the surface, and certain spirits and alkalies will very readily affect it.—We are, yours, &c.,

Nottingham, Aug. 3, 1894. THE MIDLAND PHOTO-KERAMIC CO.

[Specimens which accompanied the above quite bear out the writers' statements.—ED.]

"E. R., TAVISTOCK."

To the EDITOR.

SIR,—I was told a few weeks ago that in your ALMANAC for 1889 or 1890 you alluded in your editorial article to the amateur photographer of Tavistock who cured the defect of frilling in the early gelatine plates, and you were desirous to know his name. I regret I cannot divulge his name without compromising myself; but it may possibly interest you to know that I was associated with the gentleman who made the discovery, and that I hold the negatives (which, I think, may be regarded as historic), which really proved the efficiency of our remedy. I exposed and developed the plates, and I suppose it would not be immodest on my part to consider myself as a coadjutor in the work of making the gelatine process a success.

If there are any gentlemen sufficiently interested in the advance of photography to desire a print from the negative, I could make arrangements to have some prints made. To preserve for my own pleasure a memento of the advance, I have recently had an enlargement done.—I am, yours, &c., EDW. HORSWELL.

Tavistock, August 3, 1894.

A CALL TO ARMS.

To the EDITOR.

SIR,—Before the discussion in your columns, *re* Cadett & Neall *versus* Professionals closes, I hope to be allowed a word. It is evident from the remarks of Messrs. Cadett & Neall, both in your columns and in their own organ, *Dry Plates*, published this month, that they entertain a very low opinion of professional photographers. In terms of unconcealed contempt they again and again refer to them, and advertise in big type their "money prizes for amateurs." Now, I have always understood that an amateur worthy of the name refused to work for money. Certainly I think the terms in which Cadett & Neall refer to us seem quite unwarranted; they may think it good policy to abuse their best friends, but how they can expect their support in future puzzles me.

If Cadett & Neall wish it to be "war to the knife," so let it be. Professionals have a simple course open to them.

The best thanks of the profession are due to "Rudder Grange" for his first outspoken letter.—I am, yours, &c., AN OLD PROFESSIONAL.

To the EDITOR.

SIR,—In answer to "Rudder Grange," I refer him to the Secretary of the National Association of Professional Photographers, Mr. D. J. O'Neill, 47, Charlotte-road, Birmingham. He will no doubt get fuller information from him than I can give off-hand.

Briefly, the Society is purely a professional one, intended to further professional interests in copyright laws, suppression of trade price lists in public journals, procuring better terms from dealers, &c. In fact, it can be made to endeavour to do just what the majority of members wish. All professionals are urgently asked to join, as it is essential that the body should be a strong one to effect any real good.

As to "Nemo's" insinuations, I can only say that I think them too vague to answer. The Society is not a perfect one, and in this world never will be. It is sufficient guarantee that its management is good, I think; that its Council is composed of successful business men, above suspicion of interested motives, men willing to give valuable time and advice at their own cost.

Finally I deplore the acrimonious letters on the subject. No good can ever come from bickerings and recriminations. There is a chance for us to *do* something; let us do it; if we cannot, let us be silent and wait and work for a better time. I should like to say much more, but the letter is already long enough.—I am, yours, &c.,

A MEMBER OF THE N.A.P.P.

Southwold, August 7, 1894.

To the EDITOR.

SIR,—The patriotic words of the "Marseillaise" seem suggested by the above, "Aux armes, citoyens! formez vos bataillons, le jour de l'action est arrivé;" for, be assured sir, that in order to stop that curse of modern civilisation, the amateur photographer, stronger measures will have to be taken than the aqua-lacteal suggestions of "Rudder Grange" and his friends. Let it be distinctly understood that no half measures will ever accomplish the extirpation of the amateur. Desperate diseases often require desperate remedies—there is but one way to extinguish him, and that is to "have his blood; to blot him out with his own gore."

Only think, sir, we are within a few years of the most remarkable century of progress the world has ever known, and yet a man is allowed to spend his own money as he likes on cameras, lenses, chemicals, &c. Ay, sir, and pay without discount for plates, paper, and all else he requires, simply because he wishes to pursue a harmless, delightful, and scientific pastime. I say, sir, down with such a man—the professional

who is worth his salt would not wipe his boots on such a creature; he must be rooted out from his hunting grounds. By lake, sea, river, and moorland stream he is to be found—up, then, and at him! You have been called to arms; do not let "the call" resolve itself into mere swash-buckler braggadocio, but bring plate-maker, dealer, and amateur alike cringing for mercy to your feet. Boycott the dealers by all means; the dealer who supplies an amateur must be "removed." Aux armes! Warroo! "Come on, Macduff, and damned be he who first cries, Hold, enough!"—I am, yours, &c.,

S. A. WARBURTON.

Leeds, August 7, 1894.

To the EDITOR.

SIR,—Why all this fuss about amateur competitions promoted by certain plate-makers? A man has perfect right to conduct his business as he pleases. Let professional photographers deal from the firms that study their interests—and there are one or two. I am a country "pro.," and in no way connected with any plate-makers; but, if we *do* patronise these firms and *do use more* plates than amateurs, then these apparent enemies must vanish as quickly as they came.—I am, yours, &c.,

N. DEVON.

To the EDITOR.

SIR,—"Rudder Grange" is very evidently a professional photographer who needs a little advice, and, with your permission, Mr. Editor, I will endeavour to give him that which he evidently stands in great need of.

His greatest complaint is that the plate-makers will not allow him the same discounts and advantages they offer to the chemist or retail trader. The only remedy for this is to place the mystic words, "*Dealer in Photographic Apparatus and Materials*," on his business cards and memoranda, and take his 25% like a lamb.

He need not push the sale of plates, apparatus, &c.; but, if he takes my advice, he will do so, because he will find the amateur customer worth courting, with his orders for ready-made solutions, prints, sundries, and enlargements. He need have no special display of goods; he need sell but one dozen quarter-plates per month; but from the advantages derived from his dealer's discounts he will find it will pay him.

Why should the local chemist take up photographic dealing any more than the local ironmonger? And I say *it is false policy on the part of the local photographer to send the amateur away from his doors.*

The provincial photographer has been always blind to his own interests, or why has he allowed the numerous firms of view publishers to sell stationers and others local views that he could have as well supplied? In many towns this particular business is being regained by the local photographer, but it has taken some time to wake the local artist up from the lethargy into which he had fallen.

As to the promotion of photographic competitions, I see nothing unfair, be they amateur or professional.

Respecting the statement that photographers are fond of long credit, and notoriously bad payers, it is a statement that is substantially correct with reference to the shoddy and shamateur lower-class professional; but the up-to-date, modern-day professional knows the advantage of "short credit" and consequent low prices, and has as good business ability as any other tradesman or professional man.

I am glad to see "Rudder Grange" seeks acquaintance with the National Association of Professional Photographers. His connexion with that Association would both benefit himself aud his fellow-workers. Doubtless, the Secretary, Mr. D. J. O'Neill, 47, Charlotte-road, Birmingham, will send him particulars, or he can apply for same, and it would speak much for the photographers of Britain would they all join that Association; but, alas! they have always stood in their own light, and will to the end of the chapter.—I am, yours, &c.,

August 4, 1894. A MEMBER OF THE N.A.P.P.

To the EDITOR.

SIR,—We ask indulgence for a few lines of your valuable space for further reply to "Rudder Grange," after which, so far as we are concerned, further discussion on "A Call to Arms" must cease.

"Rudder Grange," you are getting worse than ever; the sooner you leave Old England, and its free-trade liberties, the better. If you think, in these *fin-de-siècle* days, that you will get grandmotherly protection and the MacKinley style of business in this solid old country, you make a woeful mistake. Better leave the country at once. To tell us that we have *no right* to promote amateur competitions is preposterous; we might as well say that, having once used Cadett & Neall's plates, you have no right to use any other.

You almost tell us that amateur photography should not exist, for you imply that it should be discouraged. Let us tell you that nearly every discovery in photography is due to the amateurs. The very processes and methods of development you are using are due to the amateur. The hundreds of photographic societies that exist are due to the amateur. Compare this enthusiasm with your apathy, which *even now* shows you entirely ignorant of the "address, objects, and aims of the National Association of Professional Photographers." You stand self-confessed. The Photographic Society of Great Britain would never have existed had it depended on the support of the professional, though this gentleman is willing to exhibit thereat.

We did tell you something that you did not know, and tried to prove it, viz., that the amateur was a help rather than otherwise. You say the contrary, but do not offer a scrap of evidence to support your assertion.

Your remarks *re* the late Messrs. Samuel Fry & Co., Limited, were most rude and uncalled for, because, in implying their suspension of business due to promoting amateur work, you offered no proof or warrant for your assertion; and, in talking of the truth being a bitter pill, your *truth* is mere assumption, and not fact.

It may interest you to know that we have had many letters from professional gentlemen whom we know to be good payers thanking us for having the courage of our opinions. Any sensible person will not take offence at what we say, and our remarks only apply where the cap fits. You ask us to remove the annoyance of the photographer being unable to get dealer's terms, we gave you the reason why we could not do this, namely, that we should require unlimited capital, and we have enough to do in making plates without running all over the country to collect accounts. We have never expressed any contempt whatever for the professional; we know only too well that some of them are men of the very highest ability and business habits; but, *exceptio probat regulam*, the dealer certainly bears the palm for being the best payer, and we know that ninety-nine out of one hundred would agree with what we say. We are, of course, sorry to lose any users of our plates, but this is a free country. "Rudder Grange" is at liberty to obtain his plates where he pleases, and we have no doubt that, when he wants his next batch of "Cadett" plates, he will order through his dealer as usual.—We are, yours, &c.

Ashtead, Surrey, August 3, 1894. CADETT & NEALL.

"USED-UP SOCIETIES."

To the EDITOR.

SIR,—Your contributor "Radiant," in his vigilant "Search Light," remarks upon the complete absence of interest shown by members of the London photographic associations during last month, and suggests that all meetings might well be suspended until after August.

Of course, if no one attends meetings, there is much inducement to drop them, but it seems to me that the cause of such extreme lassitude and lack of interest is greatly due to the immoderate and senseless multiplication of meetings held year by year by various London associations from September to June, during which period the Society man becomes utterly sickened by the photographic dissipations he is induced to take part in.

I feel sure that all concerned would be thankful if, during the coming season, the tedious repetitions and the clashing rivalries of the leading associations of the Metropolis were curtailed. There is too much stale cackle; a glut of hash received with yawns.

In the prvinces, I fancy the feeling of complete satiety is not so pronounced, because there is less opportunity for technical excess. Take our own association (the Croydon Camera Club); I find that at our last regular meeting, holden July 25th, there was an attendance of eighteen, the subject being, "*A Consideration of the Relative Advantages of Using Borax or Soda in combination with the Sulphocyanide Toning Bath.*

No doubt our experience is much the same as is the case with many another provincial Society, due, I think, largely to the fact that we do not, at any time of the year, overdo lectures and demonstrations, as is, I venture to think, the case in London.—I am, &c., HECTOR MACLEAN.

Birdhurst-road, Croydon, August 6, 1894.

CENTRAL PHOTOGRAPHIC CLUB.

To the EDITOR.

SIR,—Kindly allow us to bring before the notice of your readers that the Central Photographic Club will have a special excursion on Saturday, August 18, to Weybridge. Arrangements have been made with the London and South-Western Railway for a reduced fare and reserved carriages both ways. We have also made arrangements for tea at the Weybridge Institute. The cost of railway fare, including tea, will be 3*s.* each. The train leaves Waterloo at 2.27 p.m., and returning from Weybridge at 8.45 p.m. We shall be glad to have the company of photographic societies or individual photographers, hoping to make this the largest success of the season. Weybridge, being situated at the confluence of the rivers Thames and Wey, with charming scenery, is well worth a visit with the camera. Members and friends wishing for tickets will oblige by making an early application to us.—We are, yours, &c.,

J. T. FRENCH,
25, *Nutbrook-street, Peckham, S.E.*,
WILLIAM F. SLATE,
Aug. 4, 1894. 169, *Southampton-street, Camberwell, S.E.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange carved oak chair in good condition for balustrade set.—Address, JOHN E. PURVES, Rothesay, N.B.

Good cabinet portrait lens, will exchange for Ross No. 2 portable symmetrical lens.—Address, HUFF & SONS, Maryport, Cumberland.

Wanted to exchange *carte-de-visite* portrait lens by Dallmeyer for 15×12 printing frames with plate-glass fronts.—Address, E. SCAMELL, 120, Crouch-hill, N.

Exchange several years' BRITISH JOURNAL OF PHOTOGRAPHY, *Photographic News*, *Photography*, for half-plate lens.—Address, E. BELL, Uxbridge-road, Ealing Dene, W.

Will exchange Presto hand camera and model steam launch for Le Méritoire or Merveilleux camera set, quarter-plate.—Address, F. W. BAYLES, 48, Cromwell-road, Peterborough.

Exchange 5×4 Vever's rectilinear, cost 18*s.* 6*d.*, for Watkins' exposure meter; or the above lens and Thornton-Pickard snap-shot shutter for Beard's hydrogen regulator.—Address, G. N. FUTCHER, Photographer, Chichester.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

C. A. B.—We tried the retouching medium, which answers quite well.

A YOUNG SUBSCRIBER.—The exchange had to be held over on account of pressure of other matter.

DOUBTFUL.—The specimens evince considerable artistic skill in posing, lighting, &c., although, as prints, they are susceptible of improvement. Returned as requested.

"DR. BUTON COXE."—Received; but may we not put your own name (which is obvious to us from the familiarity of your handwriting) to your interesting communication?

C. WARPELL.—Gelatine is not soluble in alcohol; but, if it first be dissolved in water, then a considerable quantity of spirit can afterwards be added. The solution then forms a good mountant.

C. C. H.—Paper can be coated by hand with gelatino-bromide of silver. The paper can be floated on the emulsion placed in a dish, or it can be coated by drawing it over the surface of it in a narrow trough.

O. BUNO (Madeira).—We know of no such album in the market. Any album-makers, such as Marion & Co., would, of course, construct such a one as referred to in your order. That is the only way we can suggest of obtaining one.

W. A. T.—If you were surprised, we are sure no one else would be, that you were not allowed to take photographs of some of the pictures in the Royal Academy Exhibition, even though the copies were not to be published.

J. SOMERS.—In a studio thirteen feet long it will be impossible to take full-length portraits of the cabinet size without getting very violent perspective, which yields very unpleasing pictures. In such a studio better confine the portraits to bust, or, at most, three-quarter length.

PEDRO.—If the paper does not print to sufficient depth with three hours' exposure behind a thin negative, there is no question there is something wrong with it; what, we cannot say. Better communicate with the makers, or return it to the dealer who supplied it as being faulty.

R. O. C.—One ounce of hyposulphite of soda to a pint of water is not strong enough for fixing albumen prints with a ten minutes' immersion. If your prints will not stand a longer immersion or a stronger bath than this without fading away, there must be something radically wrong in your method of working.

ALF. D.—You will stand at quite as much risk, if not more, in using a hand camera in the vicinity of forts, whether French or German, on the Franco-German frontier, as, in using one with a stand. Hand cameras of whatever form are now as familiar to the authorities on the frontier as those mounted on tripods, and they are quite as watchful for them.

A. WILLIAMS, JUN.—It does not follow, because the copyright in old engravings like those of Hogarth, Bartolozzi, and others has expired, that there may not be copyright in reproductions of them. For example, you might copy the originals and make your copies copyright. It will be perfectly safe to reproduce the works if care be taken to copy from the original engravings.

T. W. (York).—If the japanned-tin vessel has become rusty through the japan wearing off, we suspect it would be more economical in the end to get a new one rather than to have the old one repaired and re-japanned. Probably, if the tray were thoroughly cleaned and repaired, and then were given two or three coats of Brunswick black, it would serve its present purpose for some time longer yet.

H. M. RUMBLE says: "I shall be greatly obliged if you will give me a good formula for a combined toning and fixing bath for gelatino-chloride P.O.P.—one that I can rely on."—You will find several formulæ for combined toning and fixing baths at pp. 888–91 of the ALMANAC for 1894. We must remind you, however, that the makers of P.O.P. do not recommend the combined bath for that paper.

H. H.—You might try the effect of a moderately strong solution of potassium cyanide. Failing that, Messrs. Marion supply a solution which will probably remove the stain.

W. BOWERS.—If the packets of plates are duly labelled to be opened only in a red light, and as photographic plates, no difficulty will be experienced in your taking them with your personal luggage through the Belgian Custom-house. With regard to the restrictions (if any) as to photographing within the precincts of the Antwerp Exhibition, we can say nothing. We should expect, however, that there are some, the same as is the case at all exhibitions.

J. WALKER (Didsbury) writes: "Would you kindly tell me the best compound to black the inside of a wood hand camera a thorough dead black? It is already blacked, but seems inclined to give off a slight finish."—Thin some brown hard varnish with methylated spirit, and mix in some lamp-black. The more spirit and black, the deader will be the colour when dry. If, however, too little varnish be used, the colour will not be fixed, but will rub off.

SIGMA asks which printing process will yield good and permanent prints with the least trouble as regards manipulatory details? Ordinary processes, he says, are too troublesome as regards care in working and in the final washing—If good and permanent prints are required by any process, the proper care must be bestowed upon them to secure these results. Perhaps the process that lends itself best to perfunctory treatment in these respects is the carbon process, for, if good prints are obtained, their permanence may be taken for granted.

S. G. ESSLEMONT writes as follows: "Enclosed I send print which had ordinary care in printing, washing, fixing, and alum. The mounts are very fair ones, and I think it can scarcely be them. If possible, I shall be glad to know the reason of staining. It is Ilford P.O.P., toned by the ordinary sulphocyanide bath (separate)."—With all deference to our correspondent, the print had not ordinary care, or the stain would not have been there. It is due to imperfect fixation. Either it was removed from the fixing bath too soon, or, what is more probable, the prints were allowed to stick together, so that the solution had not free access to all.

FIX asks: "Will you kindly tell me the cause of the white spots on the enclosed print, which is upon Ilford P.O.P., and toned with the sulphocyanide bath? Also the cause of the purple stains, which look like a precipitation of gold in its metallic state. They were treated to a fresh bath, which, upon being made, at once assumed a purplish look or shade, contrary to our general experience. I should state that the alum bath is used after fixing."—The pale spots seem to be due to air bubbles adhering to the surface of the print at the time it is first put into the fixing solution, or, may be, when transferred to the first washing water. The toning bath assuming a purple tint when first made would indicate that it was made in an unclean vessel, or with impure materials. That may account for the purple stains, which are quite superficial.

E. LEY says: "I shall be very thankful if you can help me over the following difficulty. I have a studio which has been built about ten years, and is lighted from the east and west. When the sun is shining, I have to use the west light in the morning and the east light in the afternoon. The difficulty is this: my next-door neighbour but one has extended his premises at the rear of his house, with a blank brick wall facing the west (that would face the east light of my studio). The sun shines on the brick wall in the afternoon, and reflects into my studio a brownish or yellowish light, which is caused by the colour of the bricks. I have spoken to the owner about it twice, but he has taken no further notice of it. What would you advise me to do? It greatly reduces the power of my light, and therefore becomes a nuisance, which I feel I can compel him to abate. In the event of him doing so, and he should ask my advice as to colour, &c., what would you recommend the wall to be done to, especially as regards colour that would not interfere with my light? Your advice through your valuable JOURNAL will be eagerly looked for."—In the first place our correspondent can do nothing, as his neighbour has a perfect right to erect anything he likes on his own premises, so long as he does not interfere with "ancient lights," and these do not exist, as the studio has only been built for ten years. Even if they existed, it is doubtful if the new building, being so far away, could be proved to stop off light. With regard to the reflection from the brick wall, we are inclined to think the trouble is more imaginary than real. If the wall were whitewashed, then we suspect that more light would be obtained in the studio than was the case before the new building was put up. But we fancy that the intervening neighbour would object to that, as it would cause an unpleasant glare on his window.

ERRATUM.—In the last number we spoke of the price of the *Four Generations* as 8*s.* a dozen. For 8*s.* read 18*s.*

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PREVENTION AND CURE OF FRILLING IN GELATINE SURFACES.

In the early days of gelatino-bromide plates, the users were not unfrequently pestered with certain small difficulties in working with them successfully, difficulties of which we know but little at the present day, so successfully have they been minimised, if not obliterated.

The evil which we have more particularly in view at present is one that is suggested by the perusal of an article in last issue of the *Photographic Times*, from which we deduce that frilling or puckering of the gelatine negative film is more prevalent in the United States of America than with us here in the United Kingdom. The great heat that has prevailed of late in America has probably much to do with the frilling of the gelatine coating, although it may in some degree be owing to the gelatine selected for emulsification. One make of plates, of which some years ago we used many, almost invariably frilled in the developer when made with soft water, but as invariably escaped frilling when the water was hardened by the addition of a little Epsom salt (sulphate of magnesia), of which we always kept a supply ready at hand. This seems a fairly reliable preventive of frilling, at any rate it has proved to be so in the case of such plates addicted to this evil that we have tried. Soft or distilled water, on the contrary, never failed to develop the evil in its worst form in such plates.

As a curative agent for a plate which has been badly frilled, we have seen an application of a dilute solution of ferric chloride act like magic. The puckering in one case was so pronounced, that, if the portion of the film affected had been cut away from the main body and transferred to another plate, its area would have been found to have increased to nearly twice the original dimensions; but, as previously stated, photographers in this country now enjoy, in a large measure, immunity from the evil. That there are exceptions was proved to us some few months ago, when, on making transparencies for the lantern, we found every plate in a certain packet pucker more or less in the developer. This was perhaps the worst case we have experienced, but we saved the dozen by the chloride of iron cure, which brought the raised ridges flat down upon the glass.

It is claimed by Mr. W. E. Woodbury, of the *Photographic Times*, that he has invented an anti-frilling solution that is more effective in its action than any others previously published. It it sold under the name of "antipyr," and is employed after the plate has been immersed in water or developer which may predispose frilling, or it is used in the fixing bath or after fixing. Mr. Woodbury withholds a detailed description of how it is made or of what composed, which, under the circumstances, is perhaps excusable, seeing his connexion with a stock house by whom it is sold; but he informs us that a leading ingredient in its composition is formyl aldehyde. We have every reason for believing that this substance will prove very useful for the purpose for which it is now being placed on the American market.

Some of our readers may recollect that early in February last we directed special attention to the action of formalin (also known as formaldehyd and formyl aldehyde) in inducing such a degree of hardness in gelatine as to render it absolutely insoluble, so much so, that it could not be liquefied even when exposed to the flame of a Bunsen burner, or boiled in a soda solution, and we then stated that it should offer great possibilities in the way of frill and blister prevention.

Apropos of this suggestion, Mr. F. H. Glew published some useful notes respecting the property referred to. Formalin, he told us, was merely a trade name of a forty per cent. solution of formic aldehyde in water. This (formic aldehyde) is a gas at ordinary temperature, but is freely soluble in water. The chemical constitution is CH_2O, and it is also known as methylic aldehyde, being obtainable from methylic alcohol by oxidation. It is not even necessary that the film to be treated should be immersed in the solution, for the moist vapour given off by the solution is capable of rendering insoluble a thin gelatine film in the space of half an hour. Intelligent readers will know what use to make of these hints.

"It never rains but it pours," says the adage. Since writing the foregoing, the specification of a patent for effecting the same purpose, and by the same means, has been published by Drs. Reissner & Hauser, both of Erlangen, Bavaria. As the specification is both brief and practical, we give it a place here as follows:—

This invention relates to improvements in the making of films or dry plates for photographic purposes, and especially the kind of films which are made from gelatine containing bromide of silver.

The object of the improvement which forms the subject of the present invention is to so treat the films that they can neither be liquefied by immersing them in warm water after having been dried, nor can they be caused to do so by drying them in a warm room after they have been wetted. The gelatine films which have been used until now are imperfect, inasmuch as they frequently liquefy during the processes of developing, fixing, washing, and drying, in cases where these manipulations are carried on during warm weather or in hot southern countries. It is obvious that the films must be rendered useless when this occurs.

According to the present invention, the gelatine to be used in the

manufacture of films is rendered insoluble by the action of formaldehyd (CH_2O), to such a degree that the film may be immersed in water of 122° Fahr., or may be dried in a room having the same temperature, without any danger of its liquefying.

It is obvious that in some cases it may be useful to treat in the same manner films or sheets of gelatine used for other technical purposes as well as photographic ones.

The improved process is as follows:—

The formaldehyd is dissolved in water, that is to say, preferably 0·2 parts of gelatine in 100 parts of water. The gelatine is then added to this solution. It may be mentioned that 0·2 parts of formaldehyd are able to render insoluble 1·0 part of gelatine. The gelatine may remain in the solution for one or two hours. Films of less thickness will be permeated sooner. The gelatine may be added to the solution in a dry state, or it may be added after it has been liquefied.

The gelatine is then formed into sheets or films, if this had not been previously done, and it is dried in the air. The forming into films is preferably done by spreading the gelatine upon plates of glass or metal, the surface of which has been polished.

As the rendering insoluble of the films is effected during the drying process, it may be mentioned that the gelatine must not be washed after having been taken from the solution.

It is obvious that, instead of making use of the formaldehyd itself, the component parts, by the mutual influence of which such formaldehyd is composed and produced, may themselves be used.

What is claimed is: (1) A process for rendering insoluble, in hot water, films consisting of gelatine, by treating them with a solution of formaldehyd, substantially as described; (2) A process for rendering insoluble, in hot water, films consisting of gelatine, by treating them with a solution of the component parts, by the mutual influence of which upon each other formaldehyd is generated.

Application for this patent having been made on September 28 last year, although the specification just quoted was only left on June 7 this year, both our own suggestions of last February, and Woodbury's "Infallible Anti-frill," which he says he has invented within a few weeks, will have to give way to the prior-dated claims of the two learned German doctors named.

PHOTOGRAPHIC MATERIALS AND THE RAILWAY COMPANIES.

We purpose now to give the promised sequel to the article on Railway Carriage Charges in our issue for the thirteenth ultimo. Let us premise that the companies divide the various consignments they take charge of into Classes A, B, and C, and I., II., III., IV., V. The letters refer to consignments of two tons and upwards, and we may safely leave those to the merchants interested. Classes I. to V. deal with quantities under that weight, and are charged in proportion ton weight until three hundredweight or less is sent, when a special increased rate is charged for them as small parcels, the rates for each fourteen pounds being given on inquiries, fractions of that weight counting as fourteen pounds.

There is then a further classification into "Explosives and Dangerous Goods," "Inflammable Liquids," and "Dangerous or Corrosive Chemicals." The Railway Companies will always quote a rate from town to town for any class, but do not publish a list of prices. In the first set of five classes, No. I. is the cheapest, and the others increase up to V.

Our special purpose is to deal with so-called dangerous and explosive goods, but we may give a few examples how certain photographic materials are classed. We must here point out that we are speaking of goods despatched by goods trains, and specially invoiced to the railway company as such; many photographers, ignorant of the differences, send heavy packa by "passenger train," and so incur a very highly increas expense. This mode is only suitable for comparatively sm and light articles. Photographic apparatus is classed at t highest rate (V.); photographic frames, "*small, gilt, or plu covered*," packed (III.); picture-frames not gilded (III.); b pictures and picture-frames are in (V.). Glass—*crown* a plate, &c. (III); but at a reduction if carried at "Owne risk." "*Prepared glass* for photographers" is Class IV., subje also to this reduction. Sulphate and sulphite of soda a placed in Class C, subject to a special "alkali list." Valuab lenses should go by passenger trains.

Passing on now to "Explosives," we have Class III.- "Nitro-compound Class"—which includes gun-cotton, and n doubt pyroxyline, in division 2 of that class.

Class IV.—"Chlorate Mixture Class." The term chlorat mixture means any explosive containing a chlorate.

Class VII.—"Firework Class." The chlorate mixtures "ar not carried by any railway company." This will bar the send ing of flash light mixtures containing a chlorate, and rende any sender not declaring his consignment as such to heav penalties. Indeed, this is the case with regard to any infrac tion of the bye-laws with regard to these dangerous goods. How ever, these chlorate flashlights might, perhaps, go as fireworks with a minimum charge of 10*s.*, the rate being fifty per cent increase on ordinary Class V.

"Inflammable Liquids" include benzole (and benzole varnishes), and indiarubber solution, in Class III., and wood naphtha, Class V., with a minimum charge of that for one ton, or of five shillings for rubber solution.

Collodion is Class V.—"In hermetically sealed tins or bottles packed in sawdust, in cases not exceeding 56lb. each package." Class V. only carried from station to station, *i.e.*, not delivered on minimum charge of five shillings.

Ether lies under the same rules, but comes under Class III. rates of carriage.

"Dangerous or Corrosive Chemicals."

"Ammonia Liquid (fortissim)." In lots under two tons a minimum charge of five shillings, and not delivered, packed in glass carboys, or in bottles packed in cases or hampers. Hydrochloric acid is under the same conditions.

Nitric acid the same, but packed in glass carboys, or in bottles packed in cases or boxes.

Hydrochloric acid, however, in bottles packed in sawdust in cases goes at Class V. rate, collected and delivered.

Perchloride of iron in bottles in cases or hampers is included, and is charged double Class IV., minimum five shillings.

Thus far as to rates; but there are further conditions as to sending.

Collodion "ether;" each package before delivery to the company must have a label attached printed in conspicuous characters bearing the words "Highly Inflammable," and stating the contents and name and address of sender. "Loading and unloading must be performed during daylight," and consignments will not be accepted on a Saturday. Hydrochloric acid, almost a necessity for platinotype work, with also nitric acid and ammonia, must not be loaded with other goods liable to be damaged thereby, and the loading and unloading must be performed by the owners—and not the servants—of the companies. Nitric and sulphuric acids must not be enclosed in the same package, or loaded with other chemicals, nor must they be packed together; bottles of nitric acid must be packed in

and or other matter next to the acids. Ammonia liquid must not be enclosed in the same package as with acids.

Finally, we have to deal with compressed oxygen (Class II.) nd compressed hydrogen (Class III.). On January 1 his year the prohibitive rules of last year were relaxed. They ill be collected and delivered at charges as per class named, ut the following instructions have to be attended to:—

"The consignment note for these articles must in each case e endorsed by sender with a certificate as follows:—The *ylinder* [cylinders] used for this consignment *complies* [comly] with the condition that *it* [they] must be of wrought iron r of mild steel containing not more than two per cent. of arbon, thoroughly annealed after manufacture, of sufficient trength, and efficiently tested."

Without having been actuated by any wish to create needess alarm, we have thought it highly desirable that all interested in photography, sellers or purchasers, should be aware f the above-quoted stringent railway conditions and the ttendant risk of penalties in case of neglect.

RELATIVE EXPOSURES.

THERE is one point in connexion with the exposure of modern ry plates to which the great majority of amateurs, at least, carcely give an adequate amount of attention, namely, the elative sensitiveness of different plates under varying conditions; and, so far as we are aware, none of the published "exposure tables" take cognisance of the fact, that the relative apidities of any two plates may appear to vary very considerably as the character and quality of the light are varied.

In the old collodion days an example of what we mean was found in the well-known fact that it was possible to prepare a dry plate which, under favourable circumstances and in a good light, was apparently little inferior in rapidity to a wet plate prepared with the bath in its best condition, but which turned out to be very inferior indeed when the conditions of light were changed. Thus the two plates, if exposed, we will say, to an open and well-lit landscape during the best part of the forenoon in summer, would exhibit very little practical difference in sensitiveness; but, if the time were changed to late in the afternoon, or the season to winter, the wet plate would turn out to be many times more rapid than the other.

Similarly, if the character of the subject were altered from open landscape to scenery comprising wood, and glen, and overhanging foliage, or to dark interior, the superior sensitiveness of the wet plate would again make itself very prominent, the difference in the behaviour of the two kinds of plates being so marked with that class of subject that it was possible, with almost certainty, to pick out from a number of prints the results produced upon wet and dry plates respectively.

On the introduction of gelatino-bromide plates there was a corresponding difference, but this time in favour of the dry plate, and it was claimed by some that the advantage of the dry plate was greater in the winter months, or under unfavourable conditions of light, while others denied *in toto* any such difference. The supporters of the former theory maintained that, owing to the comparative poorness of the winter light in the rays of higher refrangibility, the greater sensitiveness of the dry films to the preponderating yellow rays gave them an advantage over wet collodion; that, in fact, the alleged superiority was due to a greater capability of correct colour rendering. As the result of direct experiments, however, we believe it was never proved that any such advantage existed; indeed, if we remember rightly, it was distinctly shown that no greater variations were found between wet and dry plates than between different grades of either singly—that, in fact, the question of colour sensitiveness had nothing to do with the matter.

That this is the correct view is, we think, partly at least, proved by an apparent anomaly in the behaviour of wet and dry collodion plates respectively. Although, as has been pointed out, the wet plate was far more sensitive in the camera in a bad light than the dry, still it was possible to manipulate it in a light which would have proved fatal to its dry rival; in fact, a naked candle flame which scarcely affected the wet film would hopelessly fog its slower rival. Manifestly, then, the superior sensitiveness of the former, under unfavourable conditions of light, could scarcely be set down to any influence the relative sensitiveness of either to the less refrangible rays might exert. If it were otherwise, we might naturally expect that the yellow screen employed with any ordinary plate would produce the full orthochromatic effect, which, as we have stated only a week or two since, it does not.

But, without attributing any of the effect to the colour-rendering capabilities of the films, it is not only possible that they may do so, but it is an actual fact that two plates of widely different degrees of sensitiveness as measured by the sensitometer do very materially alter the apparent ratio of their relative sensitiveness under altered conditions of light and subject. The composition of the respective films may have, and undoubtedly has, something to do with the result; for instance, with two plates of practically equal rapidity under one set of conditions, if the one film contains iodide of silver, while the other does not, they may be expected to show a distinct difference in behaviour, although, even with the newly imported element of variation of composition, it does not seem possible to frame any definite rule to account for the difference.

All that can be said with any certainty is, that the more rapid the film as tested by the sensitometer the less does it vary from its normal behaviour under adverse conditions of light or subject; and, *per contra*, the slower the plate in a fairly good light, the more will the exposure have to be prolonged in proportion when the light is worse or the subject a difficult one. Thus it is no uncommon thing to find that we will say, for an open landscape, two plates may bear the relation of perhaps two or three to one as regards sensitiveness, while for an interior, or a portrait in the studio, the difference may reach as much as ten to one.

Further than this, for studio work it is not too much to say that, with some of the slower makes of plates which work to perfection out of doors, no possible or practicable prolongation of exposure would give a result equalling that obtained upon the more rapid plates. The force of this argument will be recognised by any one who has made the experiment of taking a portrait in an ordinary room with a wet-collodion plate.

From what has been said, it may be inferred that we scarcely place much reliance upon published tables of exposure as applied indiscriminately to plates of widely different degrees of sensitiveness.

ARE PHOTO-MECHANICAL ILLUSTRATIONS TOO COMMON?

THANKS partly to photography, celebrity is easily obtained nowadays. It would possibly be more strictly correct were we to say, instead of celebrity, that publicity and notoriety are

within the reach of all who aspire to have them, but that the three terms, though in reality having somewhat different meanings, are commonly accepted as interchangeable, so that one may be freely taken for the other at will, in the assurance that the meaning will be the same in its application throughout. It is a feature of the hour that, let a man or a woman (particularly a woman) do anything good or bad, clever or stupid, sufficiently marked to distinguish it from the commonplace or the matter-of-fact, and he or she may rely upon being immediately written and talked about, *ad nauseam*, and have his or her face or figure, home surroundings, his or her ox, ass, maid-servant, and everything that is his or hers, illustrated and published. The interviewer and the photographer are pressed into the service of ministering to the insatiable appetite of curiosity which most people nowadays possess, and the result, to the old-fashioned student of modern periodical literature, who has escaped contaminating contact with the latter-day spirit of inquisitiveness, must afford food for some curious reflections. Obscurity, he may be pardoned for thinking, is both its own reward and a blessing in disguise.

Thoughtful people deplore the tendency of modern journalism to disregard the privacy and retirement of those who have the misfortune to excite public attention. What one thinks and does, and how and when it is done, in fact, most of one's life actions, are, by the present school of writers, laid bare to the public eye with the remorseless detail and exactitude of a dissector's knife. Whether the public appetite for this kind of pabulum is of spontaneous growth, or whether it has been artificially excited and stimulated, it would be difficult to decide. Suffice it, on this occasion, to note that photography takes a good half share in the process.

Side by side with the complaint that people are too prone to write about each other's habits and sayings is the lamentation that the world is suffering from over-illustration. It is remarkable to note the growth of illustrated newspapers and magazines during the last ten or a dozen years, in which time photo-mechanical processes of reproduction have become so immensely popular. Trite though the saying is that, were it not for photography this epidemic of illustration would not have assumed such formidable dimensions, it acquires increased significance when it is remarked that the growth scarcely seems likely to pause or be arrested. Could we but say that the quality of the work generally conformed to a high standard of technical and artistic excellence, it would be ungracious of us or any one else to complain of this prevalence of pictorial journalism; but, unfortunately, the haste and hurry of production is responsible for the dissemination of much which, either as examples of the capabilities of a process or of artistic taste, are deplorably, and perhaps unavoidably, poor. It is this fact, more than any other, which may tend ultimately to the comparative desuetude of illustrations in rapidly produced newspapers and periodicals, and which also at present makes it a positive relief for one to take up a periodical or a newspaper which is innocent of illustrations.

It is to the lasting discredit of photographers that so little of the purely photographic side of photo-mechanical block-making should have remained in their hands, and that virtually a new industry should have been built up on their lost opportunities. Nowadays the photographer has generally only the meagre and unprofitable satisfaction of knowing that of all the enormous number of blocks for the type printing-press that are daily made from photographs his share consists in simply supplying a print, whereas, under better-ordered conditions, the entire production of the block would and should have been h since, broadly, the whole, or, at any rate, most, of the work its production is of a photographic nature. It may be too l for our professional friends to profit by this unpleasant less in this particular regard, but it is to be hoped that the mo will not be lost upon them for future use.

We did not set out with the intention of administering lecture to men of lost opportunities, but of noting the p which photography plays in this age of universal publicity a notoriety. We happened the other day to be in the engravi department of an evening newspaper, and we noticed a sto of some hundreds of photographs of politicians and other we known people ready for reproduction as they should die or loo larger than usual in the public eye. Unquestionably the u of photographs in this manner has considerably interfered wi the publication business, which was once such a profitab feature with many firms. In all likelihood the same effect accentuated by the use of remarkably numerous half-to reproductions of photographs which are employed by t swarm of weekly illustrated papers of all kinds now bein published. Numbers of these papers will publish your po trait and biography on the slightest provocation, the indi pensable condition being, as we inferred at the outset, th you have done or are going to do something uncommon foolish. This is easy to comply with. If you are a lady, it sufficient that you should not be ugly or are going to b married; if a man, anything will do so long as it is som thing inconsistent with the decorous obscurity of oblivio If you have the good fortune to have an absolutely blan record, even then your case is not hopeless, for you can hav your portrait published on payment of a fee. The road to th fame of printers' ink is, in short, a delightfully smooth one and with easy gradients.

Photography, indeed, in descriptive records of our times an their people and manners, fulfils an office not inferior in effect if not in value, to the pen of the journalist. The one has un doubtedly grown to be the indispensable complement of th other.

We should like to feel that professional photographers ha benefited by the uprising of this new departure in moder journalism, but, as we have already ventured to say, we canno think this is the case. The reflection more immediately upper most in our minds, however, is whether this mania for photo mechanical illustrations, in its present severe form, has, on th whole, a healthy effect. Frankly, we think the public woul be better pleased with fewer and better pictures. Monotony and satiety will surely supervene when it becomes the rule for everything and everybody to be reduced to a common level of half-tone on zinc or copper. Are not the conductors of the numerous illustrated papers rather overdoing it in the matter of illustrations, and, in their eagerness to supply the public with what, we respectfully venture to submit, the public is probably getting tired of already, selecting subjects and persons for pictorial representation which few but a limited number care anything about? It is a significant circumstance that the most widely sold publications are still those devoid of illustrations. We should witness a decline in the number of photo-mechanical pictures with undisturbed equanimity if we thought that original portraits and views would thereby acquire an enhanced value. On the other hand, it is tolerably clear that photographs pure and simple have been much less in public demand since the means for reproducing them mechanically became so largely availed of.

Some people prophesy a revival of wood-engraving, and, as a re for over-illustration, there are many, we are sure, who ›uld welcome the reaction. The change is not unlikely to hastened by the inevitable combination of cheapness and ferior quality, which are the principal characteristics of popu- mechanical work just now. When it is borne in mind that an ›um of sixteen or twenty 12 × 10 half-tone photographic views at this moment selling literally by hundreds of thousands r sixpence, it needs no great amount of prescience to fore- ll that in the near future the very vulgarity—using the rm in its academic sense—of such pictures will in probability legate them to popular neglect. It is a thing which has ›ppened before, and will happen again. Perhaps, then, when ›e demon of cheapness has been exorcised from our midst, ›e professional photographer will hold up his head again.

QUALITY *VERSUS* SPEED IN DRY PLATES.

›URING a discussion on the determination of plate speeds, at a ›cent meeting of the Photographic Club, several interesting ›oints, as side issues, were mooted, and not the least important ›as that of quality. It was mentioned that what was a perfect egative theoretically, according to Messrs. Hurter & Driffield's efinition, would be of no practical value whatever. It was lso pointed out that plates tested by artificial light, and under he "standard" conditions proposed by some, would be tested nder conditions about as opposite as possible to those under ›hich they would be employed in ordinary every-day practice. ›s an instance bearing on this, recently we used some plates hat were marked with a very high-speed number; yet we ›und them to require quite as long an exposure in the camera, n order to obtain good printing negatives, as some others of a lifferent brand, which are not claimed by their makers to be ›f any great rapidity. We are, however, digressing, as, no loubt, this question will be duly dealt with by the committee ›ppointed by the Royal Photographic Society of Great Britain ›o investigate this subject, in their report, if one is issued.

Our immediate object is to direct attention to what seems ›o be drifting towards a race after excessive rapidity, as if ›hat were the only thing to be considered in dry-plate photo- graphy. In saying this, it must not be assumed that we for a moment think that the makers of plates with extreme rapidity lo not give every attention to the quality of the plates they ssue. It cannot, however, be denied that abnormal speed, in ›ome instances, is obtained at the sacrifice of some other quali- ›ies. It is to the users of plates rather than the makers that we refer. Just now, some persons, particularly amateurs with limited experience, seem to labour under the impression that the most rapid plates procurable are the best for them to em- ploy for all purposes and at all times, and, as a consequence, quality in the work often suffers.

For many purposes for which they are employed exceeding rapidity is quite unnecessary, and plates of more moderate sensi- tiveness would frequently yield, in all respects, better results, besides being more convenient and easy to work. It goes without saying that, the more sensitive the plate is, the greater are the precautions necessary in its manipulation, both as re- gards the time of exposure and the development as well as its protection from light in all the operations. It is, we think, generally conceded that the average amateur will get better negatives on slow plates, or on those of medium sensitiveness, than he will on those of ultra rapidity. Why, then, should the latter be used except when necessity compels? With the lenses with the large working apertures that opticians are now sup- plying, there is really less necessity for extreme rapidity than there was formerly. With a lens working with an aperture of, say, *f*-5 or 6, a plate of half the sensitiveness that would be re- quired with an aperture of *f*-8 will suffice to yield an equally well-exposed negative.

For the general run of hand-camera work, plates such as are now classed as being moderately—although a few years back they would be termed exceedingly—rapid are quite fast enough, while the images they yield are, as a rule, superior. In the majority of the fast plates now on the market, the image is exceedingly coarse and granular, and is not equal to properly rendering the fine details given by a good lens. Consequently, the small negatives are not so well adapted for enlarging from, or for lantern purposes, as if the emulsion were finer. It does not follow that excessive granularity is a necessary accompaniment of rapidity, as some of the quickest plates we have used—and made—have possessed a very fine grain indeed. But the fact remains that great coarseness is a very general characteristic of the quickest plates now met with commercially. It seems almost useless for opticians to give us lenses yielding such ex- quisite definition as they do if the plates we employ with them are incapable of rendering it in the negative; and this is frequently the case with some of the ultra-quick ones.

Vigour and perfect gradation are special characteristics in a perfect negative, and these qualities are more generally secured by average workers with plates of moderate sensitiveness than with those of exceeding rapidity. Again, it is generally admitted, alike with plates and films, that the more rapid they are the less satisfactory are their keeping properties. No one can gainsay the fact that a high degree of sensitiveness is an acquisition in a plate for many purposes, even when it entails the loss of some other qualities and requires greater skill to obtain the best results it is capable of producing.

The object of this article, as we have said above, is to point out to those who appear to overlook the fact that the quality of a negative, save in exceptional cases, is of greater importance than the rapidity with which it is taken, and that frequently better negatives would be obtained if slow plates, or those of moderate rapidity, were used instead of those of the extremely rapid type. It is well to have a power at command, but it should be employed with discretion when perfection of result is the principal object aimed at.

An Official Recognition of Photography.—It is seldom we notice such a gratifying official recognition of photo- graphy as in the following instance. A *brochure* is about to be published by the French Minister of the Interior which is intended to be distributed among the provincial mayors of France for pre- servation in their archives. It contains fifty pages of letterpress, reproducing the official account of the death of the late President Carnot, the description of the solemn obsequies, and all the addresses emanating from foreign governments, sovereigns, corporations, and municipalities, &c., which have been received by Madame Carnot or by the President of the Council. Five photogravures are included. They comprise a portrait of M. Carnot, a photograph of the President on his death-bed, a view taken of the Elysée, showing the public waiting to enter the *chapelle ardente:* and two instantaneous pictures of the funeral *cortège*, the one depicting it coming out of the Elysée, and the other the arrival of the procession in front o Notre Dame.

Carnot's Last Portrait.—In the last number of the *Photo-Journal* (Paris) M. Paul Gers, who, since 1889, accompanied the late President Carnot on his official journeys, has an article on "The Last Journey of President Carnot." It is illustrated by collotype reproductions of instantaneous views showing the funeral at various stages of its progress, and is prefaced by two views taken at Lyons on the fatal June 24. One of these shows the President emerging from the Colonial Section of the Lyons Exhibition, surrounded by his principal officers, &c. It was taken at twenty minutes past five in the afternoon, and is an excellent snap-shot, depicting the President smilingly conversing with a friend. It is the last portrait taken of M. Carnot before his assassination, which occurred the same evening.

The Combined Bath.—The experiences of M. Van Bosch, a Strasburg photographer, with the combined bath, may be interesting in view of the correspondence on the subject which has recently appeared in our pages. Out of 50,000 prints, made in 1892, on celloidin paper, he has lost about a third by fading, &c., that were toned and fixed in a combined bath. M. Bosch, of whose professional competence there is no doubt, affirms that all his manipulations were conducted with every possible care, that the proportion of lead in the bath was reduced to a minimum, that the hypo was renewed for every fresh five sheets, that the prints after toning and fixing were placed for five minutes in hypo 5:100, and finally washed for three hours. Notwithstanding all these precautions, the prints rapidly changed. M. Van Bosch then made his own paper, and imparted to it such properties as enabled it to stand washing for twenty-four hours. The result was no better; after a little while, the tones of the prints faded appreciably. Set against these unfavourable experiences of the combined bath are some in regard to separate toning and fixing, prints on celloidin paper so treated being after two years found to be as good as ever.

Comparative Sensitiveness of Plates.—Professor Zoeff has tested for speed by means of a sensitometer of his own invention (particulars not given) a number of plates of commercial manufacture. He gives the results. To obtain equal effect when exposing on a given subject, the following were the times required:—

Lumière plates	1 second.
Schleussner	2·2 seconds.
Weissbrod	2·5 „
Cramer (American)	3·3 „
Gebhardt „	3·5 „
Seed, 26° „	4· „
Perutz (orthochromatic)	8· „

Old Europe, remarks a commentator on these results, has nothing to fear from the so-called superior sensitiveness of American plates.

Something Like a Photographic Congress.—It can scarcely be said that the various conferences and congresses on photography that have from time to time been held in this country are productive of much ultimate benefit to photographic progress. The reason for this is probably that the programme partakes too largely of a hap-hazard character, and does not afford scope for the scientific and definitive treatment of the subjects selected, so that, at the end, one's feelings are those of the farmer who partook very copiously of claret. We have got, in fact, "no forrarder." When next one of these gatherings is projected, it might be advisable if the promoters took a hint from the programme of a Congress of Learned Societies, to be held in Paris next April under the auspices of the French Minister of Fine Arts. For the photographic section the following subjects have been formulated:—Photographing the infra-red of the spectrum, results obtained and suggestions for new methods; orthochromatic photography; photometry; theory of photographic objectives; shutters and lenses; the latent image; the preparation of grainless sensitive surfaces; organization of collections of lantern slides of educational value for circulation; astronomical and meteorological photography; photo-micrographic methods; the application of photography to the study of movemen Information of value is more likely to proceed from a programme this nature, arranged well beforehand, than from the hastily chose and usually stale bills of fare ordinarily served up on this side the Channel.

DUBLIN CONVENTION NOTES.—IV.

(*By our Special Correspondent.*)

How does it happen that "the Devil" has such deference shown hi in Ireland? Those who formed a contingent of the large party wh visited Glendalough and its seven churches on the Saturday o Convention week will not, for many years, forget the wondrousl beautiful "Devil's Glen," through which, leaving the cars, they wended their way on foot shortly after leaving—oh, with what re luctance!—the Walpole Gardens, kindly thrown open to the party These gardens, exclaimed one enthusiast, "exactly fill the bill." An they do so; for here are rare and beautiful plants, trees and flower in profusion, and seemingly in the wilderness of nature, without th eye being offended by the geometric designs in which so many de light, although some master mind of strongly developed artistic pro clivities appears to direct it all; a stream runs through them with richly adorned banks and miniature bridges.

To take a jump from a scene like this to the Devil's Glen is, indeed, to jump from Alpha to Omega at a bound, for the Glen is a veritable glen, "only more so." It is a deep ravine between two mountains, clad with arborescent vegetation from summit to foot, a narrow river dashing its way at the base, along which trees and ferns struggle for the mastery. How many cameras were unlimbered in this glen it were vain to tell.

Here I would interlard a bit of advice suitable, not alone for this, but for innumerable parts of Ireland. If your main object is photographing the scenery, don't go with a party, but go alone or with a congenial friend or two; and, above all, don't tie yourself by *having* to be at any special place or hotel at any particular hour, or even day. The Walpole Garden and the Devil's Glen are themselves good for six or eight hours and several dozens of plates.

But, talking of the entity just mentioned, the Devil's Punch Bowl, which is situated many miles away from his glen, being, in fact, above Torc Falls, Killarney, is another grandly wild place, which, to many photographers I know, would be looked upon as a paradise, despite the shady character of the reputed owner. The punch emanating from his bowl supplies Killarney with the fluid with which the natives and tourists dilute their John Jamieson and cognate brands. But Killarney itself must be allowed to remain over a little while longer.

I learn, from what I believe to be an authentic source, that the financial success of the Convention is greater even than was understood to have been the case at the closing meeting. I dare say, however, we shall have full details as to this after the Council shall have met and gone through the accounts. Being now flush of funds, it will, I hope, continue the good work it begun at Plymouth last year, and recoup all the outlay incurred by a certain Society that some years ago, acting with the best intentions in the world, overran the constable to an extent that rather seriously interfered with the pocket comfort of some of the members.

Dublin, according to an authority that must not be assailed, is "the say-bathingest, the tay-drinkingest, the car-drivingest place in the world, and bates the warld for divarsion." But, to utilise his lordship's grammar, the cars are the unsociable-est vehicles in creation. Just think of driving about for a few miles with your best girl, seated back to back, and having to hold on like grim death for fear that a bit of uneven road or a nubbly stone causes one or the other of you to be pitched out on the roadside. Irish jaunting-car riding

requires an education, and the vehicle itself—the sweet low-backed car that one admires so much in song—is a fraud. You bark your shins on the step in getting up, and cramp your arms with having to hold on, while, in the event of getting thrown overboard, your countenance runs the risk of being damaged. But the jarveys are clever if reckless, and the horses sure-footed, while the Irish roads—such, at any rate, as I was privileged to see—are truly excellent. I did not hear a whisper against any of our British institutions all the time I was there; so, as no antagonism exists, why, on earth, don't they make a wholesale importation of English hansoms, or even "growlers," in which one can ride at ease and in peace, and, I may add, under shelter when the rain falls? A hansom will carry two individuals comfortably, together with all the photographic traps they will require on a lengthened outing; you can smoke to your heart's content, and see the country as you go along, and what more can one desire? There, I've said enough in revenge for a mark on my shin-bone, which is still discoloured, so will let the subject drop.

If a photographer has a *penchant* for archæological remains, such as old castles and abbeys, Ireland is just the country in which to locate for a couple of months or so. Judging from the enormous number of these, it must have been at one time a veritable hotbed of internecine war on the one hand, and religious worship on the other. But there are other antiquities than those of a military and ecclesiastical character; of these the numerous round towers and cromlechs will immediately suggest themselves. Opinions are divided as to the origin of the Round Towers, and at present it is not necessary for me to say more than give mine, which I have long held—viz., that they are a development of a religion once prevalent some ages since, and which attained another stage of development in the graceful spires that now adorn so many churches of the present era.

Apropos of round towers, fancying I saw one at a distance in the south-west of the island, I asked the jarvey if that was a round tower. "Indade, and it is that same, sir," he replied; "only it is not round, but square, and it is not exactly a tower, but only the chimney of Blank's factory works, that we can't see just from here."

ON THE DEVELOPMENT OF UNKNOWN EXPOSURES.

Within recent years a very large number of ladies and gentlemen, who merely take to photography as a pleasurable pastime, have relinquished the idea of developing their own exposures, preferring to send their plates for this purpose to a dealer or professional, the result being that during the summer and autumn months many professionals find themselves face to face with large batches of plates for the purpose of development, the particulars of which, in so far as the class of subject exposed upon, or any other equally important factor in the operation of development, is entirely unknown to them, for the sum total of information communicated is generally, "There are so many plates here I want developed, some of them are time and some of them shutter exposures, but they are all mixed up unfortunately;" and so the poor operator is left in total ignorance of much that is essentially necessary to know, with the view of being able to overcome the work with anything like an even moderate degree of satisfaction and the possibility of obtaining satisfactory results.

Others, again, with a fastidious turn of mind go to the opposite extreme, and are seldom satisfied with any results, no matter how much trouble and pains an operator may have expended upon the development, for it is no uncommon case to meet with those who consider every operator ought to be able to develop all plates in such a manner as to retain some beautiful sky effect at the same time as to bring out a most impossible amount of detail in cases of hopeless under-exposure.

Is it any wonder, therefore, that many professionals have come to the determination to decline work of this description, which at all times must carry with it much trouble and unpleasantness?

With the dealer, however, the case is somewhat different, and the development of amateurs' negatives has come to be quite a large branch of their trade, for there is the after-printing of such negatives, which invariably follows anything good enough. It is curious, however, to find some dealers actually saying that they do this sort of work merely to oblige their customers, for it is well known that at all times it is a most unsatisfactory job. Photography, however, as a pastime, must be made comfortable to a very large class who can afford to pay for it, and hence the now very common practice of sending not only their negatives to be developed, but almost everything else connected with the work, even to the filling of the dark cells, and I shall not be surprised to find before long that club-rooms and premises will be started, where, under safe lock and key, a lady or gentleman can store away their entire outfits under the care of a competent keeper. Something after the style of the left-luggage office arrangement, with everything to be ready wanted.

Is it any wonder, therefore, that, after a hard day's work at other branches of their business, a dealer or professional is not in the very best frame of mind to tackle the development of a large batch of plates, the particulars of which are entirely unknown to them, with the almost certain result that a considerable amount of carelessness is almost sure to attend the operation? Failures, of course, there are innumerable, perhaps far more failures than successes; but, then, they are all charged for so much per dozen, and the blame is often, if indeed not always, thrown back upon the lady or gentlemen themselves, who, as a rule, put it down to their own ignorance; but, if they even get a few passable results, they are quite well pleased. And so the game goes on, being good for the plate-maker and dealer, and affording a spice of pleasure to the every-day life of the novice, who can well afford to pay for it, and who does not expect to turn out work quite equal to high-class amateur or professional productions.

I have said that in many cases the fault does not lie entirely with the lady or gentleman who exposes the plates, and that, as a rule, a certain amount of excusable carelessness is almost sure to attend the operation on the part of the operator who develops them, for how many dealers have even dark-room accommodation sufficiently large to properly undertake the development of a large batch of plates, say, even half a gross of the modest half-plate dimensions? and at this season of the year such is by no means an uncommon quantity to have gathered together from different sources for development, and, of course, very many of these are wanted in a hurry, so they must be all rushed through there and then somehow.

With the professional, having a large and well-appointed developing room, the case is quite different. A quarter or half a gross of half-plates are developed in batches of from six to a dozen at a time of an evening, after the push of business is over for the day, without almost a single failure, and everything goes like clockwork, because the developer is made to suit the exposures, and the exposures are carefully selected in similar cases. And, further, special accommodation in the way of developing sinks and dishes is at hand to cope with such large quantities. But how many dealers possess developing rooms of this description? As a rule, it is some dark cupboard, merely rigged up for the purpose of changing plates *only*, but which eventually has to do duty as a developing room, for which purpose it is totally unfit when large quantities of plates have to be dealt with. Is it any wonder, therefore, that failures are more abundant than successes, when such is made to do duty for a well-appointed developing room, for what facilities can an operator have in such dens to cope with the difficulties he is sure to meet with?

How best to contend with this new feature in amateur photography becomes a question of no small importance, and is one that professionals and dealers alike ought not to ignore, for there is money in the work, and, the more satisfactorily it is performed, the more profits will accrue to the poor professional in these dull times. Whilst, as to the dealer, there can be no doubt that the turning out of the greatest possible percentage of good results will most certainly go a long way towards the inducement on their customers' part to continue the practice of this most delightful hobby. Whilst, on the other hand, failure after failure can only tend to one result, viz., the sickening of their customers and a discontinuance of the practice of photography.

Among the first essentials necessary to success is a large and well-ventilated dark room. *It must be a room in every sense of the word.* It is no use trying to turn out large quantities of good negatives from a dark box or cupboard, where the operator is cribbed and confined to a ridiculous extent. Such may be made to do duty for the purpose of developing one or two quarter-plates at the outside; but, when it comes to dealing with large quantities, the case is totally different, for special preparation and facilities must be at hand; otherwise an operator has no power to deal with the ever-varying behaviour of almost every plate that is being dealt with; for, if, even when dealing with plates of which a reasonable amount of information is known, the development becomes a matter of no little trouble; how much more so when the operator is in total ignorance of everything concerned? And these unknown factors are not a few.

First, there is the plate used. Sometimes, indeed, an operator may from his experience be able to make a fair guess at the particular brand that comes to hand; but it is only a guess at best. But what about the rapidity? and nowadays, in all conscience, the makers are making them fast enough.

Then, what about the class of subject each plate has been exposed upon? for there are wide differences between subjects, such as groups with ladies clad in light summer costumes, and dark landscapes with overhanging cliffs; for the amount of pyro suitable in the latter case would hopelessly spoil a subject in which delicate draperies have to be considered.

But it is needless to enumerate the ever-varying class of plates and subjects; any intelligent photographer must know that it is by no means a difficult thing to spoil a negative in development by the use of too much or too little pyro, or whatever other developer is used.

Then, there is the bother of under or over-exposure to grapple with, this alone necessitating a keen perception and the utmost rapidity of action to counteract.

Such are among a few of the many difficulties, and there are countless others that present themselves in unknown exposures. Truly, when dealing with such, an operator's lot is not a happy one, and it is no wonder that after a hard day's work he looks with dread when having to tackle a batch of such. T. N. Armstrong.

REMBRANDT LIGHTING.

[American Journal of Photography.]

Rembrandt and shadow, shadow and Rembrandt. Have they not almost become synonymous? Is it perhaps just that Rembrandt should have become so associated with shadow, because no other painter probably has left so many works of art in which shadow predominates to so great an extent? But, strange as it may seem to those unacquainted with his work, he was withal a clear, brilliant painter, in nowise obscure, or smudgy, or heavy. When I say brilliant I do not mean brilliant in contrasts of colour, for he dealt little or not at all in primitive colours, though at the same time a warm, clear, transparent, powerful colourist; but brilliant contrasts of light and dark, for it was by the very preponderance and depth of his shadows that he secured so much brilliancy in his lights.

Rembrandt, in addition to his quality of force of effect, always told his story powerfully, because, by subordinating the greater portion of his canvases to comparative security, he succeeded in concentrating the attention of the spectator upon the particular group forming the incident of his work. The power of drawing the attention to the chief incident of a work of art is a happy one to its possessor. As in literature, in oratory, and conversation even, the author or speaker who is rambling and discursive, who does not gather together his ideas and state emphatically the gist of his tale or argument, will never make the impression that the more fortunate genius will who sets you at once in understanding and in sympathy with the point of his story. In art, and necessarily in photography, this quality of conveying forcibly the intention of the work, is dependent almost solely upon composition and light and shadow, and this is why it is that it is so important that the photographer should have a thorough understanding of the simpler truths at least of composition and effect. Both of which qualities Rembrandt was master of.

It matters not whether the subject attempted is of the simplest kind, a half-length portrait or an arrangement composed of many people, the opportunity arises in either for the display of ease, and grace, and force, or of awkwardness and insipidity. Rembrandt, it must not be forgotten, was dependent as much upon his composition as his light and shadow for his fine effects, because any amount of contrasts of light and dark would have availed him nothing had he not so judiciously placed them in his work that he gave them an agreeable form, supported them, and contrasted them to the utmost advantage.

Rembrandt, being a master in the management of light and shadow, is unquestionably one of the best guides for the photographer, whose art is at present presented to us only in light and shadow, but he must be carefully and understandingly studied in the engravings and photographs of his portraits and paintings, and in his etchings. It will not do to pose a sitter against a dark background, and, throwing the face wholly in shadow, make a photograph, and feel that you have secured a fine Rembrandt effect, for the chances are a hundred to one that you will get an exceedingly poor, dark, unimpressive picture. Such posing and arrangement might be admissible if you had a certain kind of delicate subject to deal with, with refined skin—light hair and a fine outline contour—the hair and garments being properly and gracefully arranged and the background very dark, and a skilful timing given, so that there would be a certain degree of brilliance of all the greatly predominating shadows which rested upon the subject. With a graceful, crisp and brilliant outline, supported by luminous shadows, a very agreeable effect is attainable. But such a lighting is only a Rembrandt lighting in the sense that the amount of high light in the picture is exceedingly small in proportion to the amount of deep shadow and half shadow, for Rembrandt in his portraits and picturesque heads almost always adopted the full, broad lighting which has always been the favourite mode of eminent painters, and when he has departed from this the effect has never been so powerful or agreeable as when the better mode was chosen.

There is nothing easier than for a photographer to experiment in these matters. His experiments are not necessarily the work of hours or days as with painters. At any time when he happens to have a little leisure he may pose some one about his place, and in a few minutes make a number of negatives of trial arrangements in various lightings. Let him pose any ordinary dark-complexioned person against a moderately dark background, throwing the face of the sitter in shadow, and, making a careful photograph of the subject, see, on careful comparison of it with any good work by Rembrandt, whether it can fairly be called a Rembrandt effect otherwise than as a joke or mere travesty. This sort of thing has, in fact, been so much done in a serious way, and many persons are so captivated by the simple novelty of anything, apart from its intrinsic merit or value, and by big-sounding names, that a sight of work has been turned out as Rembrandt portraiture that is the vilest trash, and a libel on the great man under whose name it is passed off upon the public. Rembrandt was an indefatigable worker with his brush and his etching needle. He seems to have left us nothing in the way of writing by way of extending or elucidating his ideas, but he has certainly left us an abundance of demonstration of the particular bent of his mind. He understood that light may be luminous and brilliant in two ways—namely, by its great expanse and all-pervading influence, and, on the contrary, by its contrast with an almost overwhelming amount of shadow. He chose and adhered to the latter principle for the embodying of his ideas, and certainly with great success, for he never was in any way remarkable for either grace or beauty in his works. Indeed, there are critics who consider him without the pale of the eminent painters, because in his Scripture subjects he has none of the classical refinement of the great Roman painters; but this is uncharitable, because his work was always earnest, and there is a certain calmness and repose in it which makes it impressive. Solemnity and sadness are wrongly associated with his work. A mistaken impression prevails that he was of a sad and miserly turn, and that much of what he did impresses us as terrible and mysterious, which ideas are entirely wrong, and cannot in any way be sustained by careful observation of his works, and comparison of them with many others, as Salvator Rosa and Michaelangelo Caravaggio, for instance.

Many of his pictures, which are made up of more than three-fourths deep shadow and half shadow, give the most calm and agreeable impressions, representing as they do domestic interiors with a stream of sunlight coming into an apartment, upon persons quietly and comfortably reading or performing some household duty, giving the pleasurable sensations of cheerful repose and comfort. To work like Rembrandt is not to throw your whole picture into obscurity, burying the choicest features of your composition equally with the surroundings in shadow, but to bestow the most vigorous light and shadow upon your principal feature or group, and to have the light so cast or directed that it will reveal the very best modelling, and then surround it with a very large proportion of half shadow and deep shadow, thereby giving it brilliancy and consequence.

The introduction of a proper amount of half shadow is an important consideration not to be overlooked in endeavouring to attain Rembrandt's effects. High lights amidst deep shadow must invariably produce hard, dry, spotty effects without a fair amount of half light and half shadow to soften them off, or lead them gradually into the deep shadow. Some of the artists of Rembrandt's own time, or a little later, in endeavouring to imitate his powerful, impressive style, overlooked the importance of sustaining half lights and half shadows, and instead of producing his broad mellow effects got only hard, dry pictures.

One of the greatest difficulties the photographer has to contend with is to overcome harsh, ill-shapen outlines, where masses of light drapery or other light objects cut against passages of dark. It is so easy for the painter, by a careful disposition or by the addition of a little shadow, to soften down such harsh outlines. Many a photographic composition which would otherwise make a very attractive and agreeable picture is ruined by the high lights taking the most obnoxious forms, and being highest on the very edge, where they come in contact with the dark surrounding them, instead of a little back from the edge as the artist

would have it. On this account the photographer should, whenever opportunity permits, for he will not always have the necessary time to bestow upon it, be very careful about the disposition of the apparel, especially in female portraiture. If he devotes attention to the matter, and will look at much of the photographic work published, he may amuse himself by finding the numerous instances wherein ladies' dresses, chairs, and background accessories war with each other, and vie with each other in the ugliness of their shapes and the harshness of their outlines. Rembrandt lighting is here to be brought into play. The ugly forms are as far as possible to be reduced in importance or obscured by throwing them into shadow, and the most agreeable forms that we have to present are to be allowed to stand out in full brilliancy.

Let all photographers study carefully the works of Rembrandt. Let them go to the fountain head, and look at the best that they can get hold of that is published from his paintings and etchings, and especially his portraits. Do not take him at second hand, for there has been much misconception in regard to his qualities as an artist, and they will certainly be greatly benefited, for the scope of the photographer is immense in light and shadow, and Rembrandt is one of the great expounders of light and shadow in art.

XANTHUS SMITH.

HOW MR. F. HOLLYER WORKS THE COLD BATH PLATINOTYPE PROCESS.

[Photographic Society of Great Britain.]

BEFORE going into details perhaps it would be serviceable to some of you if I were to tell you the course I pursued in learning the craft of platinotype printing. In 1878 I made up my mind to abandon silver printing, and being convinced of the permanency of platinotype and charmed with its colour and tone, I determined to adopt it. I first got rid of my silver printer—then put all silver baths, some gallons, in the waste tub and cleared all away, and refused to accept any work unless it was to be executed in platinotype—then I set to work and printed on an average about two quires of paper a week. This I did for some two years, doing the entire work myself—winter and summer, wet or fine. At the end of the two years I was pretty well master of the subject. This method of learning is simple, but requires a good deal of endurance and patience. If I can assist any one to lessen the time in learning, I shall be pleased, and give you a few points and details which I have written out in their order.

No. 1. Don't finger the paper on the front more than you can help, especially this hot weather.

No. 2. Dry the pads bone-dry, over a gas-stove or otherwise; for, even in the driest weather, it is necessary to use heat. The drying is necessary for two purposes—damp is detrimental to the paper, and also if the pad is not dry it causes bumping. I use Wandle felt for pads, of which this is a sample. I have tried indiarubber, but was not satisfied.

No. 3. Exposure:—For that diffused light is to be preferred, direct sunlight has a tendency to cause solarisation and other defects. Of course this is open to modification, as sunlight in November, December, and January is much to be preferred if you are lucky enough to get it, as it is not well for the paper to be too long in the frames.

No. 4. In judging how far to carry the exposure:—This is a thing I cannot tell you, and is only to be learnt by experience, for the conditions are so varied that it is impossible to give definite instructions. First of all there is great variation in the paper; some papers are hard with close texture—others are looser in fibre, less heavily sized, not so absorbent; and again much depends on the negative—whether strong in contrast or otherwise. I pass round some prints showing how far the exposure has been carried. It will be, I think, a good plan to tear some of these prints in half so that the results may be compared after development. The only safe way of determining the exposure is to expose, develop, and dry off one print first as a guide to the rest.

No. 5. After exposure roll the prints face out and put in the storage can. I have brought one of my own design—it has a receptacle for calcium—and fitted with a valve worked by the foot so as to let the air out when closing the lid.

No. 6. Development:—I use a saturated solution of oxalate—made with boiling water in a large jug—stirred up with a stick while the boiling water is poured on, and left to settle. I prefer a bath that has been often used, strengthened when necessary with the saturated solution from the jug, or you can throw in a handful of oxalate to the developer while hot. As regards temperature of bath, that is important, and can range from 130 to 170 degrees according to results required; if over-exposed a low temperature may save the print—if under-exposed a high temperature is necessary; again a print from a flat negative is improved by slight printing and a very hot bath. I prefer floating the print, keeping the back as free as possible from the oxalate. There is one thing not to be forgotten—there is generally a black greasy sort of scum formed on the top of the developer, which can be easily removed by dragging a slip of paper along the top slowly and carefully. The formation of this scum is uncertain—sometimes much and often—sometimes otherwise—but must always be watched for and removed when required; for when once this scum gets on a print it is almost impossible to remove it. Always have a sufficiency of developer in the dish, especially when developing a large number.

No. 7. Clearing:—Hydrochloric acid, 1 part to 60 or 80. The acid should be pure and water-white; the yellow, or commercial, quality should not be used. Let the prints remain in the acid for about ten minutes, and then give them a second bath for the same time. The Company, I believe, recommend a third bath; but I do not think that necessary, unless you have a large number of prints. It is advisable to turn over each print a few times in the acid baths, being careful not to drag the prints hard against one another or against the bottom of the bath, as they get rather tender in the acid and apt to rub.

No. 8. Washing:—The object of washing is to get rid of the acid; for that use about three or four changes of water—thorough ones—turning the prints over carefully during each change, and draining between each. In the matter of washing, everything depends on the number of prints and the depth of the washing trough. I use one of Doulton's earthenware sinks, with a plug, and find four changes sufficient. I don't know that I have anything further to say, and will now show you how we develop large prints. The developing dish I had made according to my own pattern by Doulton. It is simply fitted into a zinc trough and heated by a length of iron pipe with holes punched in it, with air inlet. I may mention, for washing, that I do not use a wooden tray like this in every-day work, but a large Doulton sink; earthenware is in every way better to use, as the bottom of wooden vessels may be rather rough, and apt to rub the prints. In making this little show of developing, I may mention that half the number of prints are on a new kind of paper, with a rough texture. It is very beautiful in colour, and gives deep, rich tones; but I cannot give any decided opinion on its workable qualities until I have had further experience. I think this new paper will turn out well, and sincerely hope so, for it is made in England.

F. HOLLYER.

CAMERAS AND CHINAMEN.

[American Amateur Photographer.]

THE era of cheap but fairly good cameras seems to have begun with the year 1894. Jena glass has helped reduce prices. It is said that Yankee ingenuity has devised machinery for lens-grinding which enables Americans to turn out a better lens than that formerly produced by hand in Germany, at one-quarter the cost. At any rate, the writer has taken good $2\frac{1}{2} \times 2\frac{1}{2}$ portraits and landscapes this year with a twelve-plate magazine camera, which cost, complete, just three dollars. Five years ago the lens alone would have cost ten dollars. For twelve dollars, retail, a folding 4×5 camera is made, with one double plate-holder, with room for two additional holders. It is substantially covered with leather, finished in mahogany, has a finder, strap, shutter, &c., and is said by the responsible manufacturers to equal folding cameras in the market which have recently been selling as high as fifty dollars. This twelve-dollar camera takes excellent pictures. A year ago I doubt if the same camera could have been bought for forty dollars. Whatever have been the causes for camera reductions, either competition, new glass for lenses, or other reasons, there is likely to be but one result, and that is, the increase in the number of photographers, or would-be photographers, and not necessarily a decline in the quality of the work produced. On the Pacific coast, for instance, low-priced cameras are attracting Chinamen. Chinamen, as a whole, at home, are classed as a non-progressive people. As a whole, they may be slow.

They are sure, though. A Chinese cook in a San Diego house noticed the writer washing negatives. This "heathen," who was supposed to know nothing but the art of cookery, sweeping, and bed-making, became interested in the pictures and quizzed the amateur, and modestly asked to be instructed in camera work. He next bought an outfit, with a three dollar and a half lens. After practising at odd moments by himself for less than a fortnight, John Chinaman amazed his instructor by exhibiting prints far superior to those made by his teacher, who used a forty-dollar lens. That Chinaman wanted a wife. So he packed up his belongings, and is now in China with his valued camera, where he is probably doing a lucrative business photographing the relations and neighbours. A second Chinese cook is now asking me questions almost daily about the ins and outs of camera work. He fairly itches to begin, and, as soon as he can satisfy himself that the game is worth a week's wages, the amateur photographic world will be enlarged by one—one whom Uncle Sam certifies to as being duly registered under the new law and worthy of belief because a photograph of this cook is attached to the certificate. It is not improbable that this retiring, soft-spoken, inquisitive "heathen" will, in the near future, create a sensation among the amateur camera sharps of the East by displaying his work at the leading exhibitions.

Chinese disposition seems well adapted for photographic work. The

Chinaman is neither fretful, hasty, nor careless. He is thorough. He takes in knowledge slowly. It is well digested and sticks. So it is with the Japanese, whose pictures are superb. If ever China becomes a nation of photographers, the rest of the photographic world will have to look to its laurels. M. Y. Beach.

COLOURING PHOTOGRAPHS.

[Anthony's Bulletin.]

All readers of photographic literature are cognisant of the attempts that have been made to produce pictures direct in natural colours. No matter how satisfied the experimenters may be with the results of their labours, the fact remains that, as yet, these results are not of practical value. If a coloured photograph is wanted, the professional photographer must have recourse to brush and colours in order to imitate Nature.

In the colouring of photographs several improvements have recently been made, and we will endeavour to give some practical hints on the technical part of the process, leaving the artistic side to some other writer.

Prints are seldom made upon salted paper, but mostly on paper coated with some other material, which gives more detail and brilliancy, while increasing the difficulty of colouring. The smooth surfaces of the Aristo papers, for instance, will accept hardly any water colour, while the coating of gelatine emulsion papers is easily injured by moisture. These evils can only be removed by suitable preliminary treatment. The following method has proved to be of real practical value: Gelatine prints, which would suffer by moisture, are treated with alum after fixing. After being mounted and retouched with albumen colours, the picture is flowed with filtered albumen, to which a few drops of ammonia have been added. When fairly dry, it is passed through a burnisher. The albumen, if not previously completely coagulated, will now become sufficiently solid for use. This albumen coating admits of the use of all water colours.

For Aristo and all collodion paper no preliminary preparation is required for transparent colours, but when using water colours it is necessary to give a coating of varnish. The picture preserves its brilliancy, and the colouring matter may readily be applied.

In the colouring of photographs a distinction is made between covering and transparent colours. The former are the ordinary water colours in tubes or cakes, while the transparent colours are liquid. By a careful combination of the two, the most brilliant results are obtained. The colours are applied in such a manner that all the half-tones and details of the picture are covered with transparent colours, while the deep shadows are painted with a covering colour, to which some albumen may with advantage be added. In the category of covering colours we may list cobalt, Prussian blue, cadmium yellow, yellow ochre, green earth, Mars yellow, India red, umber, burnt sienna, and Chinese white. The finely powdered colours are mixed with a suitable binding medium preferably—

Filtered albumen	100 c.c.
Ammonium carbonate	5 grammes.
Glycerine	3 c.c.
Liquid ammonia	4 „
Water	25 „

This mixture, if well cooked, will keep a long while, and answers all requirements. The colours thus prepared adhere well, are sufficiently transparent, and may even be burnished. The transparent colours may be worked without considering light and shadow, these being sufficiently well marked in the print. The colouring of the flesh is sometimes rendered difficult because of the spotting, which may be removed by the paint. The previous application of a little albumen is recommended. The background requires particular care. It should be well graded, and should harmonise in colour with the subject; greenish grey and medium grey colours may be used with advantage. The gold ground is also used quite frequently as background. This can be made quite easily by coating the background with thin mastic varnish, following the outline of the figure. When half dry, powder it uniformly with fine gold bronze. When the varnish has become thoroughly dried, remove with a brush the excess of gold bronze. Backgrounds with distinctive design should be painted in a subdued tone.

Albumen prints can also be treated with covering colours. It is only necessary to collodionise the coloured picture. For this purpose use a three per cent. plain collodion. Such a picture can be burnished. Collodion prints do not require any such treatment; indeed, flowing with collodion would be injurious. J. Joé.

SPECIAL IMAGES OF THE SUN GIVEN BY SIMPLE RAYS CORRESPONDING TO THE DARK RAYS OF THE SOLAR SPECTRUM.

Hitherto the surface of the sun has been studied merely with ordinary telescopes, refracting or reflective, the images of which are formed by the totality of the luminous or photographic rays. But, as the continous spectrum of the sun is furrowed by very numerous dark rays, the preceding images are due in great part to the simple rays of the brilliant intervals between the dark rays, rays which, being united, give merely a mean result. Thus I have already proposed (*Comptes Rendus*, December 26, 1893) to study the sun with each ray, brilliant or dark, but isolated, in order to recognise the successive layers of the sun and its atmosphere which have been revealed at the margin by total eclipses, but which at ordinary times escape us, especially in the part projected on the disc. These strata of the sun, by the play of their emissions and absorptions of light, produce those inequalities of the spectrum, which, on the other hand, may serve to disclose them.

I have the honour to present to the Academy the first results obtained in this novel manner. The apparatus employed consists of a siderostat, an ordinary object lens, and a registering spectrograph with two slits, which gives the image of any source in monochromatic light on the general principle established by M. Janssen in 1869.

1. *The Most Brilliant Rays.*—I have at first isolated with the spectrograph a brilliant interval between the dark rays; the image obtained, as it might be expected, is that of the ordinary telescope used alone. It shows the photosphere with the spots and the faculæ, which are especially brilliant at the margin. I have found merely that in the luminous region, the only one studied, the distinction between the brilliant ground of the disc and the spots and the faculæ is more marked for the more refrangible rays.

2. *Brilliant Rays of the Vapours of Calcium.*—They must be put aside, for they are reversed and given off by substances not liquid or solid, as in the former case, but gaseous and placed higher in the sun. They give, with the spectrograph, as I have shown formerly, the image of the entire chromosphere of the sun as it would be seen isolated from the photosphere. The brilliant regions agree generally in form with the faculæ of the photosphere, but with the same brightness over the whole surface, at the centre as well as at the margin, and with a greater extension, which often hides the spots the penumbra of which is in general not marked.

3. *Rays Relatively Sombre corresponding to the Dark Rays.*—With the spectrograph employed the brilliant ray of calcium has a breadth of 0·06 mm. to 0·07 mm. But the broad, dark ray of calcium, which includes in its midst the brilliant ray, is on each side at least 0·35 mm. in breadth. But, if we isolate with the second slit apart of the broad dark ray, we obtain, after a slightly longer exposure, a result curious and different. The brilliant regions of the facular flames still appear at the same points of the disc, but less intense with reference to the ground and less extended, sensibly of the same brightness at the centre and at margin. The spots, on the other hand, appear distinct and not clouded, with their penumbræ well marked. I have still obtained images similar in their general lines with the other dark rays (iron, aluminium, calcium, carbon) sufficiently broad to be isolated with the spectrograph. Here is a new general fact peculiar to these dark rays.

These images of the dark rays are intermediate between the images of the photosphere and of the chromosphere. In fact, they are given in great part by the solar strata productive of the dark rays, which probably belong to the photosphere as well as to the chromosphere, and which in any case occupy at least the lowest part of the chromosphere, called by English writers *the reversing layer*. These strata appear, in fact, brilliant, and reversed in total eclipses during the two first seconds of the totality, according to the observations of Young. As they have a small height, at most a second of an arc, they are immediately hidden by the movement of the moon during the eclipses, and cannot be studied with the spectroscope at ordinary times. The images of the sun given by the simple radiations of the dark rays enable us to study the distribution and the intensity of the corresponding vapours which have so far escaped observation, and they open up thus a new track for research.

The spectrograph employed, which is that already described for photographing the chromosphere with the brilliant ray of calcium, is of too feeble a dispersion to permit the isolation of the very fine rays of the spectrum.

The vapours of calcium present a great interest on account of their triple inversion, which announces three different layers superimposed in height. The two lower layers corresponding to the broad dark ray and the double brilliant ray have been already obtained. It is requisite to search for the image of the third layer, the nearest to the corona, given by the small dark central ray. This last image, according to the results already furnished by the sectional spectrographs, will not present all the brilliant regions of the lower strata. It will permit us to create among the facular frames a distinction useful in the study of the solar atmosphere around the spots.—*Comptes Rendus*, cxix. p. 148.

H. Deslandres.

News and Notes.

LEYTONSTONE EXHIBITION.—At a meeting held on Friday last it was decided to hold the third Annual Exhibition at the Masonic Hall, High-road, Leytonstone, on Thursday, Friday, and Saturday, November 29, 30, and December 1. Twenty-three medals will be offered for competition—one gold, five silver, and five bronze in the open classes; six silver and six bronze in the members' classes. The Hon. Secretaries are Messrs. Fred. W. Wates and George H. Cricks, The Studio, High-road, Leytonstone.

EALING PHOTOGRAPHIC SOCIETY.—An Exhibition will be held on November 21 and 22, 1894, at the Prince's Hall, Public Buildings, Ealing. The following are open classes:—(*a*) Champion for previously medalled pictures. (*b*) Pictures not previously medalled. (*c*) Lantern slides in sets of six. For members only:—(*d*) Pictures by members who have previously won a medal at any Exhibition for the class in which they exhibit. (*e*) Pictures by members who have not competed successfully in the class in which they exhibit. (*f*) Lantern slides in sets of six slides. Medals (silver and bronze) will be given in each class at the discretion of the Judges. The Hon. Secretary is Mr. R. Y. Murphy, 7, Argyle-road, Ealing.

AN IMPORTANT DISCOVERY.—In the section on Chemistry and Mineralogy (British Association), under the presidency of Professor Dixon, a newly-discovered constituent of the atmosphere was announced by Lord Rayleigh and Professor Ramsay. Lord Rayleigh calls the new constituent a gas characterised by extreme inertness. So far no characteristic chemical reaction has been found, but his Lordship has obtained as the value of the density a number, namely, 19·09. This result is probably low, the continued sparking showing that there is still some nitrogen present. Experimenting in company with Professor Ramsay, he has obtained something like 100 centimetres of the substance. Sir Henry Roscoe led off the discussion, which was of a complimentary character. Professor Emerson Reynolds, Dublin, pointed out that there was room for three spaces with an atomic weight of between nineteen and twenty-three, Mandeléeff's table.

THE ART COLLECTION AT GUILDHALL.—The Library Committee of the Corporation have published their report on their recent art collection at the Guildhall. The paintings exhibited formed a collection calculated to command the appreciation at once of the connoisseur and the public at large. Many of the pictures were brought from far distant parts. The exhibits were on view during April, May, and June, and all the pictures were insured at Lloyd's. In all, 300,366 persons passed the turnstiles, being an average of 3580 per day. In obedience to the instructions of the Court of Common Council, the Exhibition was opened to the public on alternate Sundays between April 22 and July 1. The total attendance on the six Sundays was 17,530, showing an average of 2921 per Sunday. On each occasion the greatest order prevailed, no single instance of damage or disturbance having occurred. The descriptive and historical catalogue, prepared by Mr. A. G. Temple, the art director, was much appreciated, 38,569 copies having been sold at the price of 6*d.* each, realising the gross sum of 964*l.*, a sum which had been found not only sufficient to defray the entire cost of the catalogue, but to leave a balance at the Committee's disposal which would enable them to dispense with the greater part of the amount of 450*l.* granted by the Corporation to defray the expenses of the Exhibition. The Committee conclude by referring to "the excellent, experienced, and skilful manner in which Mr. Temple, the director and secretary of the art gallery, has discharged his duties, and the marvellous success which has attended his exertions by the organization of the three art loan collections in Guildhall." The total net cost of the Exhibition seems to have been 443*l.*

DEATH OF A SCIENTIST.—At a late hour on Monday, last week, there passed away at Rock Ferry one who had been associated practically with scientific pursuits, and whose memory will be respected by a very large circle. Mr. George Thomas, who died in his eighty-fifth year, was fully in touch with the literature, science, and mechanics of our day; and, though for some time confined by the infirmities of old age, his intellect was bright to the last. He was a man of varied experiences, having been present at the Bristol riots, and it was interesting to listen to his graphic description of the circumstances. His knowledge of the inner workings of the Chartist movement was only equalled by the philanthropy which enabled him to see the fair side of that social revolution. In geology, his *Sermons from Stones* were most interesting to those who were privileged to accompany him in a country walk. In astronomy his enthusiasm was intense. He made his own speculum, and built a telescope of great power. He was one of the pioneers of photography, and during the Crimean War, as a hint to the British Government, he, using the object-glass of a five-foot telescope, photographed the fort at New Brighton from Waterloo, giving a distinctiveness to the object and its surroundings which was as clear as though only a few yards distant. The object of such a discovery is apparent, enabling a reconnoitring party to obtain full knowledge of the enemy's camp. This is now realised more simply by a photo-telescopic lens, but the result is little different. His microscopic eyepiece, most simply constructed, has been of immense advantage to students in that branch of science. In the Spring Exhibition at the Walker Art Gallery were many interesting objects, which were selected from his collection by Mr. J. Alex. Forrest, who undertook the arrangement of the historic section of the photographic exhibits. Among these were the first attempts at photography by Josiah Wedgwood, some groups connected with public functions in Liverpool, and reminiscences of the late Joseph Mayer—a most intimate friend—one of which was a photograph of the laying of the foundation-stone of the William Brown Library, in which were portraits of the late Sir James Picton and other local celebrities. Kindly in disposition and respected by all, his memory will be long cherished.—*Liverpool Mercury.*

EXHIBITION OF PHOTO-MECHANICAL PRINTS AND PRINTING PROCESSES IN NEW YORK.—The Society of Amateur Photographers of New York will hold an Exhibition of photo-mechanical prints and printing processes at the Society Rooms, Nos. 111, 113, and 115, West 38th-street, New York, from November 26 to December 8, 1894. The Exhibition will be open to all the world and prints from plates made by any process in which photography is employed as well as the plates and everything used in the process may be exhibited. The Society will endeavour to make the history of photo-mechanical printing one of the features of the Exhibition and will be glad to show prints or apparatus made or used when photo-mechanical printing was a new thing and prints or apparatus made by or used in processes which are not employed at the present time, and, in fact, everything showing the development and progress of photo-mechanical printing. Another feature of the Exhibition will be the display of plates and prints in their progressive stages. During the Exhibition, demonstrations of photo-mechanical printing will be given and papers on matters connected with the art will be read. A Committee of experts to examine and report upon the exhibits will be appointed. The Report of the Committee will be printed and a copy will be sent to each exhibitor. Prints, &c., intended for the Exhibition coming from abroad, if mailable, should be sent by post. The attention of foreign exhibitors is respectfully called to the facts that photographs and photo-mechanical prints when imported into the United States are subject t a customs duty of 25 per cent. *ad valorem*, and that the foreign express companies make a charge for brokers' fees and delivery in addition to the charge for transporting goods to this country. The Society does not undertake to pay these duties and charges, and will be obliged to decline to receive exhibits unless all duties and charges are paid by the exhibitor. On articles valued at less than two dollars, sent by mail, no duty is exacted. If the number of European exhibitors warrant it, a European agent to collect and forward exhibits will be appointed, and intending exhibitors residing abroad are requested to notify the subscriber of their intention to exhibit as soon as possible, so that they may be informed of the name and address of such agent. At the close of the Exhibition the exhibits will be returned to the exhibitors at their expense. Blanks to accompany prints and any information about the exhibition desired may be obtained by addressing Robert A. B. Dayton, President, &c., 111–115, West 38th-street, New York.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,661.—"Improvements in Portable Optical Lanterns." S. J. LEVI and A. J. JONES.—*Dated August*, 1894.

No. 14,743.—"Improvements in and connected with Shutters, Caps, or Coverings for Lenses of Photographic and other Instruments." H. THIEBEAULD DE LA CROUÉE.—*Dated August*, 1894.

No. 14,765.—"Improvements in Apparatus for Electrically Effecting the Reproduction at a Distance of Graphic Matter or Designs Written, Printed, Stencilled, Photographed, or otherwise Produced." R. GREVILLE-WILLIAMS.—*Dated August*, 1894.

No. 14,889.—"Improvements in Science Lanterns." J. H. BARTON.—*Dated August*, 1894.

No. 14,923.—"Improvements in the Manufacture of Articles Impregnated with Celluloid and the like, Applicable also in the Recovery of Spirit and other Solvents from Celluloid and like Solutions and from Varnishes." A. GRAY.—*Dated August*, 1894.

No. 15,031.—"A Solution for Use in Mounting Photographic Prints." H. WALKER.—*Dated August*, 1894.

No. 15,041.—"Improved Methods of Obtaining Prints or 'Transfers' of Designs, Patterns, or Pictures, and Reproducing such Designs, Patterns, or Pictures upon the Surface of China or the like Articles." SIR H. DOULTON, KNIGHT, and J. SLATER.—*Dated August*, 1894.

No. 15,050.—"Improvements in and Relating to Photographic Camera Dark Slides." W. D. PEPPER.—*Dated August*, 1894.

No. 15,189.—"Improvements in Slide Carriers for Optical Lanterns." W. HUNT.—*Dated August*, 1894.

No. 15,217.—"Improved Means for and Method of Separating Photographic Gelatine Films from their Supports or Bases, and Enlarging the Same." A. J. E. HILL and A. A. BARRATT.—*Dated August*, 1894.

PATENTS COMPLETED.

AN IMPROVED COLLAPSIBLE TRIPOD STAND.

No. 15,811. WILLIAM ALBERT EDWARDS, Weston House, Broadway, Tooting, S.W.—*June* 23, 1894.

I PROVIDE a round, tapering stick of wood, or other suitable material, divided into three equal sections in the direction of its length; each section is cut down about three-fourths of its length, from the top or thickest end, to admit of spreading when tripod is opened. The head of tripod is formed of a centre boss provided with three lugs; these lugs are slotted to receive three strips of metal, which are secured by pivots, on which the strips are free to turn until

they are all in one plane, when they are prevented from further turning by contact with the bottom of slot in lug.

When open, these strips form the head of tripod on which the camera is supported, and is kept tight and secure by the tripod screw (which is drilled for that purpose) in the nut in baseboard of camera. To the extremity of each strip are attached two flat metal hinges, one on each side, by means of a pivot, and forming a flexible joint in one direction, the rivet of the hinge forming the same in the contrary direction, and the two combined forming a universal joint on which a division of a section of stick swings. As before said, each section is divided for the purpose of spreading when opened, and it follows that one division of each section is attached to one strip and the other division to the next strip, so that when the head is opened the divided sections are opened with it, thereby distributing support of camera over a considerable space, and securing rigidity. The top inside of stick is cut away to allow the tripod head and screw to lie in when closed.

For extending the legs of tripod, I make a groove on the inner angle of each section; this groove is greater in depth than in width, so that it allows a tube of elliptical section to run freely up and down when the axes of groove and tube are identical. When it is required to fix the tube, all that is necessary is to give it a slight turn to the right or left, when it is securely held by friction. In some cases I dispense with the collapsible head, and simply secure each of the three sections to a lug on a centre boss, the sliding arrangement being the same as in the foregoing case. I strengthen stick with collars and ferrules, and do not confine myself to the use of wood or metal for either of the said parts. It is evident that this stand is suitable for other purposes than as a photographic camera stand, such as an artist's easel, music stand, &c.

The claims are :—1. A collapsible head for tripod stands, containing a series of universal joints made and constructed substantially as described. 2. A collapsible head in combination with a segmental stick attached to and closing in same substantially in the manner described. 3. A sliding tube or rod of elliptical section in combination with a groove or collar of elliptical section substantially as described.

Improvements in Photographic Cameras.

No. 14,927. Edward Howard Percy Humphreys, 8, Hyde Park-gate, S.W *July* 7, 1894.

My invention has reference to a method by which photographic pictures on continuous films or otherwise can, by the simple mechanism hereinafter described, be taken successively with greater ease and simplicity than heretofore.

For this purpose I use an ordinary hand camera or box with lens and time or instantaneous shutter of any suitable construction. Inside this box or camera I place two rollers or guides, and two wind rollers, over which the film passes, and the two guides or guide rollers are so arranged that their common tangent planes are perpendicular to the axis of the lens. The other two rollers are respectively the wind-up roller and the wind-off roller, that is to say, in taking successive pictures, the film is rolled from the wind-off roller on to the wind-up roller. The circumference of the wind-up roller is equal to the length of film required to take one picture, and, after a picture has been taken, the roller is made to revolve so that it winds up the exposed film and allows new film to come in front of the lens.

The construction above described is that usually employed for cameras of this description, and my invention consists in the combination of mechanism or mechanical device to be now described.

On the axis of the wind-up roller, and capable of turning freely thereon, is a toothed wheel, the teeth of which fit into the teeth of a toothed curve. This latter being fixed or attached to a main shaft running parallel to the wind-up roller. The toothed curve forms an arc of a circle, and contains sufficient teeth to turn the wind-up roller through one revolution.

Also fixed on the main shaft is another toothed wheel, near the circumference of which is a pin, or piece, to which reference will be made hereafter, and which we may call a stop pin. The teeth of this wheel just mentioned fit into the teeth of another wheel on another shaft. This latter shaft being used for winding up or setting the shutter previous to an exposure.

On another part of the main shaft is fixed a small pin, or piece, which we may call a release pin, so placed that at a convenient moment after the film and shutter have been wound up this release pin releases a catch connected with the shutter and allows an exposure to be made.

In order to turn the main shaft, a driving arm, or handle, may be connected with it in any convenient manner, and I preferrably attach it direct to the main shaft.

By means of a movable stop piece, or catch, which can easily be adjusted into position, the wind-up roller is allowed to revolve in the direction to wind up the film, but not in the opposite direction.

By means of another movable stop, or catch, the toothed wheel on the axis of the wind-up roller already referred to is enabled, when revolving in one direction, to make the roller revolve with it so as to wind up the film, but when revolving in the opposite direction it slips round, the wind-up roller being prevented from going with it by the movable stop or catch hereinbefore mentioned.

When the driving arm, or handle, is moved round as far as it will go (the distance it can travel depending on a regulating arm in a manner afterwards to be described herein), it turns the main shaft with it, pulls up a length of film, and winds up the shutter at the same time. The arm, or handle, is then moved back in the opposite direction, and, in so moving, the shutter is released by the release pin above mentioned, and an exposure made. Thus, by means of my invention, a simple to and fro motion of the driving handle pulls up new film, sets the shutter, and gives an exposure.

As the film is wound up for successive pictures, the circumference on which the film is rolled gets larger and larger, and each successive revolution of the roller will pull up more and more film in excess of the amount required for one picture. To obviate this, I adopt the following device :—

Pivoted in a convenient manner, I have an arm of metal or other suitable substance. This I call the regulating arm above mentioned, and is turned or cut at one end. This turned or cut end is so placed that, as the driving handle is turned round to wind up the film, the stop pin already described eventually comes up against this turned or cut end of the regulating arm, and the driving handle is prevented from going any further in that direction.

A small roller is attached to this regulating arm at right angles, and also rests on the circumference of the wind-up roller and parallel with it. By this means, as more and more film is wound on to the wind-up roller, the regulating arm is raised up, and the turned or cut end of the regulating arm is so cut or turned that the larger the circumference on which the film is rolled the shorter is the distance allowed the driving handle to travel. I thus obtain with each movement of the handle a uniform length of film.

I may also, and preferably do, employ the following arrangement of the rollers in my camera :—I place the two wind rollers nearer the lens than the two guides or guide rollers, between which is the piece of film on which the picture is to be taken. The rest of the film I screen from the light coming through the lens during an exposure in any suitable manner.

By the adoption of this arrangement considerable space is saved.

Improvements in the Construction of Supports for Glazed Photographic Pictures and other Articles capable of being similarly Supported.

No. 16,202. Eustace Frith, North Albert-road, Reigate, Surrey. *July* 14, 1894.

This invention has for its object to provide an economical, useful, and simple means of support for glazed photographic pictures and other surfaces ornamental or otherwise requiring to be capable of being at will folded flat or substantially flat against the body to be supported, or alternatively opened out at an angle to afford a support to such body.

The improved construction of back or support is designed to be stamped, cut, or formed from one piece or sheet of material, by preference (as from a sheet of leather board), and said sheet of material may be ornamented either printing, by lithography, or otherwise, or by covering the surface in any convenient manner.

The main features of the construction are a back or stiff sheet or board having a portion secured to the back of the picture or supported body, and another portion, generally a larger portion, is left capable of being turned as on a hinge upon a streak or line of its own material, the stiffness or inflexibity of which has at that part been reduced by suitable "bending" mechanism, or by partially scoring through the material, or in equivalent manner producing a hinge between the two portions.

A tongue or part is also cut out of the hinged or swing part, having a barbed or arrow-shaped head, a neck having parallel sides and recesses, and a hinge across the neck, and thence to the part of the hinge joined to this tongue inclined sides. The parts being cut or formed (as by a stamp) from the hinged sheet, counterpart portions are left in the body of the hinged sheet. By opening the swing back, the barbs of the tongue slide along the neck until they come in contact with the projections formed in the cutting, the tongue folding meanwhile on the hinge where the straight portion or neck joins the inclined part.

For large sizes, I sometimes add a tape, strap, or check, which may be fastened in a slot where the barbed piece ends, and, passing over the back of the tongue, this check is passed through the hinge to the back of the support, and there is secured.

This band also aids the automatic working of the parts as the back is worked to or from the picture.

The form of the parts in detail may be considerably varied in shape or design without departing from the principle of construction.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
20	North Middlesex	*Intensification and Reduction.* W. E. Debenham.
20	Richmond	
20	South London	Photographic Printing Processes.
21	Birmingham Photo. Society	
21	Brixton and Clapham	
21	Hackney	*Development* (*Elementary*). T. H. Smith.
21	Hastings and St. Leonards	
21	North London	
21	Paisley	
21	West London	
22	Leytonstone	
22	Photographic Club	
22	Southport	
23	Glossop Dale	
23	Hull	
23	London and Provincial	
23	Oldham	
24	Cardiff	
24	Croydon Microscopical	
24	Holborn	
24	Maidstone	
25	Hackney	Excursion: Greenwich Park. Leader, R. Beckett.
25	Hull	
25	Leytonstone	Exc.: Rainham. Leader, W. E. Hall.
5	Oldham	Excursion: Oldham Wakes.
25	South London	Exc: Bexley. Leader, A. R. Dresser.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

AUGUST 9.—Mr. A. J. Brown in the chair.

Mr. E. H. BAYSTON said that recently, when developing two quarter-plate hand-camera negatives on Lumière plates, the films frilled and expanded to a size nearly 5 × 4. He placed them on half-plate glasses and printed from them. He showed the prints, which were extremely good. The negatives, to start with, were rather dense, so that there was no loss of density in the enlargement. He also observed that he had got films to adhere better to glass plates, the coating of which had been cleaned off. He supposed that something in the nature of a substratum was left on the plates.

SILVER SULPHIDE.

Mr. P. EVERITT, referring to the Zenotype method of toning, which was alleged to be toning by sulphur, quoted Captain Abney as saying that an inorganic silver sulphide could be relied upon for permanency, whereas the organic body could not.

Mr. W. E. DEBENHAM recalled some of his old experiments, which convinced him that silver sulphide in a print was an evanescent substance.

Mr. A. HADDON could throw no light on the assumed existence of "organic and inorganic" sulphides of silver.

PHOTOGRAPHIC CLUB.

AUGUST 8.—Mr. F. A. Bridge in the chair.

Mr. BEDDING passed round specimen prints by a process which, he said, was probably a resuscitation of the Wothlytype. The paper is coated with a mixture of silver nitrate and uranium nitrate. The image had to be very deeply printed, immersion in the hypo bath and subsequent washing being all that was necessary to finish the print. He had found that too prolonged washing caused great reduction of the image. The tone of the results shown was warm brown.

Mr. TOTTEM asked if this was not a similar paper to that sold by a Liverpool firm?

Mr. BEDDING said that the process was different. He showed platino-bromide and gelatino-chloride prints from negatives he had made in the neighbourhood of Eynesford. Replying to a question as to whether the clouds of the pictures were in the negatives, Mr. Bedding said that they were. He had employed orthochromatic plates with a screen.

Mr. J. NESBIT questioned whether the formula for the phosphate toning bath given at a previous meeting by Mr. Welford was correct? He (Mr. Nesbit) had tried it, and found it so energetic that it was uncontrollable. He had, however, added fourteen ounces of water, making twenty ounces in all, and found it better.

Mr. BEDDING stated that his experience of the ordinary phosphate toning bath made up in the usual proportions—Gold, 1 grain; soda phosphate, 30 grains; water, 10 ounces—was that it was so quick that it was very easy to overtone with it. He questioned the utility of such a large excess of phosphate of soda as had been recommended at a previous meeting.

After other business the meeting adjourned.

Bath Photographic and Selborne Societies.—A joint excursion of these Societies took place on Saturday last, the 11th inst., to Beckington, Warminster, Longleat, and Frome. The first mentioned place was reached at half-past eleven, where the Rector kindly received the party, and conducted them over his church (St. Gregory's). The sacred edifice has of late been thoroughly restored, the most interesting portions being carefully preserved. Owing to the brief time allowed at Beckington, views of the interior could not be taken; some exterior views and old buildings near by were photographed. Warminster was next visited, the Minster proving the chief attraction. It being market day, the main thoroughfare presented a busy appearance, and afforded much amusement by the diversity of the wares and attractions incidental to a market fair. Having lunched, the party proceeded to Longleat, the ancestral home of the Marquis of Bath, distant some four or five miles from Warminster. Entering this very extensive and beautiful park at Shearwater, one of the most magnificent views of lake and heavy foliage is presented to the gaze, along the shores sylvan pathways mingle with the carriage road adjacent. Rhododendrons are here luxuriating in great abundance, and follow the course of the drive for miles. Nearer the house, and overlooking it, a grand view of distant landscape is obtained, known to tourists as Heaven's Gate. From this point also many hundreds of deer may be seen, forming the most picturesque of subjects. Longleat House is of beautiful design; it forms a fine rectangular block of four equal sides, and is said to contain three hundred and sixty-five windows. For twenty years it was the residence of Bishop Ken, after his deposition from the See of Bath and Wells. The building bears the date 1520, and the whole of the buildings and parks are in a splendid state of preservation. Several members of the party were conducted over the house, which contains most valuable collections of paintings, tapestries, and other art treasures of the past. At half-past five a start was made for Frome, where the remainder of the day's programme was carried out. Tea was served at the George Hotel, and at eight o'clock the return journey was commenced, Bath being reached shortly before eleven. Messrs. Gould conveyed the party, and the arrangements for the excursion gave complete satisfaction.

Leytonstone Camera Club.—On Saturday last the Club had an outing to High Beech, under the leadership of Mr. F. W. Wates. This district gives a variety of scenery, the members appearing to largely favour "mud and water" pictures, a number of plates being exposed on the forest pools. On Saturday next the Club will proceed by boat from Old Swan Pier to Greenwich, under the leadership of Mr. A. C. T. Frost. The members will meet at Old Swan Pier at 2.45.

Liverpool Amateur Photographic Association.—A new feature in this year's programme of the Association has been the institution of a week-end excursion at Whitsuntide (to Dovedale), and at the August Bank Holiday season. The centre selected this year by this Society for an outing was Ludlow, and a more interesting neighbourhood, from an historical and photographic point of view, could not have been chosen. The party journeyed on Saturday to Craven Arms, where three hours were spent in photographing that interesting memento of mediæval times, Stokesay Castle. Ludlow was reached after a charming walk through Bromfield and the beautifully timbered Oakley Park. The succeeding days were spent in visiting the many places of interest in the vicinity of Ludlow, including Orleton, Wigmore Castle, the old home of the once famous family of Mortimer; Downlow on the Rock, Haymill, Caynham, &c.; and the party were privileged in being invited to visit and photograph the fine Tudor mansions of Whitton and Orleton Courts and Ludford House. Ludlow Castle and the church of St. Lawrence were not omitted from the programme, a morning being devoted to each, the beautiful mediæval reredos, the equally fine Townsend tomb, and the fifteenth-century wood carving of the church being particularly admired and photographed. Despite the weather, which on two days was not not what could have been desired for photography, over 300 pictures were taken. The party returned to Liverpool on Tuesday evening after having, in the opinion of all who were present, spent the most enjoyable excursion ever organized in connexion with the Association.

FORTHCOMING EXHIBITIONS.

1894.	
August 28	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 11–Oct. 6	Royal Aquarium.
,, 17–21	Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	Royal Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 20–22.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 23–Dec. 1	Stanley Show (Photographic Section).
December.....	South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHERS AND THE ILLUSTRATED PRESS.

To the EDITOR.

SIR,—I notice in your current issue a letter from a correspondent, Alfred Freke, referring to the notice regarding photographers which appears in *The Lady's Pictorial*. It may interest your readers, therefore, to know my reason for inserting the said notice. No one appreciates more than I do the efforts of photographers, and my only point of contention is that, when sitters themselves send their photographs direct to me for the express purpose of publication in *The Lady's Pictorial*, I should not be called upon by the photographers for the payment of a fee, and that any photograph, for the publication of which the photographer demands a fee, should have the word "copyright" plainly printed on the face of it.

I also feel very strongly that photographers should inform any one who accepts a free sitting that they, the photographers, thereby attain the copyright of the photographs, as I find that many ladies remain in ignorance of this fact.—I am, yours, &c.,

A. GIBBONS,

Lady's Pictorial, 172, *Strand, W.C.*, *August* 14, 1894.

THE VERTICAL CAMERA STAND.

To the EDITOR.

SIR,—A few weeks ago, if I understand rightly, a patent was applied for for a vertical camera stand, or, in other words, a stand to hold the camera in a vertical position.

It has been stated that such a contrivance is not *new*, and some historical facts have been given. Here is another historical fact in connexion with the same principle.

When I was an engineering apprentice (over twenty years ago), we made

and sent abroad certain machines, some of the working parts of which wore out, and had to be renewed from time to time; and, to prevent mistakes when ordering these duplicate parts, it was our custom at one time to fix a set of the duplicate parts to a board, with a painted number under each for certain reference when ordering; but these boards of details became an expensive item, and we adopted photography. It was one of my duties to arrange these pieces, such as pins, cotters, small brackets, &c., and a pattern-maker fixed them to the board by screws, pins, or wire, whilst I photographed them in the ordinary way, the board being vertical at the time.

However, one day (over twenty years ago) we were very busy, and the pattern-maker said to me, "I say, Master William, if you could fix your camera over head and photograph these things as they are laid down, it would save me the bother of fixing them." "That's a good idea, Ned," I replied; "come to me in a quarter of an hour in the drawing office, and I will show you what to make for me." The result was a sort of trestle to hold the camera in a vertical position, "looking down," and to span the board with the various pieces simply laid on. Since this time scores of engineers in Lancashire adopt the same method; such firms as Platt Brothers, of Oldham, have a room set apart for this kind of photography, with a vertical or overhead travelling camera stand; indeed, nobody ever thinks of taking the photographs in any other way.

And now for a very simple and inexpensive arrangement on the same principle. In my private workshop at home, a vertical board, seven inches wide by about three feet long, is attached to the end of a table. Vertically with one end of the board, about twelve inches from the floor, a slot about three-eighths wide runs down the centre of the board nearly its entire length. On this vertical board I fix a quarter-plate camera for copying book illustrations for lantern slides, &c. The book or illustration is placed on the floor, and the camera adjusted up or down on the board, and fixed by an ordinary tripod screw through the slot. As I generally do this kind of work in the evening, two paraffin lamps are used, with paper or cardboard reflectors, for illuminating the thing to be copied. The whole arrangement is just as simple as it can be, and thoroughly efficient. In the patented article I understand that a glass table formed part of the invention; but what about the vertical photo-micrographic apparatus?—I am, yours &c., W. I. Chadwick.

Manchester, August 13, 1894.

AN OPERATOR'S GRIEVANCE.

To the Editor.

Sir,—"Light" and "Bond" seem to have dropped in some queer places. They are not the only ones who have done so, but still I think great thanks are due to "Light" for exposing the tricky advertiser who inserts in his advertisement "None but first-class men need apply," for the simple and sole reason, in nine cases out of ten, of getting an operator and retoucher of ability for a few weeks that shall do some nice specimens, he knowing full well the man who responds to his advertisement will not stop longer than a fortnight or three weeks. But operators of ability ought to know better than to answer such an advertisement, knowing themselves a place cannot be a very high-class one that wants a man as described, first-class operator, retoucher, and to make himself useful. Such an advertisement sounds as though you will be expected to do all the work there is, printing included.

My advice is, Never answer such an advertisement; and when an operator engages for a certain time, as is often the case, be careful how you engage. The following may be of use to many. I answered an advertisement, "Operator and retoucher of ability required for one month only," &c. As usual I engaged with the advertiser at so much a week and all expenses paid by employer. I have finished this month, and gave every satisfaction, but, to my surprise, he handed me 30*s.*, fare one way only. When I spoke to him on the subject he got rough, lost his temper, and told me to go and be d——. I explained I should go to the county court for the remainder, *i.e.*, 30*s.* Do what I liked, he said. When I returned home, of course I did as he wished, and am happy to say he paid it without further trouble, with the extra 2*s.* for summons. *Employés* should be sharp, no matter who they are dealing with. Where is our union that was so much spoken of? I am afraid in the waste-box.—I am, yours, &c. Pro Tem. Operator.

August 13, 1894.

"A CALL TO ARMS."

To the Editor.

Sir,—As I had hoped and expected, Messrs. Cadett & Neall's reply to "Rudder Grange's" has met its deserts. I, for one, *most fully* concur with his remarks in this week's issue. Why, I ask, in all common fairness and justice, is the amateur to be nursed to the detriment of the struggling professional? It has been asserted so often in the columns of your Journal, by men who ought to know, that the amateur is a help, and no hindrance, to his less fortunate brother, that a poor tinpot man like myself has naturally abstained from making either complaints or comments; but, feeling the proverbial straw, I must add my conviction to that of "Rudder Grange." The only consolation I can offer him is that, fortunately, the best manufacturers, in my humble opinion, do not stoop to the given-away-with-a-pound-of-tea business, for, until some of the shining lights take the matter up, there is, I fear, little or no hope for the much-despised but *mostly cash-paying*— Itinerant.

Basingstoke, August 4, 1894.

To the Editor.

Sir,—First let me thank Mr. Warburton for his delightful letter; it has, I am sure, given us all a good laugh, and that is something to be truly grateful for. It does not seem though, to me that the amateur looks for the reason of the onslaughts made on him in the right direction. Let him by all means pursue a "harmless, delightful, and scientific pastime," and when he returns from lake, sea, river, &c., to the nearest town, the professional will gladly help him by the loan of a dark room, replenishing his plates, or in any way he can. It is when he comes to us and wants enlargements made, from our negatives, at trade prices, or when he insinuates that we are little better than robbers to charge more than a bare margin above cost price for views or portraits, that we can do without his presence, or more agreeably than with it.

Let me give a recent instance in my own experience of what I mean. An amateur comes into my shop—I sell views—and, because I ask him more for a platinotype print than one on silver paper, is quite abusive; tells me and every one else in the shop that the paper only cost twopence; what a rush it was to ask fifty per cent. more for it than the silver prints, &c. Again, a few days ago a wealthy lady brought her grandchild to be taken. I had taken the child two years before; the portrait was the most successful ever done of him, she said. What is the order now? Half a dozen *c.d.v.'s*; but "we want them very good, as I am going to get it enlarged by a man I know in London!" This to me in my reception-room, surrounded my enlargements she admired. Explanation: the father of the child is an amateur, and wants the enlargements at trade price; frequently desires me to do him an enlargement from my view negatives, but at trade price.

Well, I know that enlargement will never be made. When they go to London, the first pleasure of the portrait will have died away; they will wait until he is taken again, and so on.

That is the sort of thing that we object to—destruction of trade. Be it remembered that this was a wealthy family, who had no reason to begrudge a fair price. Well, these are only two instances, but we know they are not uncommon occurrences.

Now as to the objection to money prizes. What do the prize-givers incite the amateur to do? To work for money—that is, to become professionals. The very fact of a man competing for a money prize disqualifies him as an amateur in other pastimes. Now is the time for true amateurs to show us a friendly feeling by following the rules of such sports as cycling, &c., and disqualify the money-prize seeker from competing for medals, &c., as an amateur. There is a letter by "S. E. K.," which Messrs. Cadett & Neal think worth reprinting, and supplement by the footnote "Sound advice to professionals." It's a curious letter to find any advice in. What does "S. E. K." wish to point out by instancing West & Dore? He says they were amateurs, and have become professionals. Well, who benefits by that? Artistic photography, I presume, and Messrs. Dore & West—certainly not the pre-existing professionals. I presume Messrs. Dore & West would not feel unmixed joy at two other amateurs "shining forth," and eclipsing them. Artistic photography might benefit, but that is an abstract quality, not a man whose first necessity is to get his living. Be it understood that I in no wise begrudge success to these gentlemen, but, if an amateur turns professional and succeeds, I fail to see why his competitors should rejoice. Let us put a few cases in other callings. Perhaps some amateur readers of this are dependent on law or medicine for a livelihood. Do they delight in the amateur lawyer or medico? Suppose these amateurs render the pursuit of medicine or law as easy to any amateur as photography; suppose these same amateurs become professionals, and compete with the older-standing professionals for clients and patients, and "shine forth," would there be great joy in the houses of the older lawyers and doctors? Yet the professional photographer is always having it held before him that the amateur does all this for him.

We can't boycott the amateur, nor do we desire to; but, taken altogether, he is not the unmixed blessing he may think himself to be to us. As for the money prize, it is a direct encouragement to the amateur to seek, in a pursuit he has hitherto enjoyed for pleasure or honour, sordid gain—a gain which is not allowed to the amateur in other pastimes. The tendency of this money-seeking is, if the man wins, to make him look for more; if he loses, to disgust him with his, perhaps, excessive outlay in photographic materials. When all is said, the money prize is just a bid for popularity. Very well. Let those who benefit by the prize support the giver; it is not a professional's interest to do so in this case, quite the reverse.

Messrs. Cadett & Neall again allude to the difficulty of getting professionals to pay, and state that "unlimited capital" is the necessary foundation for trading with them. How does, then, the ordinary dealer manage? Is he just a philanthropist, a man of colossal wealth, or what? He seems to flourish, yet I have never encountered his "army of debt-

collectors." I think too much is tried to be proved. The professional photographer may be a bad payer, but I fancy I have heard of long credit in a good many other businesses. It is curious rather, directly under Messrs. Cadett & Neall's encomium on the enthusiastic amateur, to find a letter on used-up societies.

We are twitted with our inability to combine. There is much to excuse that — natural rivalry, scattered forces, concentration on our immediate necessities. We have never had the opportunity of meeting as young men of our calling in large numbers; still, I am more hopeful on the matter than my brother-member of the National Association of Professional Photographers. Englishmen are slow to move and independent of thought and action; but, I am glad to say, tenacious of purpose.

The number of letters on this subject show that the general body is more alive to its interests than it was. We will try to combine and stick to it if we can. I hope I shall see "Rudder Grange," my fellow-correspondent member of the National Association of Professional Photographers, and many others who think it time to act, at the annual meeting in November next. I don't want to call any one to arms, but I do wish to call all professionals to a sense of their mutual interests, and impress them with the fact that it is worth while to be (as I am)—

August 13, 1894. A MEMBER OF THE N. A. P. P.

COLOUR PHOTOGRAPHY.

To the EDITOR.

SIR,—Professor Joly, in his interesting paper on colour photography reproduced in your JOURNAL of July 20, makes a statement, which, unfortunately, is quite misleading in its application. As proof that there is considerable latitude in the character of the colour screens to be used in composite heliochromy, he gives König's curves for the colour sensations as correct, and Maxwell's as incorrect, and remarks that in spite of the incorrectness of Maxwell's diagram, I obtained excellent results with colour screens made in accordance therewith. The inference is, that I should do even better if my screens were made in accordance with König's diagram. It would be a great mistake to believe this. I have already pointed out, on pages 13 and 14 of the *Hand-books to the Photo-chromoscope*, that inasmuch as the purest green can be produced—the purest green that anybody not totally red-blind ever sees—is the green of the spectrum at Fraunhofer line E, and that therefore the only measurements available for composite heliochromy are those based upon the assumption that that part of the spectrum represents the fundamental green. Maxwell's measurements were made upon that assumption, and the application of his measurements in composite heliochromy makes it possible to secure (in the photo-chromoscope) reproductions of the purest spectrum green with less than five per cent. degradation of purity. With the photo-chromoscope negatives made in accordance with König's diagram, the same green would show a reduction of purity amounting to forty per cent., and with the photographic screens made in accordance with Helmholtz's diagram the degradation would be still greater. In one case we should obtain pure green; in another, bright yellow—green; in the other, pale apple-green. Certainly, the visible errors resulting from the application of König's curves in composite heliochromy, however accurately they may represent the Young-Helmholtz theory as now understood, would be twenty times greater than those resulting from the application of Maxwell's measurements.

Professor Joly also appears to be ignorant of the fact that even such slight errors as result from the application of Maxwell's measurements have been eliminated from the process, which I have for years carried out in accordance with Abney's measurements, also based upon the assumption that the spectrum green at E represents the fundamental, but taking the red below C and the violet above G½H as the other two fundamentals.

I have not, therefore, obtained perfect results in spite of a wrong procedure, but because my procedure was quite right, and the only one consistent with the results of laboratory measurements and mixtures of spectrum colours.

I do not believe that anybody who, like Captain Abney, has matched pigment colours by mixtures of the purest red, green and violet of the spectrum, and found that it takes very definite mixtures to make an acceptable match to the eye, will readily believe that there can be much latitude in the production of screens for composite heliochromy where accuracy of reproduction is desirable, or that such a degradation of the greens as would result from proving the screens by König or Helmholtz's diagrams would be anything less than fatal to the process. In fact, Captain Abney has already said that, reasoning from first principles, what I have said about the colour screens is right, and intimated that any one who would dispute what was supported by such good argument should be made to furnish the proof.

My own conclusion, after making hundreds of photo-chromoscope negatives, with about a dozen different sets of screens, designed to test this matter thoroughly, is, that it is not true that there is much latitude in the adjustment of the colour screens if you wish to deal with any variety of delicate colours. Imperfect screens may give passable reproductions of some subjects, but they are sure to fail with others. A perfect set of screens will reproduce all colours equally well.

It has required a great deal more careful labour than anybody will ever know to realise and practically demonstrate the true principle of colour selection in composite heliochromy, and it should not now be easily discredited by the reckless statements of loose thinkers and careless experimentalists who have never produced good results themselves.—I am, yours, &c., F. E. IVES.

2750, *N., Eleventh Street, Philadelphia, August* 1, 1894.

A MYSTERIOUS NEGATIVE.

To the EDITOR.

SIR,—On Monday, the 6th inst., I exposed two plates in a friend's garden.

Negative No. 1 was as follows:—Edwards' medium isochromatic; *f*·16; exposure, two seconds; developer (ten per cent. solution)—

Water	3 ounces.
Pyro	40 minims.
Bromide ammonium	20 ,,
Ammonia	15 ,,
Added ammonia	100 ,,

Print from this enclosed.

Negative No. 2.—Exactly as above, except exposure three seconds, and added ammonia twenty minims only. This came up as over-exposed; but, the first negative being satisfactory, I let it come. There is also on it a child's dress, a man's hat of an old fashion—note the wide brim—and a dog.

I enclose unfixed silver print of this, together with the negative, which need not be returned.

The plates I bought a month ago from Mr. Richard Keene. They have not been out of my possession, or previously exposed, or even placed in a dark slide.—I am, yours, &c., W. R. BLAND.

Duffield, Derby, August 9, 1894.

[Both negative and print show the supplementary figures exactly as our correspondent describes them. We cannot account for the phenomenon. Have any of our readers had similar experiences?—ED.]

TONING WITHOUT GOLD.

To the EDITOR.

SIR,—You may remember that about six months since I sent you, from Davos Platz, a formula for toning without gold, and at the time I said that "history repeated itself." I had published a formula some thirty years ago. I can now furnish you with the exact date of publication, viz., *Photographic News*, March 21, 1862, p. 143.

I have lately been making many experiments in toning with lead and gold, &c., and I have come to the conclusion that the most permanent prints are those toned after fixing. A little later on I will send you a method of toning, giving a most beautiful bright blue colour. The prints will resist any action with the ferridcyanide and hypo reducer.

I repeat from memory the receipt I sent from Switzerland, *i.e.*, to ten ounces of a ten-per-cent. solution of soda hyposulphite add about four drachms of Beaufoy's acetic acid (ordinary), made a few hours: place print directly out of frame in a solution of plumb acetas, two drachms; aqua, ten ounces, for a few minutes; then slightly wash and put in hypo bath. Bear in mind that the prints dry darker, but they must be printed fairly dark.

I have prints by me that have been finished over thirty years, and they are quite good; in fact, I do not notice any change.—I am, yours, &c.,

British Association, Oxford, August 12, 1894. A. L. HENDERSON.

IMITATION CERAMIC PHOTOGRAPHS.

To the EDITOR.

SIR,—With regard to the letter which appeared in your issue last week, I beg to say that I don't see how your article on imperishable photography can create any false impression. Certainly, you did not refer to any one, far less the Midland Photographic Keramic Company, and I don't see that they can do any good by throwing cold water on a simple and beautiful enamel process.

Let us examine the claims to permanency. In the first place, if we take ordinary enamelled ware from any of the potteries of England, we find that they chip and crack. Take japanned ware from any good house, and we find that it stands the test of time and the wear and tear of every-day service wonderfully well.

Therefore I have equally as much right to say that a good hard varnish, heated to 200°, is as durable as any other enamel or glaze for pictures or photographs. No one would dream of using a sharp point to scratch a highly finished picture, and surely no one but a madman would think of using a sharp chisel, except on a block of granite, an engine shaft, or the castings of a high-level bridge.

For experiment, I have often exposed pictures to damp; but, in the ordinary course of business, no one would expose to prolonged damp a delicate-finished picture, although a simple medium, let alone a good

varnish, has stood the test for hundreds of years. As for spirits, if they mean whisky or brandy, the chances are that they would affect the individual sooner than the picture.

Hang the picture on the wall. Gentlemen, this is an imperishable, japanotype enamel, a simple and beautiful process, within the reach of all.—I am, yours, &c., HENRY HOLMAN.

Banff, N.B.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange a lot of lantern slides (some 200) for a good half or quarter-plate camera.—Address, W. MAVERS, 5, Winny Park-place, Elba-lane, Parkhead, Glasgow.

Will exchange first-class mahogany-bodied single lantern, jet, and tubing, nearly new, for studio stand and camera or good cabinet lens.—Address, HERBERT GREEN, Illingworth-yard, Bingley.

Will exchange seven volumes (six bound) *Strand Magazine* and *Review of Reviews* to date, condition perfect, for a half-plate rectilinear by Perken, Son, & Rayment.—Address, PIKE, 3, Hinckley-road, Leicester.

Excellent fishing-rod (the Chevalier), never been used, in bag complete; wanted, in exchange, good half-plate rapid rectilinear lens or whole-plate camera.—Address, H. STEEL, 74, Goldstone-road, Hove, Brighton.

Exchange Voigtlander's cabinet portrait lens, three and a quarter inches diameter, condition as new, for high-class hand camera.—Address, H. W. BUSBRIDGE, Photographer, Vanburgh-place, Blackheath.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

John Browning, Exeter.—*Two Portraits of the Bishop of Exeter and one of the late Rev. Toye.*

Alfred Rogers, Stretford, near Manchester.—*View of the fourth side of Ashton-on-Mersey old Church, Chester.*

Debenham & Co., York.—*Portrait of the Lord Mayor of York.*

George Watmough Webster, Chester.—*Portrait of Lady Margaret Grosvenor.*

OUR Editorial Table next week.

RECEIVED.—Conrad Beck; A. Seaman; Curtis Brothers; W. Laurence, and others.

T. H. B.—So long as the first etching solution tastes slightly acid, it will be strong enough when the work has to be very delicate.

T. E. L. E.—Negative lenses, double concave, of various foci, may be obtained of any working optician who makes spectacles a specialty. They are very inexpensive. The very deep curves are charged more for than the shallow ones.

H. J.—Had you read the articles that have recently appeared on the subject, you would have seen that you have no *valid* reason for complaint of the amount remitted for the residues. We cannot say any more than you can whether the return is fair or not.

J. B. C.—Any good surface paper and most of the "enamelled" papers as used by lithographers will answer quite well for collotype work. The sizing of the latter, however, should be what is termed fairly hard. If it is very soft, it does not answer so well as the harder kinds.

P. PHILLIPS.—Much, if not all, the trouble you anticipate in the drying will be avoided by employing the new daylight tissue. There is no best colour to use. It is quite a matter of taste as to what colour pictures are the best. There are many coloured tissues to choose from, all of which are good.

COPYRIGHT.—Theoretically each separate photograph would require to be registered; but, as you say your negatives are identical, the registration of one print will virtually suffice to protect the others. 2. A strong solution of hypo has been recommended for removing the yellow stain caused by reduction with ferridcyanide and hypo.

C. C. WRIGHT.—We do not remember any such article as that to which you refer. Cyanine is blue. If you obtain the cyanine supplied by Hopkin & Williams, and similar houses, you will have the kind usually employed for sensitising for the red rays. As the articles referred to are not within our memory, and no reference is made as to when they appeared, we are unable to offer any further information.

GRAVURE.—The trouble is, no doubt, due to the first etching solution being too weak. It should not attack the highest lights within a couple of minutes.

YORKS.—There is no novelty in the matter. Plates that are orthochromatised with eosine are proportionately more sensitive to artificial light—such as candles or gas—than they are to white light. Therefore an advantage will accrue from their use in photographing the cellar, which is illuminated solely by gaslight. The only way to get a correct idea of the exposure required is to expose a trial plate.

PHOTO (North Bow).—The mountant usually employed for cementing silver prints in optical contact with glass (opalines) is a thin solution of gelatine, and nothing is better, provided the gelatine is good and free from impurities that would act deleteriously on the photograph. Starch is sometimes used, and that is also good. All communications requiring reply in this column should be addressed to the editor, or delay is incurred.

T. WILKS.—The opaque spots on the negatives are due to the plates, or, rather, the emulsion with which they are coated. The only thing that can be done is to touch out the slight spots they produce in the prints as suggested. We agree that this is a tedious, troublesome work, and that it is very annoying that it is necessary, but there is no other way out of the difficulty. We do not expect you will get any allowance made for the used plates

R. BOYALE.—Liquor ferri perchloridi (B. P.) is a solution of perchloride of iron of a definite strength, as given in the *British Pharmacopœia*. There are two solutions, but this is the weakest. The best way will be to get the strong solution, and dilute it yourself. It is best to use the solution very weak, or it may act too quickly. One or two experiments with old negatives will teach a great deal. Why not use the ferridcyanide reducer; it is more under control.

M. CASPINI (Venice).—It is more than doubtful if soaking the pictures off the mounts and rewashing them will arrest the fading, even in a slight degree. We have known instances where this treatment has been adopted, and the fading, instead of being retarded, has been accelerated. In some cases the image has almost entirely disappeared in the washing water. The only thing we can suggest is to thoroughly dry the pictures and keep as dry as possible. Dryness retards fading, while moisture hastens it.

A. B.—For washing in backgrounds ordinary sable or camel's-hair brushes are employed. No preparation is necessary. The stippling is done on bromide pictures in the same way as on any other kind of picture. We should advise you to get some elementary work on water-colour painting, or, better still, a few practical lessons from a photographic colourist, as you appear to be quite ignorant of the subject. Space will not permit us, in this column, to give such details as would be of any real value to an entire novice.

J. YOUNG.—We cannot say how near to French fortifications it is safe to photograph. Certainly not within sight of them, or within a considerable distance of them, even if they do not come within the view. With regard to photographing the interiors of churches, picture galleries, and public buildings in France, permission will have to be obtained from the authorities in whose charge they are. The proper persons to apply to can readily be ascertained by personal inquiry at the building it is desired to take photographs in.

F. K. B. writes: "I am a block-maker in a small way. Suppose any of the photographs sent to me for reproduction are copyright, could damages be claimed from me in the event of proceedings, or would the customer who gave me the order be liable? Of course I should not reproduce photographs I knew to be copyright; the above refers to those of about which I know nothing."—Our correspondent would be liable as well as all who had to do with the piracy of any copyright work. To protect himself, he should have an agreement for indemnity from those who place the work in his hands if any doubt as to copyright exists.

ANXIOUS TO LEARN writes as follows: "1. Would you be so kind as to let me know how to make oil colour dry dead? It is called flatted oil. The way I mix the colour it either dries too quickly and comes off when rubbed, or it dries with a gloss, so making it quite useless for the purpose of painting backgrounds. 2. I should be greatly obliged if you would also let me have your candid opinion about the prints which I enclose; where I could improve them, &c. Should be glad for any hint by which I could better my work."—In reply: 1. In the one case there is too little oil in the colour, and in the other there is too much. A good way to make a flatting colour for photographic backgrounds is to mix the colours with turpentine to about the consistence of thin paint, and then add about one-third its bulk of gold size. Such colour will dry with a dead surface, and will not rub off. 2. The work is fairly good. The best way to improve is to study the work of our leading portrait photographers and portrait painters.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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THE ROYAL PHOTOGRAPHIC SOCIETY.

We were enabled to announce, a fortnight ago, that Her Majesty the Queen had commanded that in future the Photographic Society of Great Britain should be called "The Royal Photographic Society of Great Britain." The Society, and the entire world of English photography, are to be congratulated on this signal mark of Royal favour. Its value to photography cannot be overrated, for the Queen's action practically amounts, in our interpretation of it, to a State recognition of the fact that photography is entitled to rank with the older arts and sciences in intrinsic importance and general esteem.

The number of bodies representative of some branch of art or science that are entitled to use the prefix "Royal" is small—smaller, in fact, than might be generally supposed. Roughly speaking, there are only between twenty and thirty, the distinction apparently being reserved for those Societies which have proved their claim to officially represent and foster the particular art, science, or profession of which its members are the exponents. This means that, in future, the Photographic Society will have a place on the same plane as that occupied by the Royal Society, the Academy, the Geographical, the Astronomical, the Institute of Architects, the Water-colour Society, the Microscopical Society, and others. The Photographic Society, and, through it, photography has received the hall-mark of State-accorded dignity, which no contemporary artist or man of science can grudge it.

The reigning House has always given a highly appreciated and valued degree of direct encouragement to photography, and this last act of the Queen emphasises and confirms the deep interest which Her Majesty takes in photographic progress. We shall look for the Royal Photographic Society to enter upon a new and possibly more extended field of usefulness under the exalted circumstances in which it has been placed, and have no doubt that it will secure a considerable accession of new members anxious to participate in the advantages of lot and part in the State-recognised representative Photographic Society.

But, above all, we hope, as we believe, that some benefit may accrue to the large army of professional photographers by this elevation of the Photographic Society. How often has the cry, in our pages, gone up for something which will improve the status of professional photography! Well, the thing has been done by the Queen with a single stroke of the Royal pen. Professional photographers have now the satisfaction of knowing that the fountain of honour has given their art and profession the highest recognition in her power. This, if we mistake not, will improve the "status" of photography in the public eye. But it will do more; it will effect the same thing for photographers themselves. The best thing these latter can do now is to become, *en masse*, members of the Royal Photographic Society, and help make that body, what it is evidently thought to be in Royal eyes, the representative Society of photographers and photography throughout the kingdom. With a Royal Society at their back, photographers should no longer despair of having the means and the opportunity of improving their status and themselves.

DUPLICATING NEGATIVES IN REVERSE POSITION.

Desirous of reproducing a negative in reversed position for an experimental purpose connected with the preparation of a photo-mechanical printing surface, we resolved to do it by means of a dusting-on process originally suggested for this purpose by Messrs. Geymet & Alker, of Paris.

As the reproduced negative has turned out to possess certain qualities not at first sight apparent in the original one from which it was obtained, it may prove useful to many if we describe as closely as possible the means employed, especially as we have reason to think that this system may not be known to some of the large army of modern workers whose knowledge is in some measure confined to what is taught in the manuals of the present period.

The discovery of Poitevin that a coating of a colloidal substance, with bichromate of potash and substances having an affinity for moisture, has imparted to it a discriminative absorption of water according to the action of light upon the bichromate is probably known to nearly every one who takes the slightest interest in photography as a science; but there are applications of this discovery with which he may not be conversant, and it is to one of these we are now directing attention. As we have hinted, it is to other Frenchmen we owe the suggestion.

We have for several years given in the Almanac one or more formulæ for the compounding of deliquescent varnishes that fulfil the conditions mentioned above, and we here give another, differing in no material sense from those referred to, but only in proportions, and we give it, not as being better than the others, but as the one we last made use of with a delightful degree of success.

A plate of glass, selected for its flatness and freedom from

defects, is made scrupulously clean, and, having been made slightly warm, is coated with a mixture as follows:—

Glucose	¾	drachm.
Gum arabic	1	„
Glycerine	12	drops.
Bichromate of potash	30	grains.
Water	2	ounces.

This is made warm and then filtered. The coating of the plate with it is facilitated by using a glass rod or a square-edged piece of hard, glazed writing paper. It is then dried before a clear fire, on a shelf in the kitchen oven, or by holding it over a gas stove or atmospheric burner. It is better that the coating be thin rather than thick.

The next thing is to expose it in the printing frame. This must be done while the coated plate is quite dry, and the exposure should be regulated by an actinometer, for one cannot, when using an ordinary printing frame, ascertain the progress of the exposure. But one will soon acquire such a degree of experience as will prevent him going far wrong in future, much in the same way as one does when printing lantern transparencies. Ten minutes in a bright cloudy day will usually suffice for a negative of average density; a bright sun materially shortens the exposure. After exposure, the printing frame is opened in a dimly lighted and damp room.

This is the *rationale* of what has taken place so far. The action of the light has decomposed the potassium bichromate, and converted more or less of it into the oxide of chromium, which, in turn, has rendered insoluble the organic matter in contact with it. This would speedily be shown to be the case if a little water were poured upon the surface, which, of course, must not be done, for, in the course of a few minutes, the parts not hardened by the action of light will absorb moisture from the damp atmosphere of the developing room. But this is on the assumption that there is a considerable amount of moisture in the atmosphere, which is not always the case. How we obviated this will be apparent as we proceed.

To develop the negative, a very soft, fluffy camel's-hair brush is necessary. This is charged with finely powdered plumbago, the very finest possible to be obtained, and it is whisked over the plate by the brush with a circular motion, and avoiding heavy pressure. In proportion as certain parts of the plate—those which have been shielded from the light—absorb the moisture, and thus become slightly tacky, so does the powdered graphite adhere, and thus slowly build up the image.

If the image is too slow in coming up, as, indeed, was the case in one of our experiments, it indicates one, or perhaps both, of two things. The exposure has been too long, or the atmosphere in the developing room is too dry. In either case this was remedied, not by breathing on the surface, which engenders inequality of damp or moisture, but by suspending in the room a large sheet previously immersed in water, and hung up while dripping wet. This soon established such a hygrometric condition on the coating of the plate as to enable it to attract and retain the graphite. We are of opinion that this method of creating the requisite condition of regulated moisture in the developing room will be found an improvement upon the damp cellar so often recommended in connexion with the practice of dusting-on processes, for whatever purposes they are being employed.

After the negative has been satisfactorily developed, it is necessary that it be decolourised by having the bichromate removed. The method adopted by the French experimentalists for effecting this cannot be much improved upon. Coat the negative with a thin collodion, and then place it in water strongly acidulated with hydrochloric acid, by which the yellowness will disappear. After a final rinse the negative is varnished in the usual way.

By the system described, and even with a wide departure from any of the sensitising agents that have been formulated, duplicated reversed negatives may be made with a reasonable degree of certainty.

MODERN RATIONAL DEVELOPMENT.

When the first suggestion of "one-solution" developers was made some few years ago, it was met with sarcastic allusion to the near approach of "automatic development," and "development by machinery;" and certainly, as contrasted with the previous routine with three separate solutions, the innovation did appear to old hands a strange one.

But after careful trial, reaching over a number of years now, the plan of development with a stock solution in which all the constituents of the finished developer are combined in proper proportions in concentrated form, has not only proved to be perfectly feasible, but, if worked with judgment, has all the power, and nearly as great a range of utility for ordinary purposes as the older method of "rational" development with separate solutions. We say specially "for ordinary purposes" referring to the single solution itself, but if it be supplemented by extra solutions for occasional use in accelerating or retarding, as the case may require, the system is in every way as efficient as any other, with less trouble in use.

But the misfortune is that a very large section of photographic workers of the modern class fail to see the necessity for applying judgment to the use of developers or anything else. The "one-solution" developer is sold, like a camera or a lens, to do a certain thing, and the modern "amateur" expects it to do its duty without further exertion on his part. Many—very many indeed—who know nothing of anything but single solutions are utterly ignorant of even the most elementary principles of development, and are, consequently, upset entirely by the slightest variations or inaccuracies in exposure. We fear it will be of little use writing for that class, but we may at least put in a word for the more intelligent workers on behalf of the single-solution system.

It is undoubtedly the introduction of the newer developers that has rendered the "one-solution" a feasible, practical, and useful developer, although ten years or more ago with pyrogallol it was not by any means an impossibility. We have in fact, as far back as that, done very good work systematically with a single stock solution, but the difficulties of keeping as well as using pyro in this manner were much against it. Its rapid discolouration, even in the presence of sodium sulphite, robbed it of one of the chief attractions of the modern single-solution developer—the capability of repeated use—and, when ammonia was used, undoubtedly the best alkali for employment with pyro, the rapid loss of energy still further tended to render the developer unreliable for more than a single application.

Nowadays, however, given tolerably accurate exposures, the one-solution developer may be used with perfect safety for all ordinary work, and with plates of very different characters, with no further variation in its use than in the degree of dilution. For any one class of work—we will say, for instance, portraits in the studio, and adhering to the same kind of plate—there is no necessity to vary the developer in any way

eyond strengthening it from the stock solution occasionally s its energy appears to flag; and even after use the solution ıay be left for days, and will still retain its original developing ower but little impaired.

As a matter of course the particular formula must be ranged to suit the character of the plate in use, but, when ıat has been satisfactorily done, no further change need be ıade except for errors of exposure. It might be naturally xpected that each successive development, in consequence of ıe additional bromine added to the solution from the reduced lver in the film, would have a modifying effect on the eveloper's action; but, in practice, this does not appear to be he case beyond perhaps to a very slight extent increasing the me of development. In fact, we have frequently used a olution that has been left standing exposed in the developing lass for twenty-four hours or more without noticing any ifference in its behaviour as compared with a fresh one.

It is difficult to say which of the newer developers lends self best to the single-solution system; but perhaps the choice es between metol and hydroquinone, each of which possesses ts own peculiar characteristics, and each will therefore probably have its supporters. For portraiture we ourselves incline to metol, but for general purposes prefer a mixture of he two substances named, the mixture displaying all the good ualities of both without in any appreciable degree the failings f either. Thus we combine the rapidity of action of the ıetol and its power of rendering fine detail in badly lighted ubjects with the density-giving power of the hydroquinone, he respective shortcomings of both being lost. The particular ormula we use is as follows:—

Metol	60 grains.
Hydroquinone	30 „
Sulphite of soda	1 ounce.
Carbonate of soda	1 „
Water	15 ounces.

This forms the stock solution, and for use is diluted with rom one to three volumes of water, according to the degree f density desired, the more concentrated the solution the greater the vigour of the image. To secure contrast, as distinguished from mere density, the solution should be used nore dilute, and its action prolonged, while softness is promoted by the use of stronger solution. The solution may be ısed as given above, but we prefer, for ordinary purposes, to ıdd a fair dose of bromide of potassium—not less than one grain to each ounce of stock solution; or this may be kept as ı separate solution if the mixture is to be used chiefly for very short exposures, in which case the developer ceases to be a "one-solution;" but, with the quantity of bromide given, exposures of a fraction of a second in the studio are quite possible, a slightly longer development being all that is necessary.

With this formula we have never found the necessity for any accelerating solution in the form of additional alkali. In cases of under-exposure, continued development with a weakened solution will do all that can be done, while under reverse conditions a few drops of bromide solution, or an admixture of used developer, will answer. In fact, if carefully and judiciously used, we possess as much power with this single solution as with the old "ten per cent. solution."

What we desire more especially to impress upon our amateur readers is the fact that single-solution developers must not be looked upon as automatic, but should be used rationally, and they will then serve every desirable purpose.

Ammonia.—A very useful and instructive paper on *Ammonia*' by Messrs. F. B. Grundy and A. Haddon, was read at the last meeting of the London and Provincial Photographic Association (see page 533). To this we shall probably refer at greater length next week, but in the mean while we may point out that the value of the paper lies in the proved fact that commercial ammonia (*liquor ammoniæ fortissimo*), which is generally supposed to be an aqueous solution of the gas of a sp. gr. ·880, is apparently unobtainable of that strength. The samples analysed show considerable variations in the theoretical strength, so that all developing formulæ which recommend or imply the use of ammonia ·880 are necessarily fallacious. Not the least valuable and practical part of the paper is that which describes the simple method of assuring, by taking the specific gravity of the solution, the use of a (photographic) ten per cent. solution of ammonia—a method which enables the user of ammonia to rectify, as it were, not only the variations in strength of the strong solution as it is obtained from the dealers, but also the certain decrease of its strength by the constant unstoppering of bottles, &c., which ammonia as a volatile compound undergoes. But not only to ammonia-users would the method be of service; it deserves to be availed of by ammonia-sellers, who could thereby retail the solution of an ascertained and definite strength.

The Wellman Expedition.—Additional details of this enterprise, and its failure, are coming to hand. Although some of the accounts state that a good deal, from a scientific point of view, has been accomplished, so far as we have seen, no mention is made of what was done, or attempted, photographically. Photography was to have been a feature with this expedition. It is to be hoped, notwithstanding misfortunes, that some photographic results will be forthcoming.

Photographing Prisoners.—The official prison photographer must have had a busy time of it at Berlin last week. A recent telegram says that the authorities have made wholesale arrests of Anarchists, male and female. It is said that between forty and fifty were taken into custody, the whole of whom were photographed at the central police station, where they were also anthropometrically measured. These photographs and data, if circulated, may be of service in other countries as well as in Germany.

Strong Electricity.—We may always trust our transatlantic cousins to make the best of their opportunities, and the latest example of this trust is sufficiently remarkable to be worthy of note in these columns. The electric tramways give off a strong current, and we are told that in Brooklyn there is sufficient to be utilised to a large extent, with the result that, by attaching terminals to the ironwork of the railways and to the water pipes, sufficient current is tapped to supply motors and light electric lamps. We, however, attach no credence to the rumour that an enterprising photographer there runs an electric studio from this picking up of unconsidered trifles in the shape of electric current.

A New Invention (?)—The specification of a patent has just been published for a method of producing photographic pictures. It is this: The figure or figures are posed before a plain background, preferably white. A negative is then taken. Next the background and any accessories or appliances that may have been employed in arranging the figure are stopped out in the negative. Afterwards an enlargement is made from it, which, of course, shows only the figure on a white background. A background is then drawn or sketched, and then the picture is copied to the size desired, and from this negative the prints are made. Many of our readers will, no doubt, wonder wherein consists the novelty; so do we.

Ammonia as a Detergent.—The pursuit of photography is notorious for the production of stains; but, in addition to the visible

results of chemical operations on the hands, there also remains the hitherto little-noted production of exceedingly dirty fingers, in the ordinary sense of the term, necessarily brought about by handling apparatus, negatives, and so forth, which it is not possible to keep in a state of uniform cleanliness. To those of our readers who have not experienced its value we recommend a trial of the addition of two or three drops—not more—of ordinary strong ammonia solution to a hand bowl of water, used with soap in the ordinary way. The blacks will come away, and a pleasant state of cleanliness be brought about in half the usual time.

Competitions.—Some correspondents who have lately been espousing the cause of professional photographers seem to be greatly incensed at Messrs. Cadett & Neall offering prizes exclusively for amateurs' work. Possibly, however, their feelings will be, to some extent at least, appeased by the announcement that the same firm are now offering money prizes, to four times the amount, to be competed for exclusively by professionals. We know, just now, many professionals to whom the first prize of 100*l.*, or even the second, of half that amount, would be exceedingly acceptable. Another competition announced, with money prizes, is in connexion with orthochromatic photography, and ought to prove both interesting and useful as regards the true rendering of colours, in monochrome, by colour-sensitive plates. What may we expect the next competition to be for?

Photography and Mountaineering.—On Thursday last, at the Grindelwald Conference, Mr. Edward Whymper gave the first of a series of lectures on mountaineering, illustrated by the lantern. A telegram says that the pictures thrown upon the screen excited the admiration of all present; that we are certain of, or they would not have been shown. Additional interest was lent to the lecture by the presence of a number of veteran guides of the district. Mr. Whymper was one of the first, if not the first of mountain climbers who accomplished anything of note that included a photographic camera amongst his mountaineering paraphernalia. This we know he did twenty and more years ago. Many of the illustrations to his work on the *Ascent of the Matterhorn* were drawn from his photographs. Those who heard Mr. Whymper lecture on mountain climbing at the Camera Club a little while ago will realise the pleasure experienced at the Grindelwald meeting.

Rolling Presses.—The increased use of the burnisher has very largely reduced the demand for rolling presses for prints; but still there is considerable use for them. The great drawback to their employment is the great liability of the expensive polished steel plate becoming rusty, when, of course, repolishing is required. Whenever this risk is feared, we strongly recommend our readers to have their plates nickel-coated, which can be done for a very small sum, comparatively speaking. The brilliancy of the surface will then remain unimpaired for years, a gentle polishing with a chamois leather at occasional times will be all that is needed in the way of care. Then, if by accident the surface is injured, the nickel can easily be renovated without incurring the great expense needed in repolishing a burnished steel surface. Lately there has been produced by the electric furnace a combination of silicon and chromium of such hardness as to be able to scratch ruby. If its cost, which we can learn nothing of at present, were not too great, it would be perfect as a material either for burnishers or plane metal plates for the ordinary rolling press.

"Process Blocks" *versus* Collotype.—Process blocks, it seems, are just now running collotype very closely, for the higher class of photo-mechanical work, in some places on the Continent. The same, we understand, is very much the case in this country. As regards cost of production, where large numbers are required, the former decidedly has the advantage. This is not the case, however, when only a small issue is necessary. With regard to excellence of results, process work has been steadily improving for the last few years. That, we regret to say, is not so with collotype. It has rather retrograded than advanced, notwithstanding the more extended employment of machines, which permit of better and more uniform results being obtained than with hand presses. It is quite possible that the race after cheapness has had something to do with this. They are now done at a very low price, and it must be admitted that there are more bad collotypes to be met with now than at any previous time. A good process print is far better than a bad collotype. But a really good collotype is unsurpassed for delicacy and fineness of detail by the best of process blocks. Those collotypers, both at home and abroad, are wise in their generation who have added process work to their other business, for there seems little question that for many purposes half-tone blocks are rapidly taking the place of collotype, even for the better class of illustration.

Art Exhibitions.—The Governors of the People's Palace, Mile End, propose holding a Loan Exhibition, similar to that recently held at the Guildhall, and are inviting owners of suitable pictures to assist them in the undertaking. The Exhibition is to be held during the month of November. Art, as previous exhibitions have proved, is highly appreciated by the denizens of the East End. The great success of the late Exhibition, held in the City, is shown by the report of the Guildhall Library Committee, which we printed last week. In it there is one item that deserves comment, namely the large sum realised by the sale of the catalogue—close upon 1000*l.* This large sale was greatly due to its interesting character, and we know some who did not see the Exhibition that obtained a catalogue. Not only does the book contain a description of the pictures, but it also, where the artist is dead, contains a short biography of him. Every one is familiar, for example with the name of Vandyke, but how few of the general public know that he was born at Antwerp and that he died in London more than two centuries and a half ago. How many are aware that "Old Chrome" began life as an errand boy, and was afterwards apprenticed to a house and sign-painter; or that Gainsborough was buried in Kew Churchyard more than 100 years ago? These biographies are interesting reading, and greatly enhanced the sale of the work. It is to be hoped that the example will be followed if a catalogue is printed of the forthcoming Exhibition at the East End.

DUBLIN CONVENTION NOTES.—V.

(*By our Special Correspondent.*)

It is not easy to perceive why so many tourists spend their holidays on the Continent when they have in Ireland what is, in a large measure, a *terra incognita* of an exceedingly picturesque nature. We all know, of course, that many tourists do visit the sister island, but not in the proportion that one would expect from its intrinsic merits. How many, or rather, how few, of the visitors to the Convention knew much of the beauty-spots with which Ireland teems, previous to July last? And how few of them, if any, left that country without having been delighted with it, and without having expressed a strong desire and intention to see more of it on the earliest possible occasion? Surely it is preferable to spend a week or a fortnight there than among Sicilian brigands, and other questionable characters elsewhere on the Continent!

One cannot say he has seen Irish scenery who has not visited, *inter alia*, the south end of the island. I have Cork, and its surroundings for many miles, in my mind just at present. There is an old distich to the effect—

> "Limerick *was*, Dublin *is*, but Cork *will be*
> The proudest city of all the three."

So the others must look to their laurels. But, doggerel apart, Cork is certainly a fair city on which to gaze. To see it aright, one must ascend the eminences close by. Should there be a shadow of doubt respecting the position Cork occupies among kindred cities, there cannot possibly be any as regards its harbour.

Immediately below the city the river Lee widens out, forming an land bay with islands, promontories, peninsulas, its course for ships, which there are many passing up and down, along with yachts, ɔam and other launches, pleasure boats and fishing boats, its banks : miles studded with lovely residences, from the humble cottage to e impos'ng villa, till one is involuntarily constrained to cry out ith FitzEustace "Where's the coward would not dare to fight for ch a land?" A run of thirty to sixty minutes by rail and boat down e Lee brings us to Queenstown, near to which town the American ips land their mails, and this too, seen as I saw it on a calm, nny, Sunday early evening, is a charming little town, nearly mmed in by islands and promontories, Spike Island being just oppo-e. A photographer, bent on filling his portfolio with rich and ried scenery, might very well spend several days on the lower aches of the Lee and the tributaries of Cork harbour, which opens t below Queenstown to a moderately wide expanse, without being id open to the ocean. When surfeited with camera work, he uld well fill up all his spare time by hiring a boat and going out to e fishing, for, if I am correctly informed, the fish are very undant in these waters.

The city of Cork contains numerous fine buildings and many storic places and monuments. One of the first places that I visited as St. Anne, Shandon Church, and it is probable I was senti-entally influenced by Father Prout's national anthem of—

"The Bells of Shandon,
That sound so grand on
The pleasant waters of the river Lee,"

e tune of which (the "Last Rose of Summer") is probably the st known of any Irish melody. There is an energetic Camera ıb in Cork, and, from what I experienced in Dublin from one of leading members, I don't think I am saying too much in stating t any visitor from this country, calling at the Club, will experience varm welcome.

No one visits Cork without driving out to the famous Blarney stle, distant from the city between four and five miles. It may reached by rail, but the road along the banks of the Lee is so od, and the scenery so fine, that most tourists prefer going by car. ere is not now much left of the Castle except the square tower, t there is still enough to show that it must at one time have been lace of great strength—said, indeed, to have been the strongest tle in Munster. It was the seat of the MacCarthys, the Earls of ancarty. Having been built in the fifteenth century, before the vention of gunpowder, it was for long impregnable. The groves Blarney are, indeed, as charming as the poet tells us they are.

There are many fine subjects for the camera in the city, and veral plates might be worthily exposed upon such erections as e monument to Father Matthew, the great temperance apostle, whose philanthropic labours the Cork people are so justly proud. me of the edifices—Shandon Church, for example, of which I have eady spoken—can only be taken from a point close to it, necessi-ing the employment of a lens embracing a very wide angle, and nce giving a picture in which the perspective is violent. There ıy possibly be better points of sight than that which, on a hurried it, I had to select. A swing back is indispensable, owing to the mera having so frequently to be pointed upwards.

AMMONIA.

[London and Provincial Photographic Association.]

f all the different materials used by photographers in their every-y work, not one is as variable as ammonia, and this is not astonish-g when we consider for a moment what it is and how it is made. quor ammoniæ, as you are all well aware, is a solution of a gas—a combination of hydrogen and nitrogen, NH_3—in water. Water absorbs with great ease a very large volume of ammonia gas. One volume of water at 0°C., and at a pressure of 760 mm., will absorb 1148 volumes of ammonia gas; but, when this same liquor ammoniæ is exposed to the air, it as easily gives off the gas, and that which is left behind becomes poorer and poorer in active material. Water saturated with ammonia at 0°C. absorbs the above number of volumes of gas, but with a rise of temperature the water absorbs less gas, and, if the temperature of a vessel containing the strongest ammonia be raised, the gas exerts pressure on the surface of the liquid in order that the excess above 0°C. may be retained. If, under these circumstances, the stopper be removed and the pressure reduced to atmospheric, the excess of gas will be given off. This evolution of gas is at times attended with danger, as, if the temperature be 20°C. or 25°C., the gas in escaping may cause the liquid to boil, and some considerable portion to be ejected from the bottle, so that the opening of a bottle of ammonia in summer ought to be done in the open and with considerable care.

Ammonia of sp. gr. ·880, as far as we are aware at present, only exists (commercially) on the labels of the bottles. According to Carius, at a temperature of 64° F., water absorbs so much ammonia as to produce a liquid of sp. gr. ·884, so that ammonia of commerce, in summer at least, is not and cannot be as the label indicates.

We need not go into the manufacture of ammonia or its different sources; that is beyond the scope of this short paper. What we wish to point out is the variability of this material, and hence most probably the disrepute into which it has fallen, though it must be admitted that the majority of professionals still prefer it, and the best work, we venture to think, is still done with it in conjunction with pyro and bromide.

Most of the new developers produce negatives which resemble those developed by means of ferrous oxalate, more or less blue by transmitted light, dense to the eye, but feeble in their power to stop the actinic rays when used for printing purposes. The yellow stain produced by pyro-ammonia is equivalent to an extra thickness of silver, and to a certain extent deceptive in the opposite direction. Control of development can be better obtained by the use of ammonia as the accelerator than when the carbonates of the fixed alkalies are used. The carbonates of the fixed alkalies can be obtained pure and of fixed quality, and therefore solutions of definite and constant strength obtained; but up to the present the same cannot be said of ammonia, as it has only been used in a hap-hazard way. If the ammonia is of sp. gr. ·880, as it may be if obtained in winter, your solution will be a true photographic ten per cent. solution. But, in summer, what is it? No one knows, and up to the present even the users and advocates of ammonia do not seem to have taken the trouble to ascertain—it may be anything. What it is will depend, first, on the strength of the liquor ammoniæ to start with; second, the number of times the stock bottle has been opened; third, the perfect or imperfect fitting of the stopper; fourth, the time the stock bottle is kept before the last of the bottle is used up.

If the stock solution of ammonia were ·880 to start with, and we require one ounce to be added to nine ounces of water, how much ought we to take from the same bottle in order to produce a solution of the same strength at the end of two or three months, the bottle in the mean time having been opened several times? As a rule, the ten per cent. solution is made up in the same manner, whether it be the beginning or end of a Winchester quart that is being dealt with.

In order to test the constancy or otherwise of ammonia as retailed by photographic dealers, we obtained two-ounce or four-ounce samples from ten different houses, the variation in strength of professedly the same material we will allow you to judge for yourselves. In each case ammonia of sp. gr. ·880 was asked for; it was marked on the label, but the lie was in the bottle.

In one case we asked for a four-ounce bottle to be filled, but were told that they did not keep it loose, as, on receipt of ammonia from the maker, it was transferred to two, four, &c., ounce bottles, in order to avoid loss of strength due to constant opening of the stock bottle. We took a two-ounce bottle, and, in order to compare it with the ammonia retailed at the drug store of the same firm, we obtained four ounces there in our own bottle. Well, with all the care of the manager of the photographic department, his sample of ammonia turned out to be weaker than the other. This must, undoubtedly, be due to the fact that the ammonia originally supplied was of inferior quality. If dealers do not take the trouble to test the materials as they receive them from the manufacturer, how can they guarantee their quality when retailed?

The method of analysis adopted was as follows:—

Ten c.c. of the strong ammonia was made up to 100 c.c. with distilled water, and ten c.c. of this, representing one c.c. of strong ammonia, taken for the analysis. This was titrated with normal sulphuric acid, using methyl orange as an indicator, and the strength of the ammonia calculated from the number of c.c. of acid required to neutralise it.

As it would be invidious to give the names of the different dealers from whom the samples of ammonia were obtained, we have designated each sample by a number. This method, we are sure, will meet with the approval of the editors of the different photographic papers. To any one, however, who is interested in the subject we shall be pleased to give privately the names. But, because a certain retail dealer supplies a sample of ammonia not quite up to strength to-day, that is no reason why to-morrow, when perhaps he opens a fresh bottle, it may not be as strong as circumstances will allow.

The Table gives grammes of NH_3 per litre, percentage by volume of NH_3 and water, and, finally, specific gravity.

No.	NH_3 Grammes Per Litre.	NH_3 Per Cent. Volume.	Specific Gravity.
1	315·2	35·8	·880
2	290·7	32·7	·888
3	289·0	32·5	·888
4	285·6	32·1	·889
5	282·2	31·7	·890
6	280·5	31·5	·890
7	280·5	31·5	·890
8	278·8	31·3	·891
9	278·8	31·3	·891
10	275·4	30·9	·892
11	272·0	30·4	·894
12	272·0	30·4	·894
13	267·0	29·8	·896
14	266·9	29·8	·896
15	263·5	29·4	·897
16	243·1	26·9	·904

In the above table the quantity of ammonia (in grammes) per litre was obtained from the analysis. Columns 2 and 3 have been obtained from Lunge and Wiernik's paper.

Liquor ammoniæ of specific gravity ·880, from this, should contain 35·8 per cent. of real ammonia. The nearest approach to this is in cases 2 and 3. The samples which yielded these results were obtained from freshly opened Winchesters, the determination being made within a couple of minutes of the opening of the bottles. No. 4 is the result of keeping a similar sample of ammonia, the stopper not being removed during the interval, one week elapsing between the opening and the analysis being made. No. 10, sample from a Winchester opened three weeks and used occasionally.

The other numbers speak for themselves. The last, however, we must draw your attention to, as in that case, instead of there being roughly thirty-three per cent. of ammonia, there is only twenty-seven per cent.—a difference of six on a total of thirty-three. This specimen is only four-fifths the strength of No. 2, and differs, if we take the total ammonia in liquor ammoniæ ·880 as 100, by twenty-five per cent.

Any one purchasing ammonia from any of these firms would naturally mix it as per usual, and call it a ten per cent. solution. He would most probably, when using No. 16, say that the particular brand of plate he was dealing with would stand much more ammonia without fogging than would another make, when perhaps he was, in the first case, using his ammonia much stronger without knowing it.

We have, we believe, fully justified ourselves from the results we have obtained and placed before you, in calling your attention to the variability and the unknown strength of ammonia as now retailed, and, if we simply cautioned you, it would be of some use; but we have in addition to suggest a remedy—not a remedy in the sense of enabling you always to obtain ammonia of the strength you may require, or according to the label; but, given any strength of ammonia, how to use it in order always to make up a photographic ten per cent. solution. A photographic ten per cent. solution of ammonia is really only about a three per cent. chemically, *i.e.*, every 100 volumes of the solution you use only contains three volumes of liquid ammonia.

One of us, at a demonstration on glass-blowing, before this Society some five years ago, suggested the use of specific gravity balls as means of enabling any one possessed of such a simple piece of apparatus always to make up his stock solution of identically the same specific gravity. It consists, as you see, of a bulb and a short stem, partly filled with water so as to load it. The end of the tube is then ground so that it is exactly balanced at a certain definite temperature in a real 2·9 per cent. solution of ammonia. If the temperature is rising, it will gradually sink, and if falling it will gradually rise.

Having one of these specific gravity balls, and wishing to prepare a ten per cent. solution (photographic), nothing is simpler. Warm some water, preferably distilled, to the temperature at which the ball is in equilibrium in the standard solution, now add ammonia one-ninth the bulk of the water, and notice the behaviour of the ball. If it remains at the top of the solution, the liquor ammoniæ is weak, and more must be added. After each addition the bottle containing the dilute ammonia should be inverted a few times in order thoroughly to mix the ingredients. The balls are made strong enough to resist any slight blows against the side of the bottle. If too much ammonia is added, then it can be brought to the right strength by the gradual addition of water. When the temperature is correct, and the ten per cent. solution exact, the bulb will only slowly rise or sink in the liquid.

When using ammonia thus prepared, there is no reason why in all cases consistent results should not be obtained. The tendency nowadays is to perform every photographic operation in a much more skilful and precise way than was the case, say, twenty years ago. Pyro we can weigh or measure with accuracy; the same is true of bromide, and so we hope it will be with ammonia now the method of doing it is pointed out. F. B. Grundy and A. Haddon.

RANGE OF GRADATION IN PRINTS AND IN NEGATIVES.

I am writing the present article in the hope of eliciting information which may be of use to myself, and perhaps to many others in a similar position to myself. If I am as successful in this respect as Mr. "Rudder Grange" has recently been, my object will have been attained. This object will, perhaps, be best understood if, as he did, I relate some of my own experience.

I have just been reading again an article in the numbers of the Journal for January 12 and 19, entitled "The Men and the Money-bags," by Mr. E. Howard Farmer, in relation to certain researches of Messrs. Hurter & Driffield. I always read with great interest an article of that class, not merely for any positive information it may contain, but also because it sets me thinking and comparing.

The problem there attempted to be worked out seems, in its more general form, to be: Under what conditions can negatives be produced with as nearly as possible the same range of gradation as the paper, on which they are to be printed, is capable of furnishing? The problem which I wish to see worked out, or to learn if it already has been worked out, is the converse of this: What are the papers which are capable of furnishing the same range of gradation which I find in my negatives, if such papers already exist? if not, by what means can they be called into existence?

I will show in what manner this question has presented itself to my own mind.

When I was first led, almost accidentally, to apply myself for a time to photography, I had not, like "Dear Richard" in the first letter of "Junius Junior," already studied "all the books published on photography;" but, for the sake of the scientific information, I had already given some attention to the subject; more especially I had read and carefully thought over parts of "Hardwich," of which I had met with a second-hand copy. One result was that, almost from the first, I aimed at producing in my negatives, confined to landscape work, as wide a range of gradation as possible. It was not very long after the commencement that my engagements took me for a certain number of months to Scotland, where, during any leisure time I could find, I continued to follow up photography largely by the wet-collodion process, having a spare room at my disposal. Near the house where I was occupied, in the Park, were two very large and much-admired lime-trees, which I was anxious to photograph on my 10×8 plates. By a mixture of some old, rotten collodion with some newer and tougher, and by other means, I had brought my chemicals into the condition which I knew, by "Hardwich," to be conducive to the production of intense negatives. I had to wait some time for a favourable day, without wind, and the sun in the position I desired. At length, at the right moment, on a day bright with clouds, and

he sun shining partially through them, I was able to expose two plates. After developing and fixing, I examined them with a kind of wonder. I had produced exactly what I had been aiming at. Where the light had acted most strongly, the silver was literally piled up; at the other end of the scale was the bare glass, and between the two a complete range of gradation.

These negatives with albumen papers (I am not sure now how far prepared by myself, or bought ready-sensitised), gave me some very vigorous prints. There was, however, another problem which was interesting me much at that time (and in which I still feel great interest), namely, what can be accomplished in water-colour painting, using a landscape photograph as a foundation. A lady whom I had induced to apply herself to water-colour painting had told me she was willing to make a trial. Accordingly, I prepared for printing some of the drawing paper which I had by me. It was a paper, which in Germany, a few years prior only, I had myself largely used for water-colour drawing when I was giving my spare time to that subject. A German-made paper, rough, but not very much so, not thick, but sufficiently tough to bear any amount of washing, and yet taking the colour very freely. That was just before the Franco-German war. The paper cost very little more than good cartridge paper in England. I prefer it to a French-made paper of about the same price, sold both then and now very extensively on the Continent; of this latter, I have some here (in Switzerland) which appears to me to resemble somewhat the German which I used. I enclose a piece with part of the water-mark.

I do not now recollect by what formula I prepared my paper, but my object was to obtain the possibility of a wide range of gradation. I found, in printing from the negatives above described, that I was obliged to use a strong light and to wait very long before all the detail in the high lights was brought out, and this happened without any detriment to the shadows. They were still in their proper gradations. The prints were very bright and vigorous, and much admired by the proprietors and others who knew the trees. Since then, those negatives have remained my ideal, and, in taking up photography again more recently under its altered conditions, one object of my endeavours has been to produce the like of those. I think I fairly know now what plates and what conditions afford me the best chance of doing so, and I have some negatives which make a certain approach to them; but, of the newer brands of paper which I have used, I have not arrived at the conviction that any one is capable of rendering the whole range of gradation in such negatives, and it is on this point that I am *à la recherche*, and in reference to it I pose my problem at the beginning.

Looking upon Mr. Farmer as a man of long and wide experience, I should feel almost inclined to argue from his article that such a paper does not exist, and should feel much obliged to any one who would kindly point out what paper comes nearest to it. A considerable variety of papers, some of great merit, seem recently to have been introduced to the market. I think it would render a great service to very many if some one of those many gentlemen who place their experience so liberally at the service of the public would attempt a somewhat regular classification of the different brands, giving, amongst other things, the range of gradation of which they are susceptible at the different parts of the scale, showing to what negatives they are best adapted. I am myself most anxious to learn which kinds would afford me the widest range of gradation for landscape negatives, such as I am most desirous of producing. Such information may be already published, in which case I should be glad to learn where I might find it. Formerly, when I laid aside my photography, I was in a fair way of following in the footsteps of "dear Richard," and reading, if not all, at least a very great part of what had then been published; but since then photography has taken an enormous development, and I get only certain glimpses of what has been written during that period.

I can quite conceive that the great majority of the work of professional photographers has to be produced under conditions which make other qualities in the paper much more necessary than those I am seeking, and that for a very large number of amateurs these same qualities may be necessary for other reasons. It is, therefore, only natural that manufacturers should be chiefly anxious to provide such papers. At the same time it seems to me probable that for certain classes of work, more especially of landscape, there must now be such a considerable number working on lines such as to render the kind of paper I am seeking desirable, that it would well answer the purpose of some one of the many enterprising firms or individuals to bring forward as a speciality such a paper, one to render the widest possible range of tones in landscape negatives. I think it should be a plain drawing paper, not thick, only slightly rough, not too porous, but rather of somewhat firm texture. W. WASHAM.

LETTERS TO A YOUNG PHOTOGRAPHER.—II.

MY DEAR RICHARD,—I am pleased to hear that you have recovered from the effects of your accident. It was, undoubtedly, a very narrow escape, and your good fortune in living next door to a chemist having some knowledge of poisons and their antidotes certainly saved your life. You will, I hope, profit by the moral of the occurrence, and in future will not take your whisky and water into your dark room, and so avoid the risk of drinking something else in mistake for it. For, as far as outward appearances go, there is, in semi-darkness, a fatal resemblance between whisky and water and a solution of cyanide of potassium, and I do not wonder that, in the preoccupied state in which you must have been when in your dark room, you mistook the cyanide for the whisky, and drank about three ounces of it before you discovered your error. Excuse me hinting that, in future, it will conduce to your safety and comfort if you reserve your dark room exclusively for photographic uses, and choose for your libations some better-lighted apartment, in which you are not in the habit of covering the table with vessels containing solutions of deadly poisons. I know, of course, my dear Richard, that there are *many* photographers who habitually solace and fortify themselves, when developing, with a wee drappie from a conveniently placed tumbler; but these are old and well-seasoned practitioners, who are incapable of your blunder. With them, indeed, though the senses of sight and smell may possibly mislead or betray, the sense of touch has been developed to such an abnormal degree of refinement that they can actually *feel* the right glass, even in total darkness.

On the other hand, if you are inclined to ignore my recommendations on this point, at least grant me the favour of placing, in a conspicuous part of your dark room, a boldly printed table of poisons and their antidotes, with the latter made up ready for emergencies, and plainly labelled. Also have the installation placed near to a gas jet fitted with one of those handy little byepasses which makes the flame invisible, but does not turn it quite out. Thus, in case of accident, you will be able at once to place your hand on the necessary antidote. As I know you are an earnest seeker after scientific truth, and take nothing for granted, you might also, at an early date, devote a little leisure to consuming all the various photographic poisons in fatal doses, and then taking the antidotes for them. This will give you increased confidence in the efficacy of those antidotes, and will place you in the proud position of feeling that, by poisoning yourself experimentally, you have conferred a vast benefit on the human race. Moreover, should any of the experiments prove unsuccessful, your reward would still be great, for posterity would hail you as a martyr to science, and might possibly signify the same in memorial marble.

From the specimen prints you send, I observe that you are progressing in your work. The negative of the group would, I fancy, have stood a little more development, as there are indications of detail in the figures which, with some prolongation of development, would have given these latter a less silhouette-like appearance than they betray. As you rightly surmise, the advantage of taking objects in full sunlight is that you get plenty of illumination on them, and can shorten your exposure, but in this instance what you have gained in one direction you have lost in another, as the faces of your friends, though perhaps full of expression, have what some inappreciative critics might consider a painful ghastliness, although other and more sympathetic students of your work would possibly recognise it as a new departure in lighting effects. My own preference is for that pleasing conjunction of round modelling and softness which is obtainable by carefully controlling and regulating the access of the light to the sitters' faces, and it might be worth your while to defer somewhat to conventional ideas on the subject by first of all grounding yourself in the old methods of lighting before giving full rein to your own daring individualism in this respect. Of course there is the danger that by this you might be seduced into a slavish imitation and recognition of the antiquated kind of effects with which most people, even of deep artistic instincts, are content; but you will be consoled by the reflection that the abnegation of your originality will save you from the sneers of those superficially minded persons who mistake the slightest revolt against well-established conventionality as symptomatic of ignorance and incapacity.

You kept your camera beautifully "plumb" when taking this group, and the horizontal lines of the house and the disposition of the figures into three straight rows, each person being placed apparently at a carefully measured distance from the other, and all looking fixedly and straight at the camera, is a triumph of geometrical effect, at which an architect or a matematician would rejoice.

You have evidently discarded your early predilection for differential focussing, as, though the house is situated apparently some thirty feet behind the figures, the entire photograph is a perfect mass of wonderfully fine definition. You may pardonably congratulate yourself on having obtained a negative which would stand enlargement to a truly enormous extent before the sharpness of the result began to be impaired. But here again, my dear Richard, it is my duty to put before you the circumstance that these undeniably excellent qualities of your group do not entirely accord with the canons that usually govern such cases. In fact, though many photographers still regard the taking of a group as an opportunity for producing effects in geometrical design,

quite a large number of them endeavour to show that by a freer and less constrained style of treatment the *tout-ensemble* may give some evidence of being both photographically and æsthetically true. So that a photographer of this kind would infallibly have taken that group so as to show much less of the house, and in perspective; he would have placed the figures so as to have broken up the straight lines into a harmonious grouping; he would have given ease, difference and freedom of pose to the figures; he would not have had them all looking one way; he would not have used such a small stop; he would have thrown the background out of focus; he would have been content with a little less foreground; and, in short, he would have endeavoured to make his group a collection of natural and characteristic portraits, as a group, it is mostly thought, should be. I do not think I need say more on this aspect of the matter, except to quote the two words which newspaper writers invariably employ when they are expected to make a comment, and do not exactly know what to say. So, *verb. sap!*

The portrait is characterised by the same peculiarities of lighting and development as the group, and, being that of a young lady with whom I believe you are shortly to contract a matrimonal alliance, it must appear, to one person, and that not necessarily the young lady herself, a charming counterfeit presentment of a charming original. I hope, however, that it is not a good likeness—not only because the photographic art is incapable of doing justice to female loveliness, but also because this portrait shows the young lady to be somewhat different in appearance to what I had imagined her to be. It is courageous of you not to have flattered her, and she will no doubt admire you, both for this and for your skill and boldness in rendering the comely countenance of a lady of eighteen in the same manner you would have employed had your sitter been a wrinkled man of eighty. You ask my opinion of the portrait *as* a portrait before sending it to her. Well, you have it. But, were I in your shoes, my dear Richard, I should not let the young lady see this portrait of herself until after you were married Let it come—and it assuredly would—as a surprise to her. If, however, you *must* redeem your promise to her to let her have a copy forthwith, I hope her appreciation of your loving skill will not fall short of your anticipations. I need not warn you that in such a matter as this ladies are allowed to be capricious, and rarely neglect to avail themselves of the privilege.

Of the landscape and of the prints, considered as examples of photographic printing, I will say something in a future letter, as this one will probably give you sufficient material for reflection without any further addition. Would you mind informing me by what process the prints are made? From the three you send I can't for the life of me tell the method you have employed, although, as you know, I am practically acquainted with every process in use nowadays. I never saw such prints as yours before. Please tell me if they really *are* photographically produced, and how?—Yours truly, JUNIUS JUNIOR.

P.S.—Better not let the young lady see your portrait of her until you have *slightly* reduced the negative. Try this solution:—

Nitric acid	9 ounces,
Water	1 ounce,

And let me know the result. J. J.

ACTION OF LIGHT ON DYES.

THE following is a summary of the report of the Committee on th action of light upon dyed colours, presented to the Chemical Section o the British Association:—

During the year a large number of wool and silk patterns, dyed with various natural and artificial orange and yellow colouring matters, had been examined with respect to their power of resisting the fading action of light. The patterns were exposed at Adel, near Leeds, in the grounds of Mr. James A. Hirst. Each dyed pattern was divided into six pieces, one of which was protected from the action of light, while the others were exposed for different periods of time. On silk, the relative fastness of the various colours was, for the most part, the same as on wool, the differences being unimportant. Orange and yellow patterns give a comparatively large number of satisfactorily permanent colours. In the more or less fugitive class were to be found all the basic colours, all the nitro-phenols, with the exception of palatine orange, and all the bright yellows derived from the natural colouring matters by means of aluminium and tin mordants, with the exception of those obtained from weld. Comparatively few azo colours were met with in this group. By far the largest number of yellows, ranging from "moderately fast" to "very fast," were to be found among the azo colours. Specially important were those in which salicylic acid was a constituent element, since not only did this impart to the colour the power of forming more or less stable lakes with chromium and aluminium mordants, but it appeared frequently to give the colours the quality of fastness to light, even when no mordant was applied. The colours obtained with aluminium were practically as fast as those fixed with cromium, since the first-named mordant gave much brighter and purer yellows. The tin mordant, so useful in the production of the most brilliant orange and yellow colours obtainable from the natural colouring matters, seemed, however, to be of little or no advantage in connexion with most of these azo-mordant colours, no doubt because they were susceptible to the reducing action of the mordant usually employed for wool, viz., stannous chloride. Very interesting in point of fastness to light were the azoxy colours, and, although, unfortunately, apt to dye wool somewhat irregularly, giving speckled-looking colours, they were admirably adapted for silk and cotton. Another interesting little group was that which includes tartrazin, a colour, not only noteworthy for its fastness to light, but also because of its brilliancy and purity. The fastness of alizarin orange was worthy of special mention, for it was probably greater even than that exhibited by most other colours of the alizarin group, and it showed the peculiar darkening action exerted by the light, probably in consequence of the presence of the nitro group. It was remarkable how few really fast yellows were derived from the natural colouring matters, and these were chiefly the olive yellows obtained with chromium mordant. The only fast, and, at the same time, bright, natural yellows, were those derived from the weld, and, since the dye-stuff was now of little general importance to the dyer, its cultivation had become extremely limited, and was gradually being given up. It was fortunate, therefore, that science had been able to replace it by efficient substitutes, so far, at least, as permanency towards light was concerned. The experiments had already abundantly proved that the popular opinion that the coal-tar dye-stuffs included only such as yielded more or less fugitive colours, was entirely false; indeed, it was perfectly safe to assume that coal tar was the source from which the greatest number of colours fast to light were derived at the present time, and this seemed to be specially true of the red and yellow colours.

THE LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MR. P. EVERITT, the new Honorary Secretary of the London and Provincial Photographic Association, has signalised his accession to office by arranging the following interesting programme of papers, &c., for the following ten months. We may here say that Mr. Everitt, whose address is 88, Evering-road, Stoke Newington, N., will be happy to receive proposals of membership for the Association the subscription to which is 5*s.* per annum. The meetings are held each Thursday evening, at 8 o'clock, at 15, Aldersgate-street, E.C.

September 6, 1894, *Some Unrecognised Uses of Single Lenses*, J. Traill Taylor. 13, Lantern Entertainment—*A Day at Winchester*, Claud S. Scott. 20, *Demonstration of the Klic Process of Photogravure*, Horace Wilmer. 27, Open Evening. October 4, *The Fish Glue Photo-engraving Process*, Henri Calmels. 11, Lantern Entertainment, members' slides. 18, *Polarisation of Light; its Bearing on Photography* (accompanied by a practical demonstration with the lantern), Birt Acres. 25, Open Evening. November 1, *System*, Walter D. Welford. 8, Lantern Entertainment (ladies specially invited), Mrs. Catherine Weed Ward. 15, *Development and Toning of Bromide Prints*, W. Ethelbert Henry, C.E. 22, *Impressions of Impressionism*, Thomas Bedding. 29, Open Evening. December 6, *Fading of Albumenised Prints*, A. Haddon. 13, Lantern Evening, members' slides. 20, *A Point in connexion with Plate-coating*, R. Child Bayley. 27, Open Evening. January 3, 1895, *Collodio-chloride Emulsion for Transparencies*, J. S. Teape. 10, Lantern Entertainment, S. J. Beckett. 17, *The Hand Camera: Then and Now*, W. D. Welford. 24, *Photomicrography*, with lantern illustrations, T. E. Freshwater. 31, Open Evening. February 7, *Some Further Experiments in Colour Photography*, E. J. Wall. 14, Lantern Entertainment: *The Far East*, R. P. Drage. 21, *Development and Fixing*, J. Cadett. 28, Open Evening. March 7, *The Construction and Sanitation of Studios and Dark Rooms, as affected by the Building Acts*, G. D. Sargeant. 14, Lantern Entertainment, members' slides. 21, *Photography and Cycling*, E. H. Bayston. 28, Open Evening. April 4, *Stereoscopic Photography*, Thomas Bedding. 11, Lantern Entertainment, members' slides. 18, Paper by A. Haddon. 25, Open Evening. May 2, *Mounting and Framing Photographs*, with Demonstration, W. F. Slater. 9, Lantern Entertainment, members' slides. 16, *Panoramic Photography*, J. Traill Taylor. 23, Paper by R. Child Bayley. 30, Open Evening. June 6, *Photography: Past, Present, and Future*, W. Cobb. 13, Paper by C. H. Oakden. 20, *Spirit Photographs: Should they command Belief?* P. Everitt. 27, Annual Meeting. Ladies are specially invited to the Lantern Entertainments.

"REFLECTIONS IN CAMERA."

How is it, we wonder, that, when the ordinary or non-photographic journalist sets out to be funny at the expense of photography, he invariably succeeds in making himself look foolish? Here, for example, is a contributor to our sprightly contemporary, the *Star*, who, under the

above heading, makes photography the subject of an article which is apparently intended to be the vehicle of a mixture of humour and technical knowledge. The humour is of a funereal kind, and the technical knowledge is grotesquely unsound. After some venerable platitudes over the "barbarity" of being parentally compelled to be photographed in early youth, the writer goes on to credit the photographer with ideas as to what posterity expects of him:—

"His ambition is to make a picture rather than to preserve a likeness between the photo and the original, so that any study of the latter's idiosyncrasies would be merely waste time. He has a stereotyped range of poses all extremely artificial, which every sitter has to adopt, however foreign they may be to his habit and personality. As most people have some tricks of gesture and attitude which belong to them as much as their nose and eyes, the result of the photographer's pose—which he enforces with an instrument of torture screwed around the head—is apt to rob the photograph of all characteristic. The features, however, remain to bear witness to the sitter's identity, but not for long. After the negative has been printed, the retoucher may work his own sweet will upon it, and, under the excuse of correcting Nature's imperfections, he speedily obliterates any resemblance which the camera may have caught. Thus, by the time the photograph reaches you, the likeness has been so ruthlessly tampered with, that in nine cases out of ten your own mother would not recognise her child."

Why "photo" and not "photograph"? The harmless, necessary head-rest "an instrument of torture"! Stay, perhaps this is meant for humour, the "new" humour! Professional photographers will be interested to know that negatives are retouched *after* being printed.

There are two "distinct schools" in photography, we are told; but their characteristics as here given have probably not been perceived by anybody but the profound author of the article:—

"Of late years one or two artists, like Mr. Frank (*sic*) Hollyer, have realised the artistic possibilities of the camera, and have done something especially in the direction of landscape towards lifting photography as a means of holding the mirror up to nature from the level of a purely mechanical method. Already in photography, as in art, there are two distinct schools—the idealistic and the realistic—the former giving something at least of pictorial beauty and illusion, the latter relying for the effect solely on the perfection of technical details. It is hard to say which school turns out the best portrait, for neither are (*sic*) really satisfactory. In the vague impressionism of the former, likeness of feature is apt to be lost, but these photos have generally a certain beauty and distinction which in the latter case is entirely absent. The features, somewhat vulgarised, may be there, but of the soul of the sitter there is no suggestion. One must admit in the end that the English photographer is a long way behind his Parisian or even American rival."

The writer's knowledge of English, French, and American portraiture is clearly not extensive, but it is peculiar and unintelligent. Having made the remarkable discovery that women have "begun" to "labour in the vineyard of photography," and sagely opining that he sees "no reason why women of artistic ability should not make excellent photographers," the writer obliges us with the following views on the hand camera and its uses. We seem to have read something like it, equally silly and exaggerated, before:—

"With the production of cheap cameras, photography has become an amusement for the unemployed. That infernal machine the Kodak and its fellows has added a new terror to life, menacing as it does the privacy of the most obscure, rendering friendship an insecurity, and love-making a positive danger. Even when manipulated with the most innocent intentions, the cheap camera must still be regarded as an enemy of the human race, for its inexpensive attractions are responsible for the fearsome ubiquity of the amateur photographer. All amateurs are a scourge to the earnest soul, but I really think the irrepressible youth or the enthusiastic maiden who asks nothing better than to be your guide, photographer, and friend, is the most difficult of all amateurs to elude. There is literally no peace in his vicinity. Moreover, you ignore him at your peril; for, should you turn a deaf ear to his importunity for daily or hourly sittings, you run the risk of being taken unawares from an adjacent coign of vantage. In either case you abide with the pleasing conscientiousness that some frightful travesty of your features, some horrible libel on your charms, is being exhibited as your portrait to all whom it may or may not concern. Reticence is a quality not in the composition of amateurs. The blush begotten of failure is a purely professional weakness."

The *naïve* admission contained in one of the final sentences of this precious farrago of rubbish appropriately concludes the article: "With my own photographs, I have always found that those selected by my friends as bearing the closest resemblance were invariably those which I considered most unlike myself." Exactly; and we may remark that this ingenious gentleman is just about as competent to judge other people's photographs as he is his own. Good *Star*, an' thou lovest us, spare your photographic readers this kind of thing in future!

THE PHOTOGRAPHIC SALON.

Mr Alfred Maskell writes from the Dudley Gallery, Egyptian Hall, Piccadilly, W.: "There are on all sides so many inquiries concerning the regulations of the Photographic Salon for this year that I venture to ask the favour of your kind publicity of the conditions annexed to our entry forms. Some people appear to be doubtful whether it is open to all to send in. Of course this is so, acceptance for exhibition being subject to the decision of the Committee of Selection. I may say that I have already despatched a very large number of circulars and entry forms, but my lists do not include all who may be anxious for information, and whom the power of the Press will probably reach. Forms of entry will be sent on application. May I add that the prospects of an Exhibition, much surpassing in interest that of last year, are most encouraging?"

The following are the particulars of the Exhibition and the conditions of entry:

1. The Photographic Salon, 1894 (second year), will be held at the Dudley Gallery (Egyptian Hall), Piccadilly, London, W., from October 1 to November 4, 1894.

2. The aim of the committee is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution.

3. Careful consideration will be given to all pictures entered for exhibition, and a selection of works of pictorial merit made by a committee. Pictures which have already been publicly exhibited in London will not be accepted.

4. No awards are offered, and no charge made to exhibitors.

5. The usual charge of one shilling will be made to the public for admission. Exhibitors will be entitled to a season ticket.

6. Arrangements will be made for the sale of pictures, if desired, and a commission of 15 per cent. will be charged on sales effected.

Conditions of Entry, &c.

1. Each picture must be separately framed, and each frame must bear on the back name of exhibitor, number and title of picture, and price, if offered for sale, corresponding to the particulars on the entry form.

2. The committee have appointed Messrs. Polak & Co., 63, Wardour-street, W., as their agents, who will unpack, repack, and deliver to carriers all exhibits forwarded or delivered to them. Every care will be taken, but the committee will not be responsible for damage.

3. The form of entry, duly filled up, must be sent with, or previous to, exhibits, and addressed to the agents (except as provided in clause 6).

4. All exhibits must be delivered, carriage paid.

5. Pictures sent *in packing-cases* must be delivered at the agents' of the Salon not later than Thursday, September 20. Cases should be marked with some distinctive mark painted on the wood of the case.

6. Frames will be received also at the Dudley Gallery on Friday, September 21, from 11 a.m. to 1 p.m. In this case they must be delivered in the gallery, *accompanied by their entry form*, without packing or wrappers of any kind.

7. A fee of one shilling per week per frame will be charged on all frames remaining at the agents' after November 15, unless delay in removing does not occur through the fault of the owner.

8. At the close of the Exhibition all pictures will be immediately returned to Messrs. Polak & Co. Exception will, however, be made on the evening of closing, when pictures may be taken out of the Gallery (without packing of any kind) on signing the receipt book, between the hours of 9 p.m. and 11 p.m. Notice of intention so to remove pictures on closing day must be addressed to the Secretary before 6 p.m. on that day.

9. It would be of great assistance if all packing-cases were fastened with screws, instead of nails, or furnished with locks and hinges. To avoid damage, frames should have no projecting nails.

10. All correspondence relating to the packing, carriage, delivery, or return of exhibits is to be addressed to the agents, Messrs. Polak & Co., 63, Wardour-street, London, W.

HAS THE PROFESSIONAL ANY USE FOR THE HAND CAMERA?

[A free translation from the German by Julius F. Sachse, after G. Heinrich in the *Photographische Chronik.*]

[American Journal of Photography.]

With the average professional photographer, the hand camera is the distinctive mark or badge of the pronounced amateur. He looks down with contempt upon the whole guild of button-pressers, and consoles himself with the thought that such child's play is unworthy of the serious

consideration or notice of any self-respecting photographic bread-winner.

Then, again, he is fully convinced in his own mind that little or no business or profit can be gained by running around with a hand camera. These are opinions shared in common by most all of the fraternity.

And yet this view is an erroneous one, as the hand camera, under certain conditions, is well suited for commercial purposes; and the writer wishes here to emphasise, that no professional photographer who wants to be abreast of the times can afford to be without a hand camera, even granting the fact that it would not be brought into daily requisition.

There are multitudes of cases where the hand camera can be made to well pay for itself. However, it is well to remember here that it will not do to judge of the value of such apparatus by the usual results shown and attributed to that class of photographic apparatus.

A good hand camera in competent hands, with proper manipulation, is capable of producing wonderful results.

In all large communities there are to be found firms or establishments whose chief specialty consists in making instantaneous views, and of what is known as "accident" photography. Such firms are equipped with special portable outfits, made for the purpose, and which, suitable as they may be, are also expensive; consequently, the photographer who is called upon only at intervals for such work can but with difficulty compete with establishments that make a specialty of this branch of work.

But in smaller towns or communities the situation is entirely different. When anything happens that it is desirable or requisite to immortalise, by aid of instantaneous photography—and such cases are by no means rare—it is ludicrous to observe the procedure of the local or resident photographers, the tremendous show of cameras lugged to the scene, often with enormous portrait objectives, and unsteady tripods or unstable supports, an array of implements entirely unwarranted by the meagre results obtained.

Now, how different would the case be if the above operators were in possession of suitable hand cameras of approved make and construction, and were familiar with the manipulation and scope of their instruments. Then the parade of paraphernalia, as in the first instance, would not only be less imposing, but little apparatus would have to be handled, and that without expense or loss of time, and what is more still important than all, better results would be the reward.

With a suitable hand camera of modern construction, and sensitive material, together with a fair light, almost any photographic obstacle may be surmounted.

Naturally no reference is here made to "shoddy boxes," such as are made for persons who have means enough to buy an outfit one day because it is cheap, and throw it aside the next day because it is useless.

In a hand camera the main requisites should be a good objective or lens. To obtain the best results, a Zeiss anastigmat of $5\frac{1}{2}$ in. focus, that works with *f*-6·3, or better still a Goerz double anastigmat *f*-7·7, with 6 in. focus should be selected. Of the two makes the latter objectives are preferable, as, notwithstanding its lesser illuminating power, a 4×5 plate exposed with a full opening is covered with an absolute microscopic sharpness of definition. Stopping down only becomes a necessity when the light is too strong or a great depth of focus is desirable.

The question will now arise with the professional photographer, how can the small pictures thus obtained be utilised, how can he realise a profit from his material and labour—where are purchasers to be found for such small prints; and, above all, who will be willing to pay a remunerative price for such pictures?

If the operator at this point will recall the possibilities of his enlarging apparatus, it must dawn upon him that, if that special department of the business ever paid, it must do doubly so with such subjects as are offered by snap-shots. Granting that the camera was held steady, and a reasonable focus taken, the resultant negatives obtained by use of either of the above-named objectives, or any other good lens, will be found to be almost microscopically sharp, and will permit of considerable enlargement without suffering in definition.

In connexion with this subject it is advisable to use a transparency or gelatino-albumen plate (such as Carbutt A) for the diapositive. Care should be exercised in exposure and development to obtain a picture soft and full of detail in both high lights and shadows, it thus becomes an easy matter to enlarge this positive in the camera to 5×7 or $6\frac{1}{2} \times 8\frac{1}{2}$ without loss of definition. If requisite care is exercised, the enlarged negative cannot be distinguished from an original exposure.

When hand-camera negatives are to be enlarged it is absolutely necessary that the original negative be developed with special reference to its subsequent use. It should be rich in detail and soft, hardness and contrasts must always be avoided. It is not difficult to obtain these results, if the subject was properly lighted, for the plates used and time of exposure. The only thing then wanted is a suitable developer.

Experience has proved that the best solution for this purpose is the ordinary oxalate and iron developer used in connexion with a preliminary bath of hypo (1 to 2000). But, even better than this old stand-by, Rodinal now looms up. When diluted 1 to 100, six or eight plates or films can be developed at one time in the same tray, care being taken to keep it covered. The development proceeds so gradually that even a larger number can be observed at a time.

Granted that a good hand camera equipped with a suitable anastigmat is rather expensive in the first instance, any enterprising photographer can soon reimburse himself for the outlay by the income derived from its use.

The hand camera has long since ceased to be a scientific toy, and has become a necessary adjunct to the outfit of every professional photographer who wishes to keep abreast with the present age of scientific development.

COLOUR-VALUE NEGATIVES FOR TYPE COLOUR-PRINTING.

[Canadian Photographic Journal.]

I BELIEVE it has been accepted without contradiction, and from authorities seemingly beyond question, that the photographic sensitive plate is rendered superior extra-sensitive to certain colours of the spectrum by being bathed in certain dyes, or, as in the case of the so-called ortho or isochromatic dry plates of commerce, having the emulsion prepared with those dyes before coating.

This theory of bathing the ordinary plate in these supposed sensitive-increasing dyes, is simply needless and erroneous, as any sensibility obtained by plates so treated to the less luminous colours of the spectrum can as readily be obtained with the so-called ordinary plate when used with proper screens or colour-filters. I am led to make and uphold this statement after much investigation and experimenting toward securing a satisfactory medium or plate for use in colour-value work in connexion with the half-tone process.

In the obtaining of these negatives, my wants could easily have been met by making the colour-value negatives in orthochromatic plates, thence printing transparencies, from which to obtain the half-tone line negatives for the colour blocks. Gelatine negatives on ordinary plates are but a poor substitute for the collodion plate in process work, and the dye stuff in the ortho plate but makes matters worse for the worker. It will be readily perceived, then, that in such a case the gelatine colour-value plates of commerce were useless for this work, and entirely out of the question. If I were to secure colour-value half-tone negatives *in the field direct*, I must needs look for some simpler and more suitable means as a medium towards obtaining practicable work and passable results. Such being my desire, I commenced a series of experiments, the results of which have placed beyond all doubt the suitableness of the ordinary gelatine bromo-iodide plate for the rendering of colour values.

As there are at present many workers turning their attention toward this new colour work, I presume a few remarks upon the same may probably point a road which will offer less pitfalls to the inexperienced worker, helping him to an earlier attainment of his desires than did he pioneer every step. Recognising the qualities of a good, richly coated bromo-iodide plate for this work, I put myself in communication with a firm of plate-makers to attain my desires. The firm in question kindly undertook to prepare such a plate, rich in silver, and with rather less glue, such being my wish, as I find glue an unimportant medium toward securing density in process work.

In the few preliminary tests made with the samples of such plates made for this work, I look upon the results as simply astonishing, no longer looking upon the gelatine plate as an inefficient medium for such work.

The rendering of the colour values pleasing me so well with ordinary plates at an earlier date when used in conjunction with my own colour-filters, I had secured a set of Carbutt's, to assure myself in a thorough manner of the qualities of these plates, and with these screens my tests were made. I can now feel confident, after tests made with these screens in combination with these plates, in claiming qualities for them which so far have been accorded orthochromatic plates alone. I would, however, have it understood that I *do not* claim the same extreme sensitiveness of rapidity in this work for *every make* of plate, but would have the fact or principle recognised, that such a plate as was used by me (bromo-iodide) is sensitive to any colour that may be obtained on the orthochromatic plates of commerce.

This fact, as proven clearly in my work, introduces a new theory, or rather proves by *facts* that the dyeing method does not enhance the

sensibility of a plate of *given rapidity* to the red, yellow, or orange values in like proportion, as to the chemical colours of the spectrum, but simply *retards* that complementary colour to that of the dye used with the plate, or, in other words, acts as a colour screen, only in a lesser degree.

This is the more clearly proven when we consider that to obtain the less refrangible colours of the spectrum in their purity or true colour values, as in the obtaining of negatives for photochromatic printing, the dyed or orthocromatic plate is an inefficient and useless medium in itself, and to obtain truthful results must be used in conjunction with suitable colour-filters.

I would have it understood, therefore, that the position I take in reference to these facts is that I perceive in the sensitive dyed plate the salts of silver, or sensitive medium, protected by the coloured gelatine, said gelatine *retarding* the complementary rays of light, or colour, to that of the dye used the prolonged exposure in every case proving that the principal factor is time. The complementary colour being made *inactive* to a greater or less degree, according to the density of dye used, or screen in the case of ordinary plates, screen or dye fulfilling one and the same purpose. MACFARLANE ANDERSON.

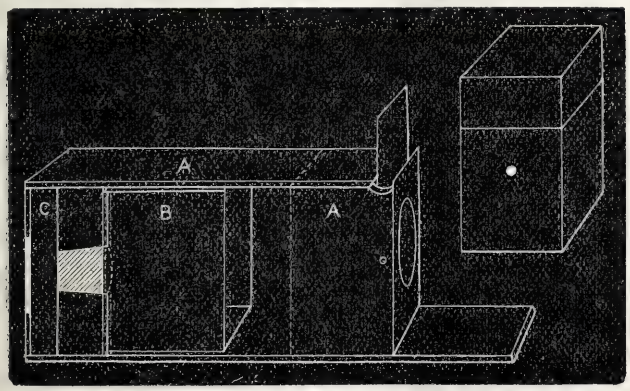
A SIMPLE FORM OF HAND CAMERA.

IN one of the numerous competitions of recent years offered by one of the newer contemporaries of THE BRITISH JOURNAL OF PHOTOGRAPHY, it struck me as a strange satire upon the wonderful qualities of the numerous hand cameras on the market that at least one of the most successful competitors should be using an apparatus, as the old parish clerk said of the hymn, "of his own composure."

Now, doubtless, there are many reasons which induce people to make their own cameras, with most of which we have no concern. It is pretty certain, however, that a motive of economy is not the most important in all those cases. It is enough to say that a man may pay ten guineas for a hand camera, and in exchange get one far from perfect; another may get one for a guinea, and find it a wonderfully good investment.

My own plunge into this business was to find employment for a very excellent little lens by an eminent maker, a lens which cost, by itself, fully the price of the average *half-plate outfit*, but of which the present-day amateur, being by no means "strong" on photographic optics, has never been a purchaser.

The annexed drawing shows clearly enough the construction of an apparatus I have certainly found quite a success; and it may be



useful to some modest and retiring dispositions who prefer the country to the *town*, where, perhaps, it might be rather too demonstrative.

The camera consists practically of a box of three compartments, representing—

A.—The body.

B.—The division carrying lens.

C.—The division for shutter.

B is really a strong cardboard box, open at one end, and made to slide and, of course, accurately fit A. A piece of ground glass being inserted in grooves at the opposite end of A, which end may have a circular hole cut in to facilitate focussing; the lens is screwed on, adjusted to focus, and fixed, every care being taken to prevent the ingress of light, except through the lens.

C bears a revolving, circular diaphragm plate and a simple drop shutter, time exposures being provided for by fitting a velvet-covered cork felt plug into a two-inch diameter opening in the end fronting C.

The baseboard at back extends some two inches ($2\frac{3}{4}$ for $\frac{1}{4}$ plates) in order to carry a dry-plate box, grooved for thirteen plates.

This box is made in mahogany, somewhat similar in pattern to Arundel & Marshall's. It is quite light-light, the lid lined to the edges with black velvet, and has two large-headed screws put in, one at each end, using these to hold it by rubber bands to the camera.

The box (fitted with plates, or any number to one dozen) is put on the baseboard, and held there with strong rubber bands, one going round from studs on the camera and the other under the base. The hinder part of camera, as far as the dotted lines, is now enveloped in a light-tight sleeve, and we may then proceed to "fire away."

The introduction of the hand into the sleeve—to remove the lid of box, remove a plate, and place it in position—takes no more time than it does to write these lines; and, on the other hand, we have absolute safety from light. The apparatus can be readily separated and detached, if more convenient for travelling; spare boxes of plates may be carried; there is complete isolation of plates; the lens and other working parts are easily got at and cleaned, and the whole is very light and portable. J. PIKE.

Our Editorial Table.

CADETT'S "LIGHTNING" AND "PROFESSIONAL" PLATES.

MESSRS. CADETT & NEALL, of Ashtead, Surrey, have sent us samples of their "Professional" and "Lightning" plates of their most recent make. These we have taken the opportunity of testing in the camera. The "Professional," which are marked 80, on the Hurter & Driffield scale, are rather above the average of medium rapidity, and, in our hands, yielded negatives of great brilliancy and clearness, and with the acme of density and gradation. The "Lightning" plate, marked 138, we found, while reaching the most desirable limits of rapidity for ordinary work, to embody all the highly valued features of a slower plate, that is, in regard to freedom from fog, with sparkling robustness of image. Undoubtedly, the manufacture of dry plates has, in the hands of Messrs. Cadett & Neall, been elevated to the dignity of a technical art, as the manipulation of plates of their production imparts a great sensation of pleasure to the users of them, their development being delightfully simple and easy. We may say that both brands mentioned evidently contain a handsome percentage of silver haloid, and we note with satisfaction that the half-plate size are packed film to film, folded as it were, without the films being separated. This is handy for manufacturer and user alike. So long as Messrs. Cadett & Neall's plates touch their present high level mark of technical perfection, so long do we predict that they will enjoy and merit a continuance of the popularity they now possess.

HADDON AND GRUNDY'S TEN PER CENT. AMMONIA SPECIFIC GRAVITY BULBS.

MESSRS. HADDON & GRUNDY are introducing specific gravity balls for enabling the users of liquor ammoniæ in development always to make up the stock solution of identically the same specific gravity. The ball consists of a bulb and short stem, partially filled with water so as to load it. The bulb rises or sinks at a certain temperature, say 70° F., in the ten per cent. solution, each bulb being as it were standardised for the temperature named or an approximation thereof. We have had one of these little bulbs in use, and can speak as to the value of its use and simplicity in action. The method of using is as follows: In order to prepare a "ten per cent." solution of ammonia, take nine volumes of distilled water at the above temperature, add one volume of strong ammonia, and ascertain by means of a thermometer that the temperature is 70° F.; drop bulb into bottle containing mixture and note its behaviour. If it rises rapidly to the surface, add strong ammonia drop by drop, till it slowly sinks, shaking the bottle after each addition; if, on the contrary, the bulb sinks, add water little by little till it slowly rises. If the mixture is of exactly ten per cent. strength, the specific gravity ball will very slowly pass the bulb of the thermometer at the temperature stated on this certificate. These specific gravity bulbs are, we believe, sold by Mr. J. Fallowfield, of Charing Cross-road, W.C.

CONVENTION PHOTOGRAPHS.

WE are indebted to Mr. A. Seaman, of Chesterfield, for several stereoscopic views taken by that gentleman, and in his own excellent

style, during Convention week. Some taken at Powerscourt are of special excellence.

Mr. Conrad Beck, too, favours us with some excellent fruits of his skill in using his "Frena" camera. In one of them we have a gentleman successfully shot while photographing Howth Harbour from the side of a hill so steep as to have necessitated one leg of his tripod being placed in almost a horizontal position, doubtless much more convenient than graceful. Hand cameras, such as the "Frena" (of which we purpose saying something on an early occasion), sometimes possess special advantages over stand cameras.

Price-lists and Catalogues.

The illustrated catalogue of Messrs. Curtis Brothers, Suffolk-street, Dublin, is a species of aristocrat in its way. It is beautifully printed on thick, fine paper, and contains 226 pages all well filled with interesting matter descriptive of apparatus of their own and selected makes. Judging from the description given of their "Trinity" hand camera, it appears to be an excellent instrument at a very moderate price. The catalogue of Messrs. Wiggin & Son, Ipswich, also contains a well-selected assortment of requisites for amateurs, and will be useful to local photographers.

Sunrise Land.

By Annie Berlyn. London: Jarrold & Sons.

This book tells of rambles in Eastern England. Although the authoress repudiates the idea, the book may fittingly be described as an illustrated guide of the more comprehensive class, the illustrations being drawn with a free hand and executed in a sketchy style. The capital of "Sunrise Land" is, of course, Norwich, the city of churches, and Norwich accordingly leads off the descriptive material. But many other towns and villages along the coast come in for description, such as Cromer, Harwich, Aldeburgh, Chelmsford, and Ipswich. The authoress is sympathetic in her descriptions, and the value of the volume is enhanced by being accompanied by guides to various places on the Great Eastern Railway.

Edwards's Isochromatic Snap-shot Plates and Films.

Messrs. B. J. Edwards & Co. have enabled us to make trial of the above for the most rapid photography. That they are specially suitable for hand-camera work is amply apparent from their requiring only "one-sixth the exposure of ordinary plates or films." The quality of Messrs. Edwards & Co.'s negative surfaces has so long been known for its excellence that we are spared the necessity for repeating what has been said over and over again.

The Stereoscope and Stereoscopic Photography.

London and Bradford: Percy Lund & Co.

This volume is translated by Mr. Matthew Surface from the French of F. Drouin, and hence we have the subject treated from a Frenchman's point of view. While the book contains matter that is of scientific interest, the writings of Sir David Brewster forming a solid basis for this, yet could we have wished that the practical part of stereoscopy had come in for a larger share of treatment at the hands of M. Drouin. He appears to take for granted that the average photographer does not need information of an elementary nature. The book is a readable one, however, is well illustrated, and well got up.

The "Rhun-eesi" Curtain Pole Company send us a sample of a cornice moulding containing a slot in which hooks for pictures or curtains are introduced in such a manner as to enable them to travel easily along the cornice.

News and Notes.

An Intercolonial Photographic Exhibition and Congress will be held by the Gordon College Amateur Photographic Association, at Geelong, Victoria, next Easter.

In connexion with the Aquarium Optical Exhibition, several photographic competitions are announced by *Pearson's Weekly*. Particulars are given in that paper for August 18.

Royal Photographic Society of Great Britain.—Technical Meeting, August 28, at eight p.m., at 50, Great Russell-street.—*Limelight Apparatus.* The subject will be introduced by Mr. R. R. Beard.

An amusing turn was given to the photographing of Mr. Gladstone at the recent Hawarden *fête*. In taking the Grand Old Man alone, the photographer called out, "Not quite so stern, Mr. Gladstone, please!" This request was greeted with loud laughter by the assembled throng, and Mr. Gladstone himself joined in the merriment.

On Saturday, the 4th inst., Mr. Justice Chitty, upon the application of Messrs. Neish & Howell, on behalf of Messrs. Elliott & Fry, of 55, Baker-street, W., and (in another case) upon the application of Messrs. Frith & Co., of Reigate, granted an injunction to restrain W. Goodman & Co., of Liverpool, the agents in England of Messrs. Mast, Crowell, and Kirkpatrick, of Springfield, Ohio, from selling a book styled *Scenes from Every Land*, containing photographic views, some of which were proved to be infringements of certain copyright photographs belonging to the plaintiffs. Mr. Justice Chitty also made an order for the delivery up of all unlawful copies, and directed an inquiry as to the damage sustained by the plaintiffs, to whom the costs of the actions were awarded.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,559.—"Apparatus to be employed in Photographing Developments of Circular or other Surfaces seen from different points of view." A. H. Smith.—*Dated August*, 1894.

No. 15,643.—"Optical Lantern." J. Airs.—*Dated August*, 1894.

No. 15,673.—"Improvements in or relating to Shutters for Photographic Cameras." J. B. Irving.—*Dated August*, 1894.

No. 15,704.—"Improvements in Photographic Cameras." R. Krügener.—*Dated August*, 1894.

PATENTS COMPLETED.

Improved Screen and Printing Surface for Use in Photo-Mechanical Printing Processes.

No. 11,839. Max Levy, No. 1213, Race-street, Philadelphia, Pennsylvania, United States of America.—*July* 21, 1894.

This invention relates to photo-mechanical engraving in half-tone, the object being to provide photo-mechanical half-tone printing surface having a different texture from that produced by the means in current use, and at the same time render more accurate the definitions of the details of the subject and a greater variety of gradations of light and shade.

In all the methods which are at present in use of producing half-tone printing surfaces by means of a lined or cross-lined screen the texture consists of a series of subdivisions of the surface, which, while the individual elements of the series differ from each other, are still geometrically alike; that is, for any particular shade there would be dots, lines, or cross-lines, which have the same geometrical relation to each other whatever their individual character, and the same is true of all the shades.

This invention consists in an improvement, by means of which each subdivision of the printing surface and the resulting texture of the printed impression consists of regularly disposed groups of dots, lines, and stipples, and the individual members of each group are different from each other, but the groups are in their geometrical arrangement similar throughout the series.

In order to carry out my invention it is necessary to have a screen or grating, which will have transparent apertures of different sizes arranged in groups, and also opaque obstructions to the light differing in value from each other and also arranged in groups. These groups may each consist of two, three, four, or more individual members, and the chief condition is that both transparent and opaque members should differ in size from each other.

Such a screen may be formed of lines alternately thick and thin and crossed at, or nearly at, right angles, and in this case one of the sets of lines in each direction must be displaced from the middle of the space formed by the complementary set of lines, so as to form four transparent apertures varying in size, and the intersections of the thinner and thicker lines will form the necessary opaque obstructions, which also vary in size.

Improvements in or in connexon with Photographic Roll-holders or Roll-holder Cameras.

No. 15,878. Henry Cook, M.D., F.R.C.P. London, J.P., &c., Priors Mesne, Lydney, Gloucestershire, and Henry Rex Cook, Fort Elizabeth, Cork, Ireland.—*July* 21, 1894.

This invention relates to photographic apparatus of the character known as roll-holders or roll-holder cameras, or the like, wherein the sensitive film or the like is wound off a roller or spool, and exposed in successive lengths and thereafter wound on to a receiving roller or spool, and our present improvements are designed to provide means for dividing or cutting off successively the length immediately or soon after exposure, so that each exposed length will be cut off at the right point, and can be readily removed from the holder or case when required, without having to wait till the whole length of the roll has been exposed, or (in the alternative as at present) unrolling the length or lengths exposed and cutting off same to remove for development—thus causing considerable trouble and waste of the film in again attaching the end of the film to the winding roller or spool, whereas, according to this invention, the lengths will be cut off without winding on to a receiving roll, or, if desired, a receiving roll may be arranged and mounted in combination with our improvements, so that, when it is not desired to cut off the lengths after each exposure, instead thereof, the film can be wound on to a receiving roll or spool as at present.

Our present invention is as follows :—

In a suitable case, holder, or camera, the roll of sensitive film to be exposed is arranged and mounted in any suitable manner, and the end thereof is drawn over or across the position for exposure, and then passes round a roller or other guide at the edge, and thence the film is led between two (or more) drawing-off rollers (or the film may pass direct to these two rollers, without any intermediate rollers), between which the said film is pressed and gripped, and when these rollers (or one of them) are revolved by means of a key, or milled head, or other suitable device attached thereto, or in connexion therewith, on the exterior of the case or holder, the grip between these rollers must be sufficient to draw off each successive length of film for exposure, and thereafter maintain sufficient hold on the film to keep same tightly stretched for the next exposure. For this purpose, this pair of drawing-off rollers may be formed of any suitable material, or covered with any suitable frictional material and mounted sufficiently close together, and if desired mounted in such a manner as to be capable of adjustment towards one another) to give the required amount of grip and hold on the film, and also thereby allows of the more easy adjustment of film within the guiding surfaces.

The free end of this film coming through this said pair (or more) of drawing-off rollers is now led to a cutting block, guillotine, or knife edge or edges, in more or less close proximity to said rollers, and then the knife is drawn along, or otherwise actuated, or caused to set transversely upon the film, and the exact length required for each exposure is thereby cut off, and curls up and drops in the receptacle or space provided.

This knife or cutter may be of any suitable form, and may be made to give a running cut across the film, and for this purpose is made to travel across the path of the length of the film in any suitable manner ; or the cutting edge may be fixed and extended right across the path of the film, and the film forced on to such edge by a roller, or other device caused to travel across from side to side.

Or the knife may be contained inside one of the drawing-off or other roller, and may be forced out at the right moment or when desired, so as to cut the film, or the knife or cutting device may be otherwise arranged, constructed, and mounted, so as to act in any other equivalent or suitable manner.

For instance, the cutting movement or actuating of the knife or cutting edge may be imparted by hand by a separate movement by the operator of a knob, projection, or handle, on a slide or lever, or other mechanism controlling the knife or cutting device, or, if desired, the actuation of the cutting device may be automatic, that is, may be caused by mechanism in connexion with the aforesaid winding rollers, so that at any moment during the operation of winding off each successive length, or when the same is completed, thereupon the cutting device is mechanically caused to act and a length of film thus cut off, and thus the operator winds off and cuts off a length of film at one operation.

For the sake of example, we will now describe one way of carrying out our invention with an automatic cutting device.

One of the two rollers forming the pair of drawing-off rollers is made of such a size that the circumference thereof is about equal to the length of film used at each exposure, and this roll has the actuating key or handle attached or connected thereto ; also this same roll has affixed at one end thereof a toothed disc or wheel—a small part of the circumference of which is mutilated or cut away—the teeth of this toothed wheel gearing into and driving a second and non-mutilated gear wheel or toothed disc

This second or driven toothed wheel has affixed thereto or actuates a drum or pulley, to which one end of a cord chain or the like is fastened, the other end of this cord &c., being fastened to a cutting device, such as a knife carried on a slide or traveller moving in a guide way (such as grooves, rails, or dovetail channels), so that, on this said second disc and connected drum being revolved, the said cord, &c., will thereby be wound up, and thus draw the knife or cutting device across the path of the film, but out of contact therewith, at the same time winding or straining a spring or springs, the reaction of which tends to pull back the cutting device, and the parts are so arranged that, at the moment when the required length of film has been drawn off, the cutting device has crossed clear of the path of the film, and at the same moment the mutilated or recessed part of the first toothed wheel comes round and coincides with the second toothed wheel, and thereby the latter is left free, and upon such release the aforesaid spring will smartly draw back the cutting device across the film, and in cutting contact therewith, and thereby the exact required length is automatically measured and cut off at the same time.

Any suitable means may be adapted to keep the cutting device out of cutting contact in one direction, and put same in cutting contact in the opposite direction ; for instance, a knife pivoted to the slide, and having the actuating cords attached to said pivoted blade, so that the pull in one direction will move the blade on the pivot out of contact, while the pull in the other direction will force the blade into position to cut as it travels.

By arranging and mounting also an ordinary winding or receiving spool with a measuring roll as usual, when desired the film can be withdrawn from the cutting mechanism and attached to said spool, and wound off in the usual way, while the cutting mechanism would then simply remain idle, or may be thrown out of gear by a suitable device, as by pressing up the aforementioned disc-attached drum, so that it may not engage with the actuating toothed disc.

An Improved Adjustable Limelight Burner for Magic Lanterns and Similar Purposes.

No. 17,701. Alfred Charles Jackson, 82, Farleigh-road, Stoke Newington, London, and Henry Luscombe Toms, 78, Queen Victoria-street, London.—*July* 21, 1894.

Our improvements refer to the mechanical arrangements for holding and adjusting the lime, and to the shape of the lime block.

We construct the lime-holder, which is a flat metal box, in two parts, and connect these at the back by a short plate with a slot working over a pin, and a nut to fasten same. On the inner edge of the rim of the holder we form a projecting lip or bead, and we form the lime blocks with a groove to receive said lip. Behind the holder is a socket to receive the end of the rod, by which it is slowly rotated as the lime is consumed. As this rod lies at an angle from the holder, we insert in it a modified gimball joint, which allows the rotating motion to be communicated from any convenient position behind the holder. The short end of the rod, after leaving the gimball joint, passes through a vertical fork, and is furnished with a fixed disc and a movable disc nut, running on a thread cut on said rod, and so arranged that, by screwing up the disc nut, the holder can be fixed at any desired height on the said vertical fork. When preferred, we adjust the height of the lime-holder on the vertical fork by making the disc nut and disc in one, with a short bar between them, so as to form a sliding guide, which rises and falls freely on the said fork. From this guide there hangs a plate, which rests on an inclined plane attached to a wire rod, so that it can be drawn forward or pressed backward, and will thus elevate or lower the lime-holder.

It is an especial feature of our improved burner that it can be easily detached from the rod when the block of lime is renewed. This is effected by means of a dove-tail joint attachment, or in some other suitable way.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
27	North Middlesex	Demonstration in "Carbon." Birt Acres.
28	Birmingham Photo. Society	
28	Great Britain (Technical)	Limelight Apparatus. Introduced by R. R Beard.
28	Hackney	*The Humorous Side of Photography.* W. F. Fenton-Jones.
28	Halifax Camera Club	
28	Lancaster	
28	Leith	
28	Paisley	
28	Rochester	
28	Warrington	
28	West London	
29	Burnley	
29	Leytonstone	
29	Photographic Club	Open Night.
29	Southport	
30	Glossop Dale	
30	Halifax Photo. Club	
30	Hull	
30	Liverpool Amateur	
30	London and Provincial	Zenotype.
30	Oldham	
31	Cardiff	
31	Croydon Microscopical	
31	Holborn	
31	Maidstone	
31	Swansea	
September.		
1	Hull	
1	Liverpool Amateur	Excursion: Burton, Shotwick, and Puddington. Leader, Dr. Ellis.
1	West London	Excursion: Berkhamsted.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 16,—Mr. W. Cobb in the chair.

Mr. J. Walker was elected a member.

Mr. J. Traill Taylor was thanked for a presentation copy of *The Optics of Photography* for the Association's library.

A New Printing-out Paper.

Mr. A. Cowan showed results on a new emulsion paper of Messrs. Marion & Co., toned with platinum. He drew attention to the difference in tone produced according to the length of time of immersion in the toning bath, and thought there was a good amount of platinum in the prints.

The Chairman passed round specimen prints on emulsion paper of the same kind, toned with gold and sulphocyanide.

Both sets of prints were much admired.

Mr. J. E. Hodd showed a new hand-camera finder consisting of a small black mirror. He said one of its advantages was that it could be used in the brightest light.

Sulphur Toning.

Some discussion on sulphur toning took place, Mr. A. J. Brown quoting Captain Abney's remark as to the stability of sulphide of silver images.

Mr. W. E. Debenham had toned silver stains with sulphide of ammonium, and found them fade in a very short time.

The Chairman said that at one time prints were toned with sulphur, and yet many of them had stood very well.

Mr. Debenham said that the bath used was a mixture of gold and hypo.

Mr. A. L. Henderson was of opinion that the permanence of a sulphur-toned print depended upon whether the print had been fixed before toning or not. If metallic silver only were left in the print, this, if subjected to sulphuretted hydrogen, should not fade. He agreed with Captain Abney on the point. His (Mr. Henderson's) experience was that so-called sulphur-toned prints were more permanent than those toned with gold. He had had that view for thirty years, and also that greater permanence was assured by toning after fixing.

Mr. A. J. Brown had tried this latter method with gelatino-chloride and had not been able to get a respectable result.

Ammonia.

Mr. F. B. Grundy read a paper on this subject, prepared by himself and Mr. A. Haddon [see page 533]. At the conclusion of the paper Mr. Haddon exhibited the specific gravity bulb referred to in the paper, and demonstrated its delicacy as an indicator of the strength of ammonia solutions.

Mr. J. E. Hodd asked whether Messrs. Haddon and Grundy thought that a knowledge of the strength of his ammonia solution was of any real importance to a photographer in successful development. It seemed to him that, if he found he was not getting the usual amount of detail, he would use more stock solution.

Mr. Haddon, in reply, asked how often had plates been blamed when developed at a low temperature, whilst, when developed at a higher, they had been found satisfactory?

Mr. Hodd would develop, as far he could, with a known amount of ammonia, and if he failed, would add, say, five drops more. He did not think a slight chemical fog any objection in a negative. A fixed amount of ammonia was generally allowed for in use.

Mr. Grundy pointed out the importance of knowing the exact strength of the ammonia solution. Referring to the table given in the paper, he said there would be a tremendous difference in the effects given in development by using Nos. 2 and 16. It seemed to him that Mr. Hodd's advice was equivalent to advocating pinches of the fixed carbonates in development when they were used.

Mr. Henderson said that, when using a strong solution on a highly illuminated plate, and the same amount on another plate not so highly illuminated, you could not get the same kind of results, hence he thought it better to feel one's way. Development was a matter of experiment from beginning to end.

After some discussion as to system *versus* non-system in development, Mr. Hodd, referring to Nos. 6 and 13 in the table of results, asked what amount of difference the discrepancy would represent in an ounce of pyro solution.

Mr. Haddon replied, About nine per cent. Referring to a remark of Mr. Brown's, that the use of the bulb enabled one to standardise one's ammonia solution, Mr. Haddon said that we got the quantities of our pyro and bromide by the balance, whereas the amount of our ammonia was unknown. Referring to Mr. Hodd's first remarks, he said every one began development in a tentative way. For example, on plates exposed in the field one would not pour on all the developer at once, whereas for studio work, where one's exposures were known, the full strength could at once be applied. It was certainly an advantage to be able to dilute down or increase the strength of one's ammonia. The bulb was tested for a temperature of 20° C. = 68° F. That temperature was chosen because it was easier to warm water in winter than to cool it in summer. Replying to a remark of Mr. Hodd's as to rubber caps over the stoppers of ammonia bottles getting blown out, Mr. Haddon said that this was proof of the ammonia gas penetrating the rubber.

Mr. J. S. Teape could quite see the advantage of some means of testing and knowing the quality of the ammonia we were using. He once found a difficulty in getting all detail out of a plate with the full amount of ammonia, and with the addition of one drop he obtained dense fog. If he had known the quality of the ammonia, he would not have added it.

Replying to a vote of thanks passed to Mr. Grundy and himself, Mr. Haddon said that all the formulæ containing ammonia were absolute nonsense, and the sooner it was taken into consideration that ammonia ·880 was not made the better.

Photographic Club.

August 15,—Mr. L. J. Montefiore in the chair.

Mr. J. A. Sinclair asked if any member had been troubled by the common house fly eating the surface of partially dry negatives.

Mr. Foxlee said that beetles would tackle negatives and carbon tissue even after sensitising, but he had not seen any effects as related by Mr. Sinclair.

Mr. Bridge said he had something new in the way of spots to show on some plates recently exposed in Norway. The plates were developed with pyro-ammonia; others of the same brand, but developed with pyro-soda, showed no signs of these spots.

Mr. R. P. Drage showed some stretched films of French make. These were apparently a sheet of gelatine stretched on a metal frame, and, when dry, hand-coated from the other side with emulsion. The result was a perfectly flat surface after exposure.

Leytonstone Camera Club.—On Saturday last the members of this Club had a down-river excursion from Old Swan Pier to Greenwich, under the leadership of Mr. A. C. J. Frost. The weather generally was very dull, but some fine effects were occasionally seen as the sun shone through the heavy mists, giving a very picturesque effect to the many barges going out on the tide. On Saturday next the Club intends visiting Rainham, under the leadership of Mr. W. E. Hall. The members will proceed from Fenchurch-street Station by the half-past two train.

North Middlesex Photographic Society.—August 13.—Mr. S. Herbert Fry gave a demonstration on *Developing Gelatino-chloride Papers*, which had been held over by reason of his recent illness. The prints had sufficient exposure to just render the image slightly visible, and were then placed in the bromising solution, potassium bromide one ounce, water ten ounces. He laid great stress upon the necessity of thoroughly bromising, and kept them in the solution about a quarter of an hour. The prints were then thoroughly washed, and were then ready for development, the developer being composed thus:—Solution I.—Hydroquinone, ½ ounce; sulphurous acid ¼ ounce; sodium sulphite, ½ ounce; potassium bromide, 60 grains; water to 25 ounces. Solution II.—Caustic soda, ¼ ounce; sodium sulphite, ½ ounce; water to 25 ounces. Solution III.—Bromide of ammonium, 1 ounce; carbonate of ammonium, 1 ounce; distilled water to 25 ounces. Take equal parts of each. Development should be stopped when the details in the high lights begin to show, as the image rather gains than loses subsequently. Then wash thoroughly and at once to get rid of the developer. The prints are then ready to tone by any of the usual toning baths. The prints leave the developer a brick-red colour, and readily tone to any colour desired. Much interest was manifested in this simple method of getting prints on ordinary print out-paper with a minimum exposure, and it was felt that a great power of printing in dull weather was placed in the hands of photographers.

Forthcoming Exhibitions.

1894.		
August 28	.....	Royal Cornwall Polytechnic Society. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., and Edward Kitto, F.R.Met.S., The Observatory, Falmouth.
Sept. 11–Oct. 6	.....	Royal Aquarium.
,, 17–21	.....	Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14	...	Royal Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	.....	Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	.....	East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	.....	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 20–22	.....	Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 23–Dec. 1		Stanley Show (Photographic Section).
December	.....	South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

Platinotype and Bromide in Small Sizes.

To the Editor.

Sir,—When will manufacturers awake to the fact that as (as far as I am aware) neither platinum nor bromide paper is sold in *carte-de-visite* or cabinet sizes. The present system of packing simply the sizes of plates could be supplemented by the ever-popular cabinet or *carte-de-visite*, the same as the gelatine papers are with advantage, for at present, if the photographer wants, say, cabinet-size platinotypes, he has either to waste the surplus of a half-plate piece, or buy three whole sheets, which is sometimes not convenient to the small worker in platinum and bromide.—I am, yours, &c., Othello.

Buckfastleigh, August 21, 1894.

A Vertical Camera Stand.

To the Editor.

Sir,—Old photographers will recollect, about thirty-five years ago, an ingenious maker of photographic apparatus named Francis, in Great Russell-street, Bloomsbury, who made a studio camera stand, having the means of placing the camera vertical, or in almost any position. I have one now, and have found it a most useful piece of apparatus.

As a copying stand and for the lantern it is most efficient, being very firm and impossible to slip or be pushed over.

The stand is cast iron, has a firm base on three legs; the camera can be raised, depressed, or turned in any direction by simple movements, and held firm by screws.

The head of the stand is hinged at one end to a rigid base, and opens like the leaves of a book, has a segment of a circle passing through a slot which allows the camera to be clamped rigid in any direction, vertical included, the stand has a tube and socket for raising, lowering, or turning in any direction without moving the base. For home use I have never seen anything more useful, and, if the patterns are in any one's hands, it would pay to reproduce.

I enclose you a print of loose objects done by its aid.—I am, yours, &c., Frank Howard.

Camera Club, August 20, 1894.

A Mysterious Negative.

To the Editor.

Sir,—Under the above heading in your issue of the 17th inst., I notice a letter from W. R. Bland and the editorial footnote asking whether any of your readers have had a similar experience, *i.e.*, of something entirely different from what was expected appearing on the plate after development.

Well, as near as I can recollect, it will be about a year ago that a friend of mine, a professional photographer, exposed an Ilford ordinary plate upon a group, and upon development there appeared the group sure enough, but besides that there also appeared a regular geometrical figure of a distinct floral pattern covering two-thirds of the plate. The figure was more like a Japanese parasol than anything else I can think of. Of this I am certain, there was nothing in my friend's house like it either in shape or pattern; besides which, the plate-box was opened in the dark room, wherein hundreds of other plate boxes had been opened without any mishap. In fact, the plate received precisely the same care and attention that is usually bestowed upon plates by those who have to take groups away from home.

In conclusion, I may as well state that my friend and I decided to send the plate back to the makers in order to prevent any accident in the future. The answer we got was that the plate was all right when it left the works, &c., and also that it had had a previous exposure. Of course, we knew there had been a previous exposure, but what puzzled us was the *when and where*. Any how, the Ilford people were sure they were not to blame, and we were equally sure we were not, so there the matter ended.—I am, yours, &c., H. Lambert.

Stratford.

To the Editor.

Sir,—Possibly the mysterious effect, and also other supernatural appearances on negatives that we hear of occasionally may be the relics of former negatives, *the glasses having been cleaned off and used again.* I have often had the effect in the old wet-plate days, when the practice was common.—I am, yours, &c., F. E. Jones.

Belle Vue Studio, Cinderford, Gloucestershire.

COLOUR PHOTOGRAPHY.

To the Editor.

Sir,—Referring to what Mr. Dunmore says on page 504, it may interest him to know that in 1888 Mr. Ives used coloured prints on gelatine to produce pictures in colour; and as late as 1890 he, before the Franklin Institute, recommended that coloured lantern slides should be made by the Woodburytype method, the films being coloured and superposed.

As Mr. Ives now uses an entirely different method, one very similar to that used by the late Mr. Scott of Weston-supra-Mare, it would be interesting to know who was the first to use separate coloured transparencies in the lantern by which the composite colour effects were obtained. If I remember correctly, Mr. Ives now claims that he introduced what may be called Scott's method.

In the interest of the history of Photography it would be as well if this matter could be set at rest now, as in a few years there may be the doubt as at present exists as to the originators of other photographic methods.—I am, yours, &c., A. Brothers.

Manchester, August 20, 1894.

"IMITATION CERAMIC PHOTOGRAPHS."

To the Editor.

Sir,—Your correspondent, Mr. Holman, is too hasty; if he will reperuse the article which appeared in your issue of August 3, he will find that "glass, porcelain, metal" (enamelled?), all of which are liable to "chip" or "crack," are advocated for the production of imitation ceramic photographs. Can Mr. Holman name any base of suitable colour for photographs, which will not "chip" or "crack," and will withstand temperature of 200° for hours?

Mr. Holman asserts that a varnished photograph is imperishable. In reply, allow us to quote a passage from the works of the Head Master of the Kensington Art School, which says,—

"Coins rust with time; statues of marble and bronze crumble or are corroded; inscriptions are obliterated: stone walls fall to the earth, and the pyramids themselves are slowly disappearing. Every monument that mankind have thought most lasting yields to time, except the ware of the potter."

We venture to say that our photo-keramics are good specimens of the potters' ware.—We are, yours, &c.,

The Midland Photo-Keramic Company.

Nottingham, August 21, 1894.

PROFESSIONAL AND AMATEUR GRIEVANCES.

To the Editor.

Sir,—The grievance of the country professional—that the amateur was robbing him of his trade, by doing work for nothing, or receiving payment for it, work which otherwise would have gone to him—has been talked of over and over again, and there never can be any settlement. An amateur has a perfect right to turn professional and to give it up, and to start again just whenever he pleases; and the professional has as good a right to buy and sell old clothes, umbrellas, diamond rings, or equatorial telescopes, or anything else he choses to make money on.

The exhibition and competition grievance, either of the amateur or professional, is a tinpot affair; there is no compulsion to go into either of these, and because somebody has more ability, or better apparatus, or more time and money than somebody else, are they to be excluded? The whole thing is too ridiculous, and the grievance more imaginary than real. But now another grievance has turned upon the plate-makers and dealers. An association of professional photographers has been formed to protect their interests, but everybody who has had even a very little experience amongst professional photographers knows very well that a society of them could not hold together. There is too great a disparity in both their business and social positions, and any attempt at union must end in failure, and it would be just the same with photographic dealers.

Some professionals ask why they cannot have better terms than are given to amateurs; but who are the professionals who ask such questions? They must be awfully green! If a dealer goes to a dealer for two, or three, or six dozen plates from a dealer's stock, why should the dealer share his profit, which is little enough after paying carriage and packing?

When I want a stick of shaving soap, I go to a chemist and pay a shilling for it; but, if I wanted a gross of sticks of shaving soap, I would not pay seven pounds four shillings for them; and just so with the professional who goes to a respectable dealer for a gross or two of this, and a gross or two of that, and a dozen or two of so-and-so; he has not much to complain about terms—there is plenty of trade competition amongst dealers, and what one won't do another will.—I am, yours, &c.,

Manchester, August 21, 1894. W. I. Chadwick.

PHOTOGRAPHERS AND THE ILLUSTRATED PRESS.

To the Editor.

Sir,—I have read with interest the letter from Mr. Gibbons, of the *Lady's Pictorial*, in your this week's issue, and I quite agree with part of what he says.

If, however, Mr. Gibbons contends that, in *all cases* where the sitter sends him a photograph for reproduction, he should not be called upon by the photographer for the payment of a fee, simply because it is sent by the sitter, I cannot agree with him, for the reason that, if the photograph is the copyright of the photographer, the sitter has no voice in the matter, and a fee should be charged. But, on the other hand, I have always been of opinion that for a photographer to demand a fee for the reproduction of a photograph which he has been paid for at the time of sitting is not only wrong, but positively dishonest. Also, I advocate mounting copyright pictures on mounts bearing conspicuously the word "copyright" (although such is not required by the Act), and I never lose an opportunity of pointing out my views to my brother photographers on these matters, as witness the last paragraphs of my little pamphlet on *Photographic Copyright*.—I am, yours, &c., Joseph J. Elliott.

55, *Baker-street, August* 22, 1894.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office either on Wednesdays from* 4 *to* 6, *or Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. W. Beaufort.—We shall be pleased to see the article you refer to.

Pop.—Yes, a pair of rectilinear lenses of the focus named—five and a quarter inches—will be found perhaps the best for all-round use.

J. H. W.—We do not think that metol is soluble to the extent suggested. Better employ one of the formulæ as given at pages 865–6 of the ALMANAC for 1894.

A. M.—Your interesting communication has been published. The address you require is Charles F. Robinson, the Carlotype Company, Rainham, Essex.

J. H. GERMAN.—We have not heard of such cases as yours. If the firm admit that the paper was bad, it seems strange that they will not replace or allow for it.

ARTHUR SPENCER.—If you wish to remove the yellow stain produced by the pyro developer specified, employ one of the two clearing solutions given on p. 886 of the ALMANAC for 1894.

P. SCHMIDT.—1. Possibly your best plan would be to obtain a situation with a professional photographer as an improver. 2. By all means join a photographic society; you would be perfectly eligible for membership.

C. BRAND.—We should think such a form would meet the case. Consult the Secretary of the Photographers' Copyright Union, London Chamber of Commerce, Botolph House, E.C., if you have any further doubt on the matter.

ARCHER & SONS.—There cannot be any patent for the interposition of a loose plain-glass in front of a lantern condenser, as this has been in use, or at any rate has been well known, for many years. See our ALMANAC for 1877, page 30.

P. O. P.—You cannot do better than keep to the separate baths recommended by the makers. The paper will, doubtless, tone in the "combined" bath; but, if stability of results be a consideration, use separate baths, as the makers say.

ROSE & CO.—Yes, you can still register the photographs, a course that will be necessary before you are in a position to take proceedings. You will probably not recover as great damages as if the photographs had been registered before the "copyright" was infringed.

S. W. R. (York).—If the plates will not bear prolonged development with pyro-ammonia without staining, and they are all under-exposed, try the effect of employing pyro.soda developer, as you have such a prejudice against the new developing agents, which, by the way, is quite unfounded.

T. WILSON.—The cause of the hazy appearance in the picture is that the sun was shining on the lens when it was taken. The direction of the shadows shows that the sun was almost directly at the back of the buildings at the time the exposure was made. A similar effect would have been obtained on any make of plate.

S. CLEWSON.—For collotype plates, tolerably thick plate glass should be used. If a scraper press or a roller press be employed in the printing, thinner plates are generally thought necessary than when a press with vertical pressure is used. It is not necessary to round or bevel the edges of the glass unless the printing is done in a machine; then it is.

C. C. C.—If the gelatino-chloride prints are so tender when they leave the toning bath that the surface cannot be touched without its becoming marked, they should be treated with an alum solution before fixing. But the alum should be well washed out before they are immersed in the hypo-sulphite solution, if the permanence of the pictures is of importance.

NOVICIATE.—The usual method of making reversed transparencies for the so-called "Talbot Klic" method of photogravure is by the carbon process. But a suitable transparency is all that is required, and, if it can be obtained as well by one method as good as by another, what matters? Those houses that turn out the best work abroad, we know, use carbon transparencies in the etching method.

J. HARRIS.—The collodion you have made has behaved in precisely the same way as much that we have ourselves made, and you need not be afraid to use it. If, after a trial, you find that it does not give a clear bright image, you may dissolve in it a small particle of pure iodine, or may add to it a few drops of an alcoholic tincture of iodine (a solution of iodine in alcohol), by which a sherry colour will be imparted to the collodion.

H. NICHOLSON asks: "Can you tell me the cause of enclosed print becoming discoloured? It is Eastman's paper and combined toning and fixing solution and mounted with gloy. I should be greatly obliged if you could suggest cause of failure."—Try toning and fixing in separate baths, and mounting with starch paste. As we do not know the actual constituents of gloy, we cannot offer an opinion as to the effect it may have had on the print. The discolouration appears to be due to sulphuration or fading.

PRINTER (Shaftesbury) says: "I enclose a photograph. You will see from it that I have spotted the button black, but in burnishing it rubs off and smears. I spot with spotting medium and albumen. I take the white of an egg and shake well up in a bottle till it froths, then use it. Very small spots retain the spotting, any larger I rub. Can you tell me any remedy or anything that will stand. I let them stand about three-quarters of an hour before burnishing? Also, in burnishing, when the roll gets a little warm, the cards stick and require pulling through. This marks the back of the card. Can you tell me anything to make the cards go through without stopping or sliding, as it were, in the middle of the card?"—Our correspondent has apparently omitted to lubricate the prints before burnishing them. They should be rubbed over with a solution of Castille soap in alcohol, a few grains per ounce. They will then not stick to the burnisher, and the spotting will not come off if it is perfectly dry before passing through the machine.

SIDNEY SUSSEX asks: "1. Can photographs in colours be produced sufficien perfect to be used with John Anderton's lantern stereoscope with success If so, from what source can information as regards the making of them be obtained, mentioning works? 2. Are there any works on micro-stereography? If so, please mention same. 3. What is the difference betwee the Ives and Lippmann system of producing colour photographs? 4. Is there any superiority of the several processes for producing lantern slides over the ordinary commercial plates for same?"—In reply: 1. If you allude to the Ives method, we should say that it is not available for stereoscopic projection by Mr. Anderton's system. The slides must be coloured by hand. 2. There is an illustrated article on this subject in the ALMANAC for 1894, which gives all available information. 3. Briefly, one reproduces the hues of the original by photographing its (three) colour sensations, the other (Lippmann's) by iridescence, *à la* soap bubble. But we cannot pretend to give you a complete idea in this column. See Mr. Wall's paper in recent numbers of the JOURNAL, of which, you must pardon us saying, you do not seem an attentive reader; also our volumes for 1890, 1891, 1892, 1893, where both processes are fully set forth in detail. 4. Commercial lantern-slide makers invariably employ the wet-plate process.

F. W. PICKFORD writes:—"I shall esteem it a great favour if you can give me any information *re* the following, through the medium of 'Answers to Correspondents' in the JOURNAL. I have to repair a strongly painted three-quarter figure oil painting, which is peeling off the canvas as small piece enclosed. The picture was painted May, 1876, and has every appearance of being painted on some photographic basis. The canvas is painted in oil on back, and ordinary prepared on front. The film or painting does not crack like an oil painting, but seems to blister and come clean away with the preparation on canvas. I do not know if I have made this clear to you, but hope so. The information I should like is, What is the oil colour painted on, and how is the best method of stopping further peeling? The picture is five feet by four feet."—Without knowing upon what photographic base the picture is coloured, and this we cannot form an opinion upon from the piece enclosed, as it is thoroughly permeated by the paint, it is impossible to say what is best to be done. As the painter's address is known, better inquire of him what the basis. We may then be able to advise.

PATIENS says:—"Having recently purchased a packet of Nikko paper for trial, I endeavoured to develop the prints with amidol, as ferrous oxalate is very inconvenient for amateurs with limited time and space. I followed the instructions given by Mr. Dresser in the ALMANAC for bromide prints—six grains of amidol to each ounce of saturated solution sodium sulphate. The first print developed was fairly good and clear, but the second and all succeeding prints were stained green, yellow, and brown. I have tried on several occasions, but always with the same result. The first print is right, the others stained almost beyond recognition. On the last occasion the developer was prepared the day before, and carefully filtered each time. Please point out where I have erred. Amidol is given as one of the developers which may be used for Nikko, but no directions as to how it should be used. Is it necessary to have fresh developer for each print?"—We cannot account for the behaviour of the developing solution in the way described by our correspondent. We have developed Nikko paper with amidol, always with success. It is not necessary to have fresh solution with each print. Our correspondent does not say whether his solution undergoes discolouration, which might account for the staining of the prints.

G. B., SENR., writes as follows: "Knowing your kindness in answering inquiries as to any matter in connexion with the trade, I would take it as a great favour if you could guide me in the following inquiry:—If a photographer fails in business, and the intention is to sell him off, can he forbid them selling the negatives to Tom, Dick, or Harry, seing the negatives were left in his custody and taken by him, also seeing he is willing to take charge of them, at same time having received instructions from the customers they are not to be sold, but retained by him? The photographer has forbidden these to be sold, but is willing to break certain lots, and to pick out what he considers might be wanted and risk keeping same. While the photographer is willing that the business should be sold in working order, he still objects to the negatives going with it. The query is, how does the Copyright Act affect this? The point is at present troubling a number of parties. Of course, if the photographer had been selling his business along with a promise not to start within a certain number of years, this would be, I think, different."—It seems to us that in case of failure the negatives as well as the business and all other property become the property of the creditors, and can be disposed of by them in the ordinary way. The copyright, if there is any, is vested in the author of the work, but probably it has not been registered by him, and is of little or no value if it has been. It is certainly unpleasant for the sitters to have the negatives of themselves disposed of to "Dick, Tom, or Harry," but it is done every time the good-will of a business is sold voluntarily. Where, then, is the difference when it is sold under compulsion?

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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FAULTY VIGNETTING AND THE REMEDY.

Some five years ago, when writing about the then new work by Dr. Emerson, *Naturalistic Photography*, we spoke of the very far from uncertain sound of his utterances concerning the vignetting of photographic portraits, quoting his remark that "whoever introduced the practice of vignetting was no artist," and that "the dodge was evolved from a misconception of the aims of art," and more to like purport. We ourselves took occasion to say that, comparing some steel-engraving vignettes with many photographic vignettes in our possession, the latter, with but few exceptions, were "vile atrocities" so far as their vignetting was concerned.

Five years have passed since then, and things in this respect have in some measure improved, but we occasionally meet with some that are worthy of the strongest condemnation, some qualified to make an artist shudder. A sitter is placed against a dark background, the negative is taken, and is printed through a vignetting glass, or a piece of opaque paper or card with an aperture cut therein, this being placed so close to the negative as to cause the finished print to present the appearance of a dark oval on a white surrounding, a head being made of the oval. This is *not* vignetting. A blurred line of demarcation between the figure, a bit of its often dark background, and a pure white surrounding, is not a vignette, and the sooner this sort of thing is relegated to the limbo of the past the better will it be for the art.

We should much like if these condemnatory remarks could have been confined to the work of the lower stratum of photographers, but are sorry to find that the fault indicated is occasionally to be found in otherwise highly finished and worked-up enlargements.

A photographer has written to us complaining that he cannot get his printer to produce vignettes similar to those issued by another whom he names, and, if perchance one or two out of a dozen are passable, the others are not so. We shall describe the means we have recommended to some others, who at one time experienced the same difficulty. It consists, in a word, in preparing the negative for printing vignettes previous to sending it up to the printing room. The advantages of the system now to be described are, that the negative can be placed in the hands of any one to be printed as if it was to be an ordinary printed-out-to-the-edge proof, that every print will be alike, that the effects can be controlled or determined by the master previous to the printing, and that at any subsequent period the negative can almost in a moment be restored to the *statu quo* for the production of plain prints.

First of all, the negative should be taken with a graduated background, having the upper part light and the lower part not too dark, and capable of being raised or lowered. After being retouched and varnished, a cake or pan of moist, burnt sienna is obtained from the artists' colourman. If in the pan, the pigment needs no further preparation; but, if in cake form, add a little glycerine to the water in which it is to be rubbed down. With this, commencing about the shoulders of the figure, apply a thin coating, of course on the back of the negative, and before it has time to dry dab it evenly with the point of the middle finger, much in the same way as lantern transparency painters used of yore to bring their skies into smooth uniformity. It is not at all a difficult matter to do this dabbing so delicately as to render it difficult to say precisely at what point the colouring begins. In proportion as the part of the figure that is to be merged into whiteness is approached, so must the thickness of the pigment be increased, this being effected by the obvious means of another application of the pigment accompanied by dabbing as before, and breathing on the surface to keep the paint slightly moist; for, notwithstanding the presence of the glycerine, it will be found to dry rather quickly.

If the background has been light behind the head of the figure, it will require but little work to merge the tint thus obtained in the negative into perfect opacity, for, of course, all the margin of the negative must be opaque in order to ensure corresponding whiteness in that of the print.

We have recommended the employment of the finger point for spreading the pigment evenly; but, should this cause a too coarse granulation, the employment of a kid-glove finger as a dabber will ensure the requisite smoothness.

Provided that too much glycerine has not been mixed with the colour, it dries quickly and hard, and a proof may be obtained in the printing frame immediately the negative passes out of the hands of the vignetting artist.

It need scarcely be said that taste must be displayed in even this simple bit of art work, and it would be well if a few of the choicest specimens of vignetting art were kept at hand to serve for guides as to what to do and what effect to aim at. When more than a dozen or so of prints are wanted, it is desirable to protect the pigmented back of the negative by a coat of varnish, the best for this purpose being a benzole one, containing enough ether to cause it to dry matt or with a ground-glass surface.

"COMBINED" TONING BATHS.

THE permanency, or otherwise, of prints toned in the compound toning and fixing bath, has been a fruitful topic for discussion at several meetings of Societies of late; but, in the result, the matter rests just where it did. Those who entertained opposite opinions hold them still, and it may well be said that each side is warranted in still holding them, so far as actual proofs are concerned. Prints there are in thousands that were toned and fixed in one solution, more than forty years ago, that still show little or no signs of deterioration. On the other hand, there are tens of thousands that have long since passed into the sere and yellow stage. It was the continual fading of the pictures, and the system of combined toning and fixing being pronounced wrong in principle, that led to its abandonment and separate toning and fixing being adopted.

When any old prints that were made prior to the "sixties" are met with, in whatever condition they may be, it can fairly be assumed that they were toned and fixed in the compound bath, for it was not till late in the "fifties" that the alkaline method was introduced, and then it was not generally adopted by professional photographers until some few years afterwards. There were reasons for that not at all dissimilar from those that obtain with some persons now with regard to separate toning and fixing. One was, that good tones were more easily obtained and with less trouble in the old way; also, in the new way, satisfactory tones could not be secured on some kinds of paper as then made.

Some persons who now advocate toning and fixing in a single operation often refer to the prints of old that have withstood the test of time as being made in that way. But the majority of them—those whose knowledge of photography is of recent date—are quite unaware that the conditions under which they were produced were widely different from those that exist in the modern system of procedure. In the latter the sensitive silver salts, as an emulsion, are applied to the paper, and in only about sufficient quantity to form the picture, and with very little free nitrate of silver, the silver salts being confined almost entirely to the gelatine on the surface of the paper.

Now, let us look back at the paper that was employed when the old bath ruled supreme. Then the paper was first "salted" with a chloride, and the chloride of silver formed, by double decomposition, by floating it on a solution of nitrate of silver, as in the case of albumen paper now. The paper, whether plain or albumenised, was very highly salted as compared with the papers of the present time. Furthermore, when albumen was used, it was largely diluted with water, generally with an equal part. The paper was sensitised on a very strong silver bath—from sixty to a hundred, sometimes more, grains to the ounce of water, several minutes floating being allowed. From this it will be seen that the chloride of silver was in the body of the paper instead of being, as in modern papers, confined almost entirely to the surface; also, that there was always a very large proportion of free nitrate of silver present.

The negatives then in vogue were the old pyro-developed ones, which were exceedingly dense in the lights, with clear glass for the shadows, and took a very long time to print. Consequently, when printed, the image was strongly bronzed in the shadows, and was in the body of the paper itself, and could often be seen at the back, instead of being, as now, almost entirely confined to the gelatine coating. In fact, the image was hen composed of a very large body of reduced silver, instead of being, as now, an extremely attenuated one. Hence it will be seen that the paper used in the days of the old combined toning and fixing bath was quite a different thing from that used with the modern one.

We will now consider the difference between the modern combined bath and the old one, and we shall find it to be as great as with the paper. The old bath was very strong in hyposulphite, and contained neither alum, acetate of lead, nor other materials sometimes recommended. It consisted only of hyposulphite of soda and chloride of gold, with, sometimes, a little nitrate of silver. Here is the formula given in Hardwich's *Photographic Chemistry*, third edition (1856):—

Hyposulphite of soda	4 ounces.
Water	8 „
Chloride of gold	4 grains.
Nitrate of silver	16 „

The solution was not used at once, but was allowed to stand for a day or so for the small quantity of sulphur, liberated by the reaction, to subside. The toning was what would now be termed a slow operation. It took from about twenty minutes to, sometimes, several hours, so that there was never any question about the prints being completely fixed before the requisite tone was obtained, as appears to be the case now if warm tones only are wanted. The bath, by the formula quoted, was weaker than that used by many professionals; although considered too weak by them, it will be seen that it contained ten ounces of hypo to each pint of water, whereas the one that seems to be a favourite now contains, after the alum reaction, less than an ounce of hyposulphite to the pint.

We express in the present article no opinion whatever on the merits, as regards stability of the results, of the modern combined bath, but merely point out that any deductions drawn, one way or the other, from the working of the old system of combined toning and fixing must not be taken as applying to the modern method.

AMMONIA.

THOSE of our readers who still employ ammonia in development will be specially interested in the paper by Messrs. Haddon and Grundy, published in our last issue, containing as it does much valuable information on the subject. Most photographers are aware that the solution of ammonia of the shops varies very considerably in strength owing to its volatility, but few probably would suspect such wide differences as those revealed in the paper referred to, and still fewer are in a position to ascertain the real strength for themselves.

Notwithstanding the introduction of so many new developers possessing qualities which recommend them in preference to pyro, there are still a very large number of photographers who still adhere to the latter, and probably with reason, as the best all-round developer, suitable for every purpose. But it is only when employed in conjunction with ammonia that its full powers are secured, for, when used with the alkaline carbonates, it possesses no advantages over the newer developers, if even it equals some of them. It is an almost every-day occurrence, in discussing the respective merits of various developers, to hear an "old hand" assert that he has found nothing to beat "pyro and ammonia;"

while the novice sticks to pyro and soda, because it is easier to work, and gives density—the principal aim—more readily.

Whether ammonia would prove, on careful and thorough trial, to exhibit the same superiority in action over the fixed alkalies when used in conjunction with the newer developers, it is impossible to say, and, as matters stand at present, the question does not seem a serious one. So far as metol is concerned, we have tried ammonia, and find it to give an image of the finest possible character, and probably, other things being equal, superior to that produced by the fixed alkalies; but, for practical purposes, we prefer to use the latter, because with metol, as with others of the newer developers, no doubt, there is not sufficient difference in action to make it worth while to overlook certain undoubted conveniences of the fixed alkalies.

Messrs. Haddon and Grundy suggest, in the course of their paper, that the disrepute into which ammonia has fallen is probably due to its variable character, but we can scarcely agree with this view altogether. Even admitting the widest variations in strength shown in the table published last week, the difference would not be sufficient to injuriously affect development when carried out in the old-fashioned manner, when the operator knew what he was doing, and suited his developer to the requirements of the plate and exposure. Under the automatic system in general use at the present time, such variations in strength would, of course, prove fatal, and, in fact, pyro and ammonia development would be of no more use in the hands of many modern photographers than a grand piano to an Italian organ-grinder.

So far as the mere variation in strength is concerned, in equally careless hands carbonate of potash, owing to its extreme deliquescence, would probably lead to as great uncertainty as ammonia, while the fact that carbonate of soda gives off some of its water of crystallisation on exposure to the atmosphere removes it from the category of "fixed" salts in the strictest sense of the term. The same objections may be raised against sodium and potassium hydrates, which quickly change their character by absorption of carbonic acid. So that, on the whole, it does not seem probable that the mere variability of character has had much to do with the substitution of the fixed alkalies for ammonia.

The real reason may more likely be traced to the now almost universal practice of using the same solution for repeated developments—a thing unheard of in the old pyro-ammonia days. Then there was not only the volatility of the ammonia to reckon with, but also the rapid discolouration of the pyro, even in the presence of sulphite of soda, and repeated development with the same solution was a practical impossibility. Not so with the newer developers; but obviously, if these were used in conjunction with ammonia, it would be utterly impossible to work with any uniformity or certainty, owing to the rapid volatilisation of the alkali. To attempt to estimate in any way the loss of energy in this manner, and to compensate for it by fresh additions of ammonia, would be equally futile; hence, no doubt, one of the chief reasons why ammonia has fallen into disuse.

Where, however, it is still employed, there is, no doubt, room for the same simple plan or method such as that mentioned by Messrs. Haddon and Grundy, namely, the use of a little specific gravity bulb. An ordinary hydrometer would answer equally well, but, besides being more costly and cumbersome, would scarcely be available for small quantities of solution, such as are frequently made in the more concentrated form, whereas the tiny bulb is equally available for large or small quantities.

But, as we judge from the paper, the bulbs are only made for one strength of solution, namely, a one in ten, or ten per cent. mixture of the ammonia solution of the shops. Until the publication of the paper, we had always been under the impression that, in speaking of a "ten per cent." solution of ammonia, a solution containing ten per cent. of the gas was intended, which, of course, is a very different thing from ten per cent. of the solution. Practically the strongest liquor ammonia of the shops contains one-third, or about that, of its weight of real ammonia; a ten per cent. mixture of that solution with water, therefore, contains only about three per cent. of NH_3.

On looking over the formulæ of the various plate-makers, we find that several of them give a stock solution of ammonia that is practically identical with that mentioned by Messrs. Haddon and Grundy, namely, two and a quarter ounces of ammonia made up to twenty ounces with water. Two at least, on the other hand (Wratten's and Rouch's formulæ), give a ten per cent. solution of the gas, or a mixture of one part of ammoniæ with two parts of water.

In an editorial article in the ALMANAC for 1885 it was shown that one volume of ammonia of the specific gravity of ·885 diluted with two volumes of water constituted a solution a little stronger than ten per cent. (10·65), the specific gravity of the mixture being ·958 at 16° C. A weaker ammonia of sp. gr. ·898 diluted in the same manner forms an almost exact ten per cent. solution of NH_3, which seems to us a more convenient basis of calculation than the other.

We have often pointed out in these columns that ammonia solution deteriorates less rapidly in a weak than in the concentrated condition, and we have advocated the dilution of the strong ammonia as soon as it is obtained from the chemists. Now, we would suggest that photographic dealers and chemists should supply a definite article in the form of a ten per cent. solution of the gas, in which form it would not only keep, but also be strong enough as a stock solution for all purposes. More important than all, such a mixture when introduced into a formula would convey a more definite meaning than so many parts of a solution of another solution.

ARE PLATINUM RESIDUES WORTH COLLECTING?

THIS question was asked at a Society meeting some little time ago, and the only response was one to the effect that saving residues was not worth the trouble. We are not aware of any published data upon the subject, though so long established is the method of platinum printing, and so large the amount of metal consumed by photographers, that it is somewhat singular that more attention should not be given to the subject. The Company's representatives have in times past given details of the method to be pursued to save waste, but, as the instructions in book form which they now issue contain no reference to the matter, it might be supposed that they also do not think it worth while. It is obvious that, if any workers would come forward who have any positive experience to narrate, it would be a distinct gain, as, though platinum work has perhaps not been subjected to the "cutting" that is so bitterly complained of with regard to the older methods of printing, it cannot be doubted that there would be gain all round if it could be plausibly shown that there really was something to be got out of the solutions, or from old prints, or both to-

gether. The subject is one we hold very strong views upon, for the amount of waste that takes place in the average studio is appalling. Thus there are, it is true, very few who do not save their silver from their print-washing water; but, as to hypo-saving, it is most exceptional to see it put into execution, though we have so often pointed out that there is more silver to be so obtained than out of print-washing. However, not to wander from the topic under immediate attention, we are pleased to be able to throw some light upon the platinum-residue collecting, and to show that it is worth while taking the trouble.

A well-known contributor to our pages has just put us in possession of some facts which help the elucidation of the problem. He informs us that, for many years, he had collected his waste-oxalate developing solution in certain large jars, and that, when these were full, his printer used to empty the waste solution into a large flat tray, from which the water evaporated each time a batch of solution was poured in, and so a crystalline mass accumulated, till it weighed, when collected, about fourteen pounds. Unfortunately for the jars of solution, they were cleaned out some time, he did not know when, but he imagines by the same busy errand boy who, when two hypo vats—rich in a black deposit of silver, several months' accumulation—were put out of doors ready to collect, emptied the "dirt" into the gutter, and swilled the vats clean! Be that as it may, the mass of oxalate crystals remained.

Without taking any trouble with it, he sent it to the refiners, Messrs. Johnson, Matthey, & Co., who are closely connected with the platinum interest, asking if they would kindly find out how much platinum, if any, the mass contained. After a lapse of time they wrote to the effect that the mass contained platinum, and that, after their charge for their labour in extracting it, a balance of seven shillings remained in his favour. A further letter to the refiners received a courteous response, in which the owner of the crystals was informed that the residues contained about four ounces of platinum to the hundredweight. We are informed that he did not work his developing baths very closely, but, whenever one became dirty, he put it aside and made up a fresh solution, not employing any of the old for the purpose, hence any one who used his old baths for a long time, as recommended by Mr. Hollyer, in his recent paper, would have a far richer material to work upon for collecting from.

Here we have, from so much platinum paper as would be printed by the time fourteen pounds, or thereabouts, of oxalate had been used up, a sum of seven shillings—not a large sum, it is true, but still one of the many small, the aggregate of which in some businesses is alone looked to for furnishing a profit. But there is another aspect of the question. This collection involved no trouble. The waste solution was simply emptied into a special receptacle and allowed continually to dry up. If the solutions had been contained in jars, with pieces of zinc suspended therein, the amount to be withdrawn would, according to the refiners' report, have been about half an ounce—worth perhaps sixteen or seventeen shillings. We should be very pleased if any other photographers who have investigated the matter would send us their experiences; we should be glad to publish their results.

Vanishing London.—Within a stone's throw of this office the demolition of many houses is in progress, and great changes are taking place in the appearance of more than one thoroughfare. Possibly these houses were not of much antiquarian or historical interest, but the fact that they *were* old, and have for many years formed a part of a neighbourhood which is gradually undergoing total transformation, should have made it worth while to secure authentic records of them for future use, should they ever be wanted. This kind of work, in our opinion, might form part of the duty of an official photographer appointed by the County Council or some similar body. We question whether photographs of many old parts of London that have recently been swept away are in existence. Who can tell how they would have been valued a century hence!

Photography and Criminals.—In the course of a conversation the other day with a well-known detective [be not alarmed, good friends, the conversation was mutually agreeable!] he informed us that detective officers and others, when making use of photographs for tracing persons eluding justice, or otherwise suspected, always, or at any rate generally, ignored the lower part of the face in their efforts at identification. The reason for this, as given, was that it is easy by obvious means to effect great disguise in the mouth and jaw, whereas from the nose upwards the features are not readily alterable. Hence, said our informant, a detective armed with a photograph of a suspected person, and meeting with him accidentally, disguised or not, would simply compare the upper part of the face, as shown in the photograph, with that of the original, and would be guided by the result of the comparison.

The Exhibition Season.—The Exhibition season has commenced. It opened on Tuesday last with the time-honoured Exhibition of the Royal Cornwall Polytechnic Society at Falmouth, which, from a photographic point of view, was more than usually interesting. A reference to the list of forthcoming exhibitions, given in another part of the JOURNAL, shows that, between now and the end of the year, something like a dozen opportunities will be available for the photographic aspirant after medals and other honorific distinctions. These latter are both cheap and plentiful, for it must be remembered that, in addition to sundry photographic publications, numerous non-technical papers now hold photographic competitions in which medals and other prizes are awarded. Not the least of the Photographic Salon's claims to our good wishes is the fact that it has cut itself adrift from the medal system, which in many of its modern aspects is most undesirable.

The Royal Photographic Society's Exhibition.—Reference to the Exhibition season reminds us that the Thirty-ninth Annual Exhibition of the Royal Photographic Society of Great Britain will open during the ensuing month. It will be inaugurated by a Conversazione on Saturday, September 22, and will remain open daily (Sundays excepted) from Monday, September 24, until Wednesday, November 14. Admission (from ten a.m. till five p.m.), One Shilling. It will also be open on Monday, Wednesday, and Saturday evenings, when lantern slides will be shown; admission (from seven to ten p.m.), Sixpence. The following is the rule as to the reception of exhibits:—"Exhibits sent by carrier must be carriage paid, and addressed: The Secretary, Royal Photographic Society of Great Britain, 50, Great Russell-street, Bloomsbury, London, W.C., and should arrive by Saturday, September 8, at the latest, in order to ensure the delivery of the exhibits at the Gallery before closing time. No packing-cases can be received at the Gallery. Exhibits, including pictures, negatives, transparencies, lantern slides, apparatus and appliances, sent by hand, will be received at the Gallery, 5a, Pall Mall East, only from nine a.m. to nine p.m. on Wednesday, September 12, after which time and date no exhibit can, under any circumstances, be received for competition." Blank entry forms and any further information respecting the Exhibition, also nomination form for membership, can be obtained from the Assistant-Secretary of the Society, 50, Great Russell-street, London, W.C.

Messrs. Lumière's Improvements on the Lippmann Method of Colour Photography.—In a communication to a Lyons Society, Messrs. Lumière give some particulars of their improvements in the application of M. Lippmann's method of colour photography by interference. Briefly summarised, these are as follows: The substitution of a completely transparent gelatino-bromide of silver emulsion for the comparatively opaque and insensitive albumen emulsion; orthochromatising with methyl violet and erythrosine, and using a picric acid screen. By these means Messrs. Lumière claim to have obtained a curve of colour sensitiveness identical with that perceived by the eye. They also remark that hygrometric conditions exercise a notable influence over the sensitiveness of the films used for interference photography. The plates are dried in the air at 25° C. Special means are taken to maintain a constant temperature for this purpose. Modifications in the arrangements of the mercury bath and in the developer employed have been also introduced, particulars of which are not given, although it is mentioned that the image is intensified with mercuric chloride followed by development. The finished pictures are backed with black varnish and mounted under prisms of less acute angles than those previously employed.

The Precious Metals.—So many photographers nowadays use ready-sensitised papers that the fluctuations in the prices of silver do not interest them, while, since the collapse of the platinum ring, platinotype paper, is so uniform in price that variations in the value of the raw material pass unnoticed. Still, the fact that nitrate of silver is now to be bought at two-thirds the price old hands remember it selling at is interesting enough to those who sensitise their own paper. The metal itself so far remains under half-a-crown an ounce, fluctuating in the neighbourhood of twenty-eight pence per ounce, but it may be said that there is a feeling amongst experts that a gradual rise may be looked for, especially if China should come into the market, as is reported likely, to borrow a million of money. In that case it will be no unreasonable expectation that the prices of dry plates and printing papers may go up. On the other hand, the enormous output of this metal is pointed at as likely to keep prices down in default of an international bimetallism. In 1881 the world's production was 2,592,000 kilos; in 1892 nearly 6,000,000. The actual ratio of values between gold and silver has been 1 to 15·56 in 1870, 1 to 18 in 1880, 1 to 22 in 1890, and 1 to 23·73 in 1893. The amount of gold yearly raised was about 158,000 kilos each year from 1881 to 1888, but it then increased, through the South African gold production, to 192,000 kilos in 1892. With regard to platinum, there are fair grounds to hope for a reduction, seeing that its production is increasing in America, the sources hitherto available having been very limited. In British Columbia platinum ores have been discovered which give great promise, while at Denison, Ontario, nickel ores containing about one half per cent. have been observed.

An Exhibition of Rejected Photographs. — We are informed that the Committee of the Central Photographic Club have decided to hold an Exhibition of photographs that have been rejected by the Salon and the Royal Photographic Society of Great Britain. The Committee say that there is no idea whatever in their mind of opposition to the managers of either of these exhibitions, who have done and are doing so much to foster the art. "Those who see the pictures which adorn the walls at Dudley Gallery and Pall Mall may recognise what class of work meets with the approbation of the managers, but have little opportunity of ascertaining (save in a limited and personal sense) what is not acceptable. For this reason the Committee have decided to hold the Exhibition." They hope that those ladies and gentlemen whose pictures are not hung at the Salon and R.P.S.G.B., will let them have the satisfaction of showing them, and so provide a very valuble object lesson. "No selection will be made, but every picture sent in will be hung. The Exhibition will open with a Conversazione on October 13, and will remain open for six weeks. Pictures will be received up to October 6 and there will be no charge for wall space. The Committee will, if allowed, collect the pictures free of all expense to the exhibitor from the agents." If we remember aright, the enterprising management of the place of entertainment called the Royal Aquarium some time ago tried an experiment resembling the above in regard to the pictures rejected by the Academy and other exhibitions. The experiment, we believe, was not a success for two reasons: (1) Most of the artists did not care to advertise the fact of their pictures having been rejected; (2) the public took not the smallest interest in the Exhibition. We do not suggest that the same fate will overtake the undoubtedly well-meant efforts of the Central Photographic Club, but we cannot refrain from asking, *Cui bono ?* Besides, most of us are chary of parading our failures before the amused and mocking eyes of our friends, and photographers like other people, are as strongly tinctured with that feeling as other men. Still, possibly our views of human nature are mistaken, in which case the Central Photographic Club's Rejected Exhibition may be an astounding success. We hope it will be.

DUBLIN CONVENTION NOTES.—VI.

(By our Special Correspondent.)

THE visitor to Cork, if a tourist, almost invariably proceeds farther west or north-west to see the far-famed Lakes of Killarney. There are so many who go daily, at least in the summer season, that the facilities for making this visit are now very great. You book in the morning for Killarney at the Cork railway station, and proceed by rail to the town of Bantry, passing the town of Bandon on the way.

To explain as neat a bit of Irish wit as one can readily meet with, it is necessary I should say that the town of Bandon was at one time exclusively Protestant, Catholics not being permitted entrance, and, if I am correctly informed, it was walled around. On one occasion the witty Dean Swift and his servant entered the town, and on the gateway the Dean wrote as follows:—

"May enter here Jew, Protestant, or Atheist,
Mahometan, or Greek, but not a Papist."

The servant, equally witty as his master, tarried behind, and wrote immediately beneath:—

"Whoever wrote this wrote it well,
For the same is posted on the gate of hell."

I have come across several versions of this encounter of wits; the foregoing, with which I have taken a verbal liberty, is just as likely to be true as any of them. Without having the slightest intention of saying a word on the subject of the rival systems of religious belief prevailing in this or any other part of Ireland, I must still say that I saw no unpleasant outcome of the different forms of belief all the time I was in the green island. But, then, I had not visited Ulster, where things may possibly be different.

Bantry, I would imagine, is a typical Irish town. It lies near the head of one of the numerous forks projecting inland from Bantry Bay, which is an inland sea rather than the old-fashioned bay the configuration of which was taught and outlined in our schoolboy days. Here is the terminus of the railway from Cork, where we must descend and wait the preparation of the four, six, or more coaches by which we are to be conveyed to Glengariffe, the next stopping place. The day of our visit happened to be a fair, and under no better circumstances could we have seen a market. Carts were there by the hundreds, every one of them loaded with pigs, and nice, clean-looking animals they were. There were horses innumerable, and, without being competent to discourse learnedly on horseflesh, I could at once see that they were smart young creatures, qualified by their good looks for possibly at some future period assisting our upper ten in airing themselves in Rotten Row, or perhaps as likely, in breaking the neck of some gallant in a steeple-chase. Be this as it may, the horses at the Bantry fair, wild and half broken as they looked, were

certainly beauties. Did I photograph them? Well, considering that the day was somewhat drizzly, and that I was perched on the top of a waggon, five on a seat, with space bare enough to suffice for unlimbering one's pipe, and, further, that it was realised that the whistle which was to start the whole cavalcade was momentarily expected to be heard, there was small chance for any successful photography there. Hence the piece of advice I have already given, If you wish to photograph, don't go with a party.

I was told that there was not a spot between Bantry and Cork (a matter of forty or fifty miles) that had not been the scene of battles in former times, and Irish history quite endorses the statement. A drive along Bantry Bay—say fifteen miles—and we eventually reached Glengariffe, beyond which there was no conveyance to be had that day. A more romantic and beautiful spot it is difficult to conceive of. Here we remained till next day, and bagged several good negatives. The bay contains several islets, and the well-wooded hills slope down to the water side. This is the place concerning which I have spoken as having Cromwell's Bridge in its vicinity, and as being the habitat of the young gentleman who so nicely distinguished between photographers and artists. But, emphatically, it won't do, if you wish to photograph Glengariffe, to be in a hurry to do it, you must lay your account with remaining two or more days. Every kind of scenery is here to be got, but you cannot do everything in a few hours. Take my tip, and, when touring with a camera in the south-west of Ireland, allow yourself the privilege of breaking the journey here and there, for a day or two, wherever you feel inclined to do so.

Leaving Glengariffe, the char-à-banc train, which consisted of six conveyances, drawn each by four horses, and accommodating from twenty to thirty passengers each, proceeded over the mountains to Kenmare. The country here, I assert most unhesitatingly, is the finest that ever was made for conducting a fight of the guerilla class of warfare. And it probably was, nay, must have been, the scene of many such "shindies." But all now is peaceable, and long may it continue to be so. On reaching the top of a mountain which separates Glengariffe from Kenmare the cold was severe, and the mists sadly interfered with the views occasionally had of the noble Bantry Bay. But once over the mountain and the descent was easy. Peat bogs gave way to smiling gardens, and eventually the pretty little town of Kenmare was reached. From here it is optional whether you continue the journey to Killarney, through the Gap of Dunloe, by coach or proceed by railway. I chose the latter on account of the exigencies of time.

Killarney is what the Americans would designate a "one-horse" town. But it contains some good hotels, several very fair shops and churches, but not a single photographer. This leads me to remark that, when strolling around its suburbs one evening, I lighted upon a photographic caravan. Fraternising with the proprietor, I soon discovered that he was a man that was quite up to date. He had instruments of the best London make, knew everything that was known as to plates, developers, and the technique of the art generally, had THE BRITISH JOURNAL OF PHOTOGRAPHY weekly supplied to him from Dublin as it was published, and, in short, kept himself *au fait* with all that was going on. I and my travelling companion spent a very pleasant hour with him, during which he narrated many of his experiences as a peripatetic, the schemes he laid for bringing business and his financial success, which I do not consider it would be fair for me to reveal. This much I will say, that he made a better thing of it, from a banking-account point of view, than a great number of London photographers; and his pictures, up to 10×8, were as good as one sees any day and anywhere. When business got exhausted in one place, he had horses attached to his waggon, in which he lived, and went to another. I have several of his pictures beside me as I write, and they reflect credit upon his technical and artistic skill.

There are three lakes in Killarney, all of them beautiful, the upper one surpassingly so. It is hemmed in by lofty mountains, the MacGillicuddy's Reeks (one of which, Carran Tual, is the highest mountain in Ireland, being 3414 feet high), lying in the vicinity. The lakes are all connected by a water way, that connecting the upper and middle one, Muckross Lake, being two miles long, rather narrow, and in places very deep. The famous Muckross Abbey is situated near the margin of this lake. We pass from this to the large lake (Lough Leane) by a narrow rapid that taxes the skill of the boatmen to prevent the boat from being smashed on the rocks. Here were to be seen several artists at work, painting choice selections from the rich and varied surrounding scenery.

A small storm which arose when we were on Lough Leane sent the spray flying over us, necessitating the close covering up of the cameras; but the boatmen were skilful, and we reached the Isle of Innisfallen in safety and landed. This is described as the most lovely of all the islands on Lough Leane. It is uninhabited, and contains twenty-one acres of the finest land. Here are groves of great beauty, and so profusely luxuriant as to be almost impenetrable. Stately oaks and other trees abound, and there is a great holly, believed to be the largest in Europe. The abbey, which must have been extensive, is in a sad state of decay, and almost bids defiance to the camera; but, notwithstanding the strong wind that was now blowing, I and my friend managed to obtain photographs of disconnected pieces of the ruins. The abbey was built in the year 600. In A.D. 1180 the O'Donoghue plundered and nearly destroyed the place, slaughtering several of the monks. No photographer visiting Killarney should omit seeing Innisfallen, but he should select a fine, calm day for the purpose.

Ross Castle is an imposing structure, and ought to be visited. It stands on what is called an island on Lough Leane, but is reached from the land by a bridge thrown over the moat. It was the stronghold of the O'Donoghues, who were considered as kings in that part of the country. This castle makes a capital picture. There are also several fine cascades near Killarney which ought to be visited, among them being O'Sullivan's Cataract and Torc Falls.

The road along the lakes on the Muckross side is exceptionally good. It is said to have been constructed at a cost of a thousand pounds per mile, which is very probable, seeing so much of it is constructed out of the rocky mountain side. Very fine views of the lakes are obtained as one drives along. The arbutus tree flourishes abundantly everywhere here.

Were I asked what sort of camera is best adapted for such Irish scenes as I have inadequately endeavoured to speak of, I would be troubled to give a reply. Some subjects, such as mountain, lake, and bay ranges, would require a panoramic camera to do proper justice to them. Nothing but a stereoscopic camera can suffice for scenes embosomed in trees, cataracts, waterfalls, and deep ravines, smothered in foliage. A skilful photographer will meet almost every case in a fairly good way, except, perhaps, the last, by having a lens of very wide angle as well as others of more moderate angle fitted to his camera.

ON THINGS IN GENERAL.

THE very interesting discussion now being carried on in the correspondence columns of this JOURNAL on the question of combined *versus* separate toning baths treats upon the most important subject in photographic technics that has ever come before the whole body of camera-users. The most unfortunate aspect of the whole is, however, the fact that all we know of the danger of the combined bath—as is the case with so much that is photographic—is purely empirical. It is most desirable that all who desire to possess a reasonable view of the subject should, if they are not well read in the literature of the art, make themselves acquainted with what has gone before. Thirty years ago the combined bath was virtually the

only one used to tone albumenised prints. After some years of its employment, it was gradually forced upon the knowledge of photographers that a vast number of their most cherished prints are rapidly fading away, and as time progressed this question of fading became most vital. The question was, for the first and only time from that day to this, attacked theoretically and practically by Messrs. Davanne and Girard, and their treatise upon the subject is a part of photographic classics. Then there came upon the photographic world the announcement of the alkaline gold toning process, very indolently received at first, appreciation being quickened by Mr. Maxwell Lyte's phosphate of soda formula, till, at last, the citadel of the combined bath was taken by storm and razed to the ground. The leading popular photographer of the day fought against it, and for months after all his *confrères* had abandoned it turned out tens of thousands of prints by the old method; but, after a stubborn fight, he also gave in, and the combined bath was—"dead." And so it has remained till the introduction of gelatino-chloride papers, and now we are asked to believe in its virtues and go back to the discarded, discredited solutions of our forefathers. The question at once presents itself, why should a process of proved disadvantage with albumen paper be advantageous with printing-out paper? No one has answered this query beyond saying he can show prints two or three years old absolutely devoid of a trace of fading. But this could be done, and yet can be done, of prints made thirty or forty years ago; so that the argument is valueless. The true answer will not be found till some one can point out and prove why this discrepancy occurs, and until then it would seem far wiser to use the separate baths. So far as experience goes, it is fairly well understood that one if not more of the leading photographers in the profession has had such an ill experience of printing-out papers and the combined bath, that he has entirely abandoned the use of one of the most extensive installations in the country for utilising this paper. At the same time, it must in fairness be said, that equally eminent men have adopted it for some time, and still have nothing but praise for its valuable qualities. When will another Davanne and Gerard arise to settle the question and gain imperishable photographic renown?

Simultaneously we are having a violent renewal of the professional *versus* amateur controversy. It is really sad to see such idle verbiage as is showered upon us on this topic. No amount of talking will, if ever it were advisable, eliminate the amateur element. But why should it be advisable? The whole art and science is founded upon the work of the amateur, who has behaved nobly for the benefit of photography. Why, then, should men, who have mostly taken it up professionally after starting life in some other direction, attempt to throw mud on the very men who follow in the footsteps of those who made a new start in life possible? What is wanted is a means of counteracting the dishonourable conduct of some—a minority—of amateurs. We have the authority of our dead poet-laureate for the statement that want of thought, not want of heart, is the cause of so much evil, and I believe this to be the case with some of the questionable acts of amateurs. It, however, is difficult to believe that the amateur quoted by one of your correspondents, who wished for some particularly good prints, as he was going to have them enlarged in London, was not aware of the meanness and injustice of the course he intended to pursue. But I can give an instance where one of the general public was so far devoid of a sense of propriety as to act in a still more contemptible manner. I myself was an eyewitness to a gentleman coming to a photographer's studio and asking the proprietor to lend him the negative of a very beautiful picture he had made of this client's child. He actually had the effrontery to explain that he wanted it for the purpose of getting an enlargement made, as it could be better done than from a print, and he knew of a place where it would be executed more cheaply than at the photographer's in question! The remedy is difficult to discover. There can be no doubt that some of the large enlarging firms supply the general public at the same price as they do professional photographers. There is no law to prevent them, but photographers have themselves to blame for assisting these enlarging firms to destroy their business in this manner by supplying them with the sinews of war through the increased facilities obtained by these very photographers sending work to them—the enlargers.

FREE LANCE.

JOTTINGS.

So common and so hackneyed is the term "Roy al" nowadays, that, at the moment, when I read that the Photographic Society of Great Britain was in future to enjoy the coveted prefix, I was inclined to regret that the Society was about to exchange the severe simplicity of its old style of designation for one savouring of Court patronage and favour. On second thoughts, however, I soon saw that the promotion of the parent Society to "Royal" rank was matter neither for regret nor carping, and I hasten to seize the opportunity of joining in the congratulations of which the Society is the recipient. In its new dress the Society is likely to gain in general prestige and importance, and photography and all the many interests that are now comprehended in that word will also benefit. The views on the subject put forth in your leading article last week, so completely express the opinions which I myself should have submitted, that nothing is left for me but to cordially endorse them, and to wish the Royal Photographic Society every success in its new baptismal circumstances.

But, while patting the Society on the back over its generally well-merited good fortune, I may perhaps be allowed, as a very old member, to point out one respect in which it has seemed to me that it has not particularly well deserved it. I allude to its neglect to induce professional photographers to become members. Time was, as it has been more than once pointed out of late, when the Society had a large number of professional men on its membership roll; but for years past the number has gradually diminished, until now, I believe, only about fifty out of its 400 members are professionals—a very small proportion compared with former times. Into the cause of this falling off I do not intend to go; no amount of historical examination and analysis will alter the fact I have stated. But I hope that fact will not be lost sight of in any action which the Society may take to show its appreciation of its newly acquired dignity, and that inducements will be plainly held out to professional men to take up membership. There are between 4000 and 5000 of them in the country virtually without a representative Society at their head, and I am confident that, if the proper means be availed of to tempt them, they will flock to the "Royal" standard in their hundreds. And, among the proper means for tempting them, I do not include—well, never mind what I don't include, dear reader. I leave you to supply the missing words.

Apparently the long and bitter controversy under the title of "A Call to Arms," and in which the usual recriminations between professionals and amateurs and professionals and dealers were freely—perhaps too freely—indulged in, has run its course and stopped. If any one cares to have my opinion on the principal point at issue, which was the complaint of several photographers at being unable to have the advantage of dealers' terms without being *bonâ-fide* dealers, he will find it expressed in this JOURNAL for March 16 and 30 last. I see no reason to depart from the view then expressed, which was, in brief, that the photographic dealer or middleman is an indispensable factor in photographic trade. He stands, and of necessity must stand, between the producer and the consumer, and if photographers would only realise that indestructible fact, they could more profitably employ their time than in exuding abuse of photographic manufacturers, who are only conforming to the inexorable laws governing the distribution of manufactured goods. The modern manufacturer who entirely ignored the dealer, his best friend, and endeavoured to do all his business direct, would soon find out his mistake.

As to the sempiternal denunciations of the malevolent and wicked amateur who takes the bread out of the professional's mouth, I am content to regard such complaints as mainly emanating from men who, smarting under the effects of temporary depression, are impelled against their better judgment to seize upon the paltriest pretexts for placing the cause of their misfortunes at anybody's door but their own. I am almost sick and tired of reminding professionals in this column that, if they would only "be up and doing" and take advantage of the many opportunities for improving

their work and their business, financial success would follow as assuredly as the night follows the day. Take, for example, stereoscopic portraiture. What possibilities of success lie in that wholly neglected branch of photography! So, photographers, leave off crying and whining, *and get to work!* Stop calling names and put your houses in order. Oh, for a new Carlyle to lash you out of your tearful torpor into a healthy realisation of what can be done by earnest, steady, persistent effort!

Cases such as that mentioned in the letter headed "A Mysterious Negative," published in the JOURNAL of the 17th, are extremely common. The cause I should set down as accidental pre-exposure after the plates left the works. Some people are inclined (as, indeed, they are in all cases of doubt and difficulty) to blame the plate-maker for the unwelcome phenomena, but the idea is too absurd for serious consideration. Fancy Messrs. B. J. Edwards & Co. and the Britannia Works Company so arranging their manufacturing installations as to allow images of old men's hats, children's dresses, geometrical figures, &c., to impress their plates during the process of manufacture! Those who know anything of the interiors of modern dry-plate factories will recognise the impossibility of anything of the kind being likely to happen. Still, for all that, the appearance of these pre-exposed images is very mystifying and amusing. I remember a case of the kind that occurred in the very earliest days of gelatine dry-plate work. An amateur had a negative of a landscape and trees. Up among the trees was the image of a tricycle! Now tricycles do not usually grow on trees, so he furiously blamed the plate-maker for having allowed this particular plate to be exposed before it was sent out. I forget exactly how the matter ended, but I rather fancy that, under a somewhat severe cross-examination, the photographer himself admitted the possibility of having had something to do with the pre-exposure of the plate.

Mr. Macfarlane Anderson's article last week, on "Colour-Value Negatives for Type Colour-Printing," contains some rather startling statements, the accuracy of which I do not find easy to realise. What it all amounts to is this: that he finds orthochromatic plates useless for obtaining colour values, but that he secures his effects by means of a specially made gelatino-bromo-iodide plate used in conjunction with colour filters (screens) of Carbutt's make. I am not, of course, in a position to dispute the correctness of Mr. Anderson's deductions without having an opportunity of repeating his experiments, but I do entirely traverse his charge that bathing ordinary plates or rendering the emulsion itself orthochromatic is "needless and erroneous," and that "any sensibility obtained by plates so treated to the less luminous" (? more luminous) "colours of the spectrum can as readily be obtained with the so-called ordinary plate when used with the proper screens or colour filters." To my thinking, this sentence simply shows that Mr. Anderson is ignorant of the very fundamentals of the theory and practice of orthochromatism. Still, for the common benefit, may I ask him to give us a little information as to the nature of the screens and plates he uses?

What a dismal summer it has been for outdoor photography! Last year the weather, as we all remember, was faultless, and everybody profited by it, notably the itinerant and beach photographers. By the way, talking of beach photographers, there is an impression that this branch of the black art has sunk to the mere shadow of what it formerly was. I should not be surprised to find, however, that just now (given good weather) it is as flourishing as it ever was. I had an opportunity recently of forming a judgment as to how much photographic material a large number of beach photographers got through in the course of a season, and, taking a general line by the instances given me, I should say that on the whole it was enormous. I venture to think that there is many and many a photographer with a handsome house in a fashionable neighbourhood, beautiful specimens and gaudy show-cases, who would freely exchange his pecuniary position for that of many a humble man and brother on the beach. Ah, but the man on the beach works while he has the chance, and is sublimely indifferent to the amateur bogey.

COSMOS.

GELATINO-CHLORIDE AND PERMANENCE.

USERS of gelatino-chloride are beginning to find that it is not quite all that they have fancied it, or that its friends have claimed it to be, and that, like the much-abused albumen, it has its faults. But it is decidedly ludicrous, considering that when it was introduced but a few years ago one of the chief advantages claimed for it over albumen was its greater permanence, to find now that the principal complaint against it is its want of that quality. Only a week or two since, a correspondent alluded to the "seductive but fleeting beauty" of gelatino-chloride, while for some time past a discussion has been going on on the subject of combined toning and fixing baths, which are by many considered to be the dangerous element in this connexion, and the statistics of M. van Bosch, quoted last week, go far to prove such to be the case.

But the real question is, whether gelatine, on the one hand, or the combined bath on the other, is necessarily conducive to fading, or whether, because prints that were toned in the combined gold and hypo bath, or even without gold at all, many years ago, have proved permanent, all should do so. So far as I can see, there appears to be no reason why gelatine as such should induce any tendency to fading, nor that the combined bath, if properly used, should bring about the same result. But it does certainly seem as if the conditions under which gelatino-chloride paper is worked at the present time are, to say the least, not conducive to stability. I take it, in fact, that a gelatino-chloride print, carefully made and toned in the combined bath, may be as permanent as anything in the nature of a silver print can be. I very much doubt whether, as they are turned out in quantities in ordinary every-day work, such is the case. It is perfectly easy to deal with a single print in a manner that is impossible with a number, and it is folly to argue that, because one picture that may have had specially careful treatment has stood for thirty or forty years, others that have had no such special care should necessarily behave in a similar manner. I have albumen prints of my own, made upwards of twenty years ago, that were not washed for more than ten minutes after fixing, and which are still good, but they had individual treatment. There would be little reliance to be placed upon the permanence of a big batch of prints treated in the same way, however.

Considered chemically, gelatine stands at a decided advantage over albumen as the basis of the photographic picture, although perhaps it may be inferior from a physical point of view, inasmuch as its thick and absorptive, and at the same time easily damaged, film renders it more difficult to free it from deleterious salts. For this reason gelatine prints require more delicate treatment than albumen, and can scarcely with safety be subjected to the somewhat rough, if searching, action of many of the washing machines that used to be, and still are, used with the latter. For this reason, too, the prints are directed to be turned over singly from one vessel of water to another a few times, which subjects them to less risk of injury than washing in running water, and which, if honestly performed, is far more effective; but, when it is shirked or slurred over, there is where the danger commences. Imperfectly washed prints rushed through the alum bath to "eliminate" the hypo, or, in other words, to deposit all sorts of dangerous matter in the print, are the ones that fade, and that quickly; but, so far as my own experience goes, properly and fairly washed, they are as permanent as need be.

So far as the combined toning and fixing bath is concerned, I have had no personal experience with it in connexion with gelatine papers, for the simple reason that I distrust it. Not because its results may not be as permanent as others when, as I have said, carefully used, but the risks run in the course of every-day work are too serious to recommend it. As compounded for modern use, the combined bath looks a "deadly mixture," but, if made according to the directions and not *over-used*, there seems to be no special reason why it should not give permanent results. But there is where the difficulty arises. With the separate toning bath, when the gold is exhausted the bath ceases to tone, and gives warning of the fact; but with the combined bath the gold may be all used up and sulphur toning go on. If the gold is exhausted then, too, the bath will be too weak to act properly, and so the seeds of decay are sown. Here, I imagine, is where the danger lies; we naturally try to get

the most we can out of our toning baths, even the most careful of us, and it is the want of an indicator of the commencement of sulphur toning that misleads many, and gives rise to many of the complaints against the combined bath.

Not that even sulphur toning pure and simple—*i.e.*, without gold—need necessarily give fugitive results, though I do not wish to go into that question here; but, when sulphur toning commences in the combined bath, it is accompanied by a partial failure in the fixing, as I have already stated; and this it is that does the injury. If too many prints are passed through the same bath, although it may go on toning—and, for the matter of that, tone better—the quantity of hypo becomes too small to render the silver into the soluble condition; and so, despite the most careful after-washing, much of it remains in the picture. The image itself may be permanent, but the silver left behind by the spent bath causes the destruction of the picture.

As a practical commentary on the permanence or otherwise of prints toned with gold and hypo, I may mention that the frontispiece—a silver print—of my copy of *Delamotte's Practice of Photography*, third edition, 1856, is so toned—at least, presumably so, for the only toning formula given in the work is as follows:—

Solution of chloride of gold, equal to	4	grains.
Nitrate of silver	30	„
Hyposulphite of soda	4	ounces.
Water	8	„

This, it will be noted, is a combined toning and fixing bath of a strength that appears now extraordinary—one ounce of hypo, in fact, to two ounces of water, or at least three times as strong as our modern fixing baths. Yet, after the use of this, a second fixing bath is given of hypo alone. Whatever the original colour of the print may have been it is impossible to say, though Delamotte speaks of "rich, dark violet tints." It is now a sepia brown, very suggestive of sulphur toning or fading; but the whites are remarkable for an entire absence of yellowness, such as would arise from decomposition of hyposulphites left in the paper. It is, of course, possible the original colour was as it is now, for it is a class of tone that was popular formerly; but, at least, the absence of yellowing speaks well for the use of the second fixing bath, a practice which might be adopted with advantage at the present day by those who find the combined bath lead to fading.

Turning from the combined bath and hypo to sulphocyanide, I have, on a former occasion, in these columns, questioned why the latter salt should possess any better character in connexion with fading and sulphuration than hypo. They are both sulphur compounds, and both very unstable, and, as a matter of fact, poor hypo is rather the more respectable of the two as a salt, *i.e.*, less liable to change. With some of the commercial papers, the sulphocyanide toning bath, separate, of course, gives very good results so far as colour is concerned; but with others, and one kind of paper especially, it is impossible to tone a vignette without producing the nasty pink tint that is so objectionable. If the bath is pushed beyond its proper toning power with this particular sample of paper, the pink colour becomes yellowish-brown, which is even more objectionable; but, curiously, if these prints be left in water for some hours, the colour reverts to pink of a less pronounced character than would be produced by a bath in proper working order. On the whole, I am personally not much inclined to place much greater confidence in sulphocyanide than in hypo.

There is one other objectionable feature in connexion with the employment of the combined bath as at present used, namely, the "varnishing" gloss it gives to the prints in consequence of its hardening action on the gelatine. Of two prints toned with combined and separate baths respectively, the former will, when mounted, have a much higher glaze that might be æsthetically described as "vulgar." After burnishing, however, the other print would have the finer and softer surface, while very little impression is made upon the varnish-like surface of its rival. Again in mounting, the hardening effect of the combined bath makes itself felt. A friend of my own who has habitually used it has given it up, or is about to on account of the difficulty it causes in this way.

But, in addition to the troubles that arise from faults on the part of the users of gelatino-chloride paper, or from the ill effects of unsuitable treatment, the manufacturers will have to do something more in the way of perfecting the paper sent out before albumen can be fairly said to be "scotched," let alone killed. The emulsions used may be, and probably are, as good as we may ever expect to have, but the paper on which they are spread (I am speaking of no one make particularly) and the manner in which they are coated in some cases are enough to drive any one back to albumen. I admit the "seductiveness" of gelatino-chloride results, and its convenience for many purposes, but I prefer to trust to albumen—home-sensitised—for anything I am particular about.

W. B. Bolton.

KEEP UP YOUR PRICES.

[American Journal of Photography.]

"Big trade and small profits" is a very poor business scheme for the photographer.

The art of photography, though a mechanical art in a great measure is one which requires an amount of skill and talent which puts it away above many of the ordinary trades pursuits, and when conducted as a business it requires a combination of artistic talent with method and business tact which puts it out of the pale of the line of requirements of the mere tradesman.

To simply buy and sell at a profit is one thing, but to successfully conduct a creditable photographic business is another. When the tradesman increases his business by small profits and increased sales, it is a comparatively easy matter for him to call in aid to do the mere handling of the goods, but this is not the case with the photographer.

A well-conducted photographic business must necessarily be evolved in so large a degree from its head that too great an extension of it, or manifestation of it, must necessarily result in its deterioration and ultimate dissolution. So little is it understood generally that the work of an artist must necessarily be the unit of his brain and hands, that the remark is often made to artists, "I suppose when you are very busy you call in help." Now, there can be no help for a true artist in the pursuit of the higher branches of his art; and, although this may not truly be said to be the case with the photographic artist, yet his pursuit partakes so much of the character of a fine art, if he be a good photographer, that he cannot extend his skill beyond a certain point. He must personally, and by his own individual talent, conduct and supervise his work, and therefore, if he is taxed beyond a certain point, he must needs break down, or his work must be of inferior quality.

What a temptation there is bearing the whole time upon the photographer, who has cut his profits down to the very lowest point, to let his work go at just barely passable, and that is all. Over-strained, as we will admit he may be, by a reduction of prices, for a time at least, he has not the necessary leisure to consider and improve as he goes along; more must be relegated to assistants, with less personal supervision, and the consequences must inevitably follow that there will be tardiness in filling orders, and unequal and imperfect, and consequently discreditable, work. Want of promptness and inferiority of production will tell sooner or later in the photographic business. It must be admitted that there are always foolish people to be found who will be attracted by the cry of cheapness. But the photographer must remember that it will not do for him to attempt to cater to this class, because his business cannot be conducted upon a sufficiently extended scale, as the cheap clothing business may, to enable him to acquire a fortune, or a bare competence even, before his cheap ways have swamped him.

Let any enterprising, talented, incoming young photographer take the pains to instruct himself in the business methods of those photographers who have come out best, both financially and in reputation, after a twenty-five or thirty years' career in the business, and see whether the successful men have been the cheap men. We think he will find that those who are best off are the ones whose aim it has been to produce good work, work such as they might always feel did them credit, and who adhered strictly to fair prices—prices which remunerated them in a fair way for the labour and talent which they bestowed upon their work.

Any sensible individual, if he stops to reason, will see that it is a mean spirit of rivalry, which can only end in short-lived success, to plant yourself beside an honest, well-established photographer, either in city or country town, and by cutting prices rob him of a share of his well-earned business. If you continue, you ruin the profits for both. If you, after a time, remove, to repeat your game in a new location, what have you

gained? Surely nothing in reputation, and the expenses of bandying about will soon have eaten up your miserable, scanty profits, If it becomes necessary to locate yourself in the vicinity of others of your craft, honest, good price men, or cheap men let them be—keep your prices up, and let your competition with them be in the excellence of the work. Instead of doing cheaper work than they do, do better work. Let the competition be a *best man* competition and not a "cheap John" competition, and, if you crowd out your rival, it will then be simply carrying out one of nature's infallible laws, namely, the survival of the fittest.

The photographer, somewhat like the artist painter, should not espouse his business with the sole view to making money. If his aim be the acquiring of a fortune, he should choose another field for his talents. A few instances there may be wherein a considerable amount of money has been acquired even in a comparatively short time by photographers, but these must be looked upon decidedly as the exceptions and not as the rule. Such instances have been the result of remarkable business tact and skill, and fortunate location, certainly not of cheap work.

True it is that there are instances of what may be called daring men in their pursuit, whereby skill, together with assumption and bold business methods, succeed in obtaining very high, we might well say exorbitant, prices for what they do. They cater to a small class, that think because a thing costs much it must necessarily be of superior quality. But this class is too small to make a general rule af such business a success. It is much safer to aim for the individual who wants a good picture, and is willing to pay a price for it that will honestly repay the skill bestowed upon it—and neither more nor less.

XANTHUS SMITH.

MEZZOTYPE.

AT the last meeting of the South London Photographic Society the President (Mr. F. W. Edwards) in the chair, Mr. C. F. Robinson gave a demonstration of the working of mezzotype paper. The paper was, he said, prepared in three degrees of roughness. To ensure success, it was necessary that the instructions be properly carried out. Printing was done in the usual way, and the print, after removal from the printing frame, was immersed in a bath of common salt one ounce, water twenty ounces, to convert the free nitrate of silver into chloride. It was then thoroughly washed, to get rid of any acid that might have been left in the paper and also the salt; if any of the latter remained in the print, toning would be unequal. The toning bath used should be weak, not more than half the usual strength. Acid toning baths "purged" the colour of the print, therefore deeper printing was necessary when they were used. The demonstrator recommended a palladium bath for sepia tones, compounded as follows:—

Chloride of palladium solution	15 minims.
Citric acid	20 grains.
Water	10 ounces.

The print was toned to a warm purple, and after rinsing in water, was transferred to a bath of carbonate of soda, quarter ounce; water, ten ounces. It was afterwards washed, to remove the carbonate of soda, and fixed in a hypo bath. The latter should not be more than one-half the normal strength, and for a longer time than usual allowed for fixing. By that means no colour was lost.

The following palladium bath may be substituted for the above, in which case toning must be to a brown colour, and not beyond. Proceed as before:—

Chloride of palladium solution	½ drachm.
Citric acid	20 grains.
Common salt	30 ,,
Water	10 ounces.

Being asked whether the results were permanent, the demonstrator said he believed them to be so, and had not noticed any deterioration in any prints he had had under observation during the time the paper had been on the market, viz., eighteen months.

Discolouration of the back of the paper need not be taken notice of.

ROYAL CORNWALL PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.

THE *Daily Chronicle* says:—

The Sixty-second Annual Exhibition of the Royal Cornwall Photographic Society, opened at Falmouth on Tuesday last, will be memorable as the first ever dévoted to photo-reproductive processes. Not that the innovation usurps the whole space. The usual features of interest—the oil paintings, the local arts and crafts, and especially the gallery of photographs which, for a quarter of a century has won this annual Cornish show a special record in the annals of the camera—are still present. But the new feature of the Exhibition particularly deserves careful study. The first surprise is to find that the processes—so new when compared with wood-engraving—date back far beyond those last few years which have brought them prominently to public notice. For instance, in a book, Belloc's *La Photographie* (Paris, 1855), we find an excellent photo-litho frontispiece by Auguste Byr, not inferior in many respects to the fine photo-lithos now shown in Falmouth by Messrs. Sprague & Co., which, as so-called "ink photos," add to the attraction of the *Builder* and other architectural journals. A volume of the *Photographic Journal* lies open at the number for July 16, 1860, which has a plate done by the swelled gelatine process, which is up to the average of the excellent work of A. C. Dawson & Co., familiar in magazines to-day. A photogravure by Fox Talbot, dated 1866, is another proof of the prowess of the man who did so much for photography, although made before the "dusting process" was used; and it is a respectable ancestor of the latest plates hanging near it.

Probably the average visitor will take most interest in the colour printing by means of photography. Not, be it observed, a photograph taken in colour—which is supposed to represent the one unappeased desire of artists and photographers—but printed impressions that, by means of negatives taken at three stages, through red, green, and blue glass, are ultimately translated in three blocks, which, printed in the complementary colours, yield a more or less accurate imitation of the colouring of nature. Here, with many variations of method, some excellent results are shown. The Photochrom Company of Zurich appears not to depend upon this mechanical making up of colour by interposed screens, but to prepare by hand various stones, as for chromo-lithography, to superimpose on the colour print a "key-block," which is a collotype print. The results, notably *Niagara* and *Cairo*, seem precisely like ordinary photographs coloured by hand with transparent water colours. As examples of expert registering they are superb. Husnik and Haussler have, in their three-colour prints succeeded in eliminating the draughtsman, and producing excellent commercial work for illustrations to seed catalogues and the like, which in its way may well replace common chromo-lithography. Hare & Co. also show capital work in the same way, their three-colour flower subjects and various pictures in three and more colours, prepared for the *Pall Mall Magazine*, &c., could hardly be beaten. The Photo-Chromatic Company of Belfast exhibit some wonderful examples of this class of block in three "natural" colours, with collotype superimposed, which might well pass for very expensive chromo-lithography.

In the more familiar processes of photogravure, and the many methods for illustrations with letterpress, which face us in every magazine to-day, it is hard to note even the most prominent. The Swan Engraving Company in Swantype—really half-tone—work (those engravings which, on close inspection, reveal a white network covering the whole subject) cannot be surpassed. Portraits of Ruskin, Walter Besant, various illustrations for the *Studio*, the *Pall Mall Budget*, and other periodicals, show (in the proofs printed by C. H. & W. F. Fisher) results that equal the finest specimens of French or American work, hitherto deemed far beyond English. The Acme Company, the Meisenbach Company, Carl Hentschel & Co., the Art Reproduction Company, &c., contribute work that touches the same level. For those who delight in rapid productions, a singularly fine block, made by Leslie E. Clift, shown side by side with the original wash drawing of a wet street, will be particularly interesting. Not that rapid production is theoretically desirable, except for events of the moment; but, if it must be used for ordinary pictures, through the dilatory habits of artists and editors, it is good to find these firms equal to the effort without loss of quality. Work showing an absence of the reticulated grain of the half-tone is shown by the E. R. A. Company and by Jenkins, of Farringdon-street; for special subjects it is better than the ordinary "screen." Collotype, another process midway between the costly photogravure and the inexpensive photo-lithograph, is here tempting the amateur with outfits costing a few pounds, shown by the Autocopyist Company. The more striking novelties of the show appeal to experts. One, a brass block in place of the softer copper, is obviously likely to catch on. It is sent by the Acme Company. The mysteries of fish glue as a substitute for albumen are too technical for detail here, it must suffice to say that the result of 24,000 impressions show the hardened fish glue which faces the copper still present. The importance of this new method cannot easily be estimated at present. The wonderful colour printing by Gillot, of Paris, the shows of apparatus and chemicals by Peupose, Baird, and Talbot, the excellent comprehensive selection by Bohrie, Gorter, & Co., of Munich, the collotypes by Adamson shown by Furnival's, the examples of rapid rotary printing in the *Illustrated Buffalo Express*, and a hundred other things, cannot be touched upon here, any more than the very fine group of photographs, and the oil paintings, and the *bric-à-brac*, which may be interesting locally, but are hardly exciting.

The following are the awards:—Professional: First silver medals—W. Scorer, W. J. Byrne, J. C. Burrows; second silver medals—R. H. Yeo, P. T. Lancaster; first bronze medals—R. Frost, J. H. Coath, W. J. Anckorn, G. A. Brightman, F. Bromhead, J. E. Gould; second bronze medal, J. W. Bennetts. Amateurs: First bronze medals—H. Tonkin, D. James, T. Brown, jun., E. Brightman; second bronze medal—A. Jane; hon. mention—A. W. Westrop. Photographic appliances: Silver medal—Geo. Hare.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,916.—"Improvements in Devices for Cutting Cards with Bevelled Edges for Photograph Mounts." Complete specification. B. McHUGH.—*Dated August*, 1894.

No. 15,959.—"Improvements in Photographic Cameras and Appliances in connexion therewith." W. E. HICKLING.—*Dated August*, 1894.

No. 16,091.—"Improvements in Photographic Cameras." Complete specification. H. SMYTH.—*Dated August*, 1894.

No. 16,208.—"Improvements in Changing Boxes or Backs for Photographic Cameras." A. RIDDELL and J. SINCLAIR.—*Dated August*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN THE METHOD OF AND MEANS FOR PRINTING ENGRAVINGS AND PROCESS BLOCKS IN COMBINATION WITH ORDINARY STEREOTYPES ON ROTARY PRINTING MACHINES.

No. 17,677. MARK SMITH, *Manchester Guardian* Printing Works, Blackfriars, Manchester, Lancashire.—*July*, 21, 1894.

THIS invention relates to the method of and means for printing engravings, process blocks, zincos, and the like, with ordinary stereotype matter on rotary printing machines. This can at present be accomplished only imperfectly because of the difficulty of adjusting the precise printing height of all parts of the block, which difficulty it is the object of my invention to obviate.

In preparing the forme I insert in the space to be occupied ultimately by the engraving process block, zinco, or the like, herein called the block, a type-high plain block of any suitable material. This type-high block produces in the matrix a corresponding seating.

A series of metallic plates of different dimensions, corresponding with the various sizes and thicknesses of the blocks which may possibly require to be printed, and bent to the curvature of the printing cylinder, have previously been prepared. On the back of each of these plates there is secured one or more prints, each of which will produce a corresponding hole in the stereotype.

Before the stereotype is cast, the appropriate plate is placed in the seating in the matrix prepared for it as hereinbefore described, and it is held there during the casting by the contact of the core with the prints. If the plates have to be arranged in the lower part of the matrix, no precaution to hold them before the insertion of the core is needed; but, if they are to occupy a position on the side of the matrix during casting, they may be held in place temporarily by bow springs or the like until the core is in place, when the springs may be removed.

After the matrix has been cast, the plates are removed, and it will be found that the stereo then contains, in the place of each plate, a recess or seat, the size and depth of the block to be used, and holes through which it may be secured to the stereo. For this purpose I fasten upon the back of the block, by solder or otherwise, pins or projections corresponding exactly with the before-mentioned prints on the back of the plate, and these pins or projections may be tapped for the reception of flat-headed screws by means of which the block is secured to the stereo. It will thus be evident that the block may be readily removed for the insertion of packing under it, or the reverse, when required.

Other devices than the flat-headed screws may be employed for securing the blocks in the stereo, as will be obvious.

AN IMPROVED HEAD FOR TRIPODS FOR PHOTOGRAPHIC CAMERAS OR OTHER APPARATUS.

No. 12,109. JOHN EDWARD TOUCH, Connaught Mansions, 34 Victoria-street, London, S.W.—*July* 28, 1894.

MY invention relates to an improved head for tripods for photographic cameras or other apparatus, and has for its object the construction of the tripod head in such a manner that it will fold compactly together, along with the legs, without the necessity of separating the head from the legs.

In ordinary forms of camera tripods, where the legs are permanently attached to the tripod head, the legs when folded do not lie close to each other, but are held apart by the head, which increases the bulk and makes the legs liable to be broken when travelling. If the head is made to separate from the legs for packing, it is liable to be lost, and there is also delay in erecting and folding the tripod. To avoid these disadvantages and gain compactness and less liability to injury when the tripod is folded, I construct the head of tripod as follows compactly illustrated in accompanying drawings.

The claim is: The tripod head made in pieces having their upper surfaces partly raised and partly lowered and jointed together in such a manner as to fold compactly together without being detached from the legs.

IMPROVED MEANS AND METHODS OF PRODUCING PHOTOGRAPHIC PICTURES.

No. 8615. FRANCIS FREDERIC WEEKS, 21, Thorpe-road, Forest Gate, Essex, and JOSEPH RILEY, 5, Cheapside, Bradford, Yorkshire.—*July* 28, 1894.

THE object of this, our invention, is to produce, by a combination of artistic manipulation and photographic procedure, pictures, magic-lantern slides, dissolving effects, prints, and the like, from living models, artificial figures, statuary, and the like, with all the necessary scenic surroundings required by each pictorial subject, and thereby making perfect and complete pictorial representations of ancient, existing, or original subjects, and producing and reproducing the same by the means of this invention without the aid, use, or cost of providing backgrounds, foregrounds, set pieces, and suchlike other scenic effects and "properties" as are usually provided and made use of for producing and procuring the same or similar results.

To effect and accomplish the foregoing, a plain (preferably white) background or cloth and floorcloth in continuation may be used, in front and upon which the living or artificial models are arranged and grouped according to the design, composition, and character of the subject to be represented, may require, and, should the personages of the subject be required to appear in elevated, aerial, or perilous positions or the like, we make use of sundry and certain skeleton frames, supports, and suchlike devices upon which to fix and arrange or group them, made and formed to the requirements of such positions, postures, and the like, according to the requirements or design of the subject to be represented.

After having composed our subject or picture, or the figure portions thereof, to our satisfaction, and the design of the picture or subject to be represented, we proceed to make a photographic negative thereof, by any photographic method we may think best.

The negative being made, we proceed to remedy any defects appearing thereon by the ordinary process of retouching, mending, and so forth; when this has been done, the negative so taken and amended undergoes a process which is known in the trade as being "blocked" or "blacked out," leaving the model figures visible only, untouched by the "blacking-out" process, and entirely obliterating the supports and the like. This negative is to be called "the figure negative."

From this, the said "figure negative" when completed, a photographic enlargement is made upon suitable photographic paper or other suitable material, and upon the plain portions of this, surrounding the model figures appearing thereon, we proceed to design, draw, or paint in all the required scenic representation and effects appertaining to the pictorial subject, thus making a complete pictorial representation of the subject we intend to portray, and showing the photographic representations of the model figures surrounded with the hand-drawn or painted scenic effects and required surroundings. When finished, this, the aforesaid enlargement and the hand work thereon, is photographed to produce a negative therefrom by any photographic process as may be preferred, and this the said negative, being the second negative made in, by, and for this method, is to be called "the working negative," and by and from this, the said "working negative," the copies and all required reproductions, such as magic-lantern slides or the like, are to be made and reproduced by any photographic or other process, and upon any material as may be desired or required.

This invention provides the only method by which the production and reproduction of any subject or subjects of either ancient, existing, or original pictorial or natural representations can be obtained, in which the human, zoological, allegorical, or other figure subject being represented by living or artificial models, can be made to appear (in the finished photographic pictures) as if they, the said models, were photographed whilst in the midst of and surrounded by natural or artificial scenic formations at one and the same time, but which, in fact, was not the case, the said scenic formations and suchlike surroundings really being an after-production by artistic hand work upon the photographic enlargement, made from a negative taken directly of and in which the figure models only appear.

By the use of skeleton frames and supports, pedestals and suchlike devices, for fixing up, supporting, and arranging our models or figure subjects in elevated, aerial, or any postures or positions as we may desire or the composition of our subjects may require, we avoid and entirely supersede the aid, use, and cost of providing backgrounds, foregrounds, set pieces, and suchlike scenic accessories and effects (usually made use of hitherto for procuring and effecting the production of the same or similar results, hitherto known as photographic "life model" lantern slides, or suchlike photographic productions), at a much less cost to the producer, and a more artistic and realistic character to the user than heretofore produced in use or employed for the same or similar purposes and results.

The claims are:—1. An improved process for obtaining photographic pictures, in which living figures or models are photographed against a plain background, making an enlargement of the same, and then filling in the portion surrounding the figures with representations of the desired scene, to be again photographed substantially as described. 2. An improved process for the production of photographic pictures without the usual scenic surroundings, in which a negative is taken of living figures or models against a plain or other background, the surrounding portions blocked out, leaving only the figures, and an enlargement made, the scenic surroundings being then filled in on the enlargement, to be again photographed, substantially as and for the purposes specified. 3. In a photographic process of the kind claimed above, the employment of skeleton frames or supports on which the figures are supported for the production of the first negative, the negative being then treated and the enlargement made and prepared, substantially as described. 4. The improved process for the production of photographic pictures without the use of the ordinary scenic surroundings, described in the foregoing Specification.

IMPROVEMENTS IN PHOTOGRAPHIC SHUTTER MECHANISM.

No. 17,875. CHARLES HASELER. and CHARLES EUSTACE HASELER, 94, Bridge-street West, Birmingham—*July* 28, 1894.

THIS invention relates to improvements in the mechanism by which photographic shutters are operated and refers more particularly to its combination with that class of shutter known as the "Iris" shutter.

It consists as follows:—Upon the exterior of the shutter is mounted a frame upon which is carried a sliding retaining bolt, which is acted upon by a spring, tending to draw it always in one direction. This retaining bolt further carries a pivoted latch lever, having a retaining recess in its side, and whose front end or nose is inclined or cam-fashioned. Near the one end of this bolt are provided two retaining slots (or other shape) whose function will be hereafter

explained. The said bolt is here further extended so as to afford a handle part wherewith it may be drawn or pulled backward against the spring at will.

Upon the frame and engaging with the retaining slots upon the sliding bolt is carried a pivoted primary lever, whose one end may pass into either of the two said slots, being always pressed towards them by a spring. The other end of this lever is made to engage with and be operated upon by pneumatic bellows, or it may be operated direct by the hand &c.

Again. Lying alongside of the sliding bolt aforesaid, is a part rotative bar which I will term the cam bar, and which is held in one direction by a spring. Upon this cam bar, and opposite to the end of the pivoted latch lever, is a formation which serves as a cam. This bar is operated at its one end in conjunction with the primary lever, which lies below it, as follows:—The primary lever is carried upon the one side of a vertical plate which lies at right angles to the bolt and the bar. Upon the other side of this plate is carried a spring, whose one end is fixed. In this spring is made a trigger catch, either by slot or otherwise, which engages with a stud upon the cam bar above it. When the spring is in its free condition, the said stud engages with and is held by the slot catch, but may be released by a projection upon the fore end of the primary lever, which passes through a slot in the frame plate, and impinges upon the free end of the spring, so that, when the manipulative end of the primary lever is raised, the spring is depressed and the stud released, when the cam bar is part rotated by means of its spring. At the side of this spring, and carried upon the same plate, is a compound secondary lever, whose free end is secured to the primary lever (through a slot in the plate), and is thereby raised and lowered with the said primary lever. Upon the upper edge of this secondary lever is formed a retaining tooth, which engages with a peg carried upon the cam bar, so that, when the manipulative end of the primary lever is raised or lowered, the secondary lever is likewise operated; in the latter's raised position it retains the peg, and in its lowered position it releases the same. A suitable handle piece is carried from the cam bar, by which it may be manipulated.

The operation of these parts is somewhat as follows:—The sliding bolt is drawn back until the fore end of the primary lever engages with the innermost slot, and retains it there. The cam bar is now left free to its spring's action, which presents the cam in line with the inclined shaped nose of the latch lever. In this position the shutter is closed, and its arm lies in the catch recess of the latch lever. Upon moving forward the primary lever (pneumatically or otherwise) the slide is released, and the arm carried suddenly forward (giving exposure), until the bevelled nose of the latch lever comes in contact with the cam, which latter pushes it away, and in so doing pushes it clear of the arm, when the latter is free to return to its closed position, thus rapidly giving exposure and closing in one motion of the slide. The travel of the bolt is governed by a slot in same, in which a screw is fixed, and determines its distance, and at the same time the fore end of the primary lever falls clear into the second slot in the slide.

In this operation, the cam bar is fully free to the action of its rotative spring. By rotating the said bar, however, until the stud is held back by the catch spring beneath it, the cam is held up clear of the latch lever. If we again bring the slide back into its retained position, and now again operate as before the primary lever, the shutter is shot forward, and exposure given, but, although the stud has been released and the cam bar allowed to rotate a portion of its travel, the peg in the bar is caught by the tooth upon the secondary lever, and thereby the cam is still kept back from the latch lever, and so the exposure continues as long as the primary lever is held in such position. Upon loosing the primary lever, however, the secondary lever drops clear of the peg and, the cam falls and pushes back the latch lever and thus releases the arm and closes exposure. Thus exposure may be kept to any desired length of time.

In front of the cam a locking slide is provided, so that the said cam may be locked if desired in its raised position, and thus secures the shutter in an exposed position for focussing &c., until the bolt is drawn back by hand.

A time indicator may, if desired, be mounted upon or attached to this our improved mechanism.

A modification of a portion of this arrangement may be made by substituting for the latch lever and its slide a compound lever consisting of a main portion fulcrumed to the frame, and carrying at its front end a secondary pivoted nose part, which when drawn back (against its spring) is held by a primary lever and resting also in front of the shutter arm. By now moving the primary lever the compound lever is released and the arm carried suddenly forward, giving exposure until the nose of the compound lever escapes past it, when it returns again to its closed position. This escapement occurs by reason of the arm moving in a straight line tangential to the circular movement of the compound lever.

News and Notes.

Mr. Lindsay Hemery, of Hanover Studios, Hanover-street, Rye-lane, Peckham, S.E., has issued a special trade price-list for printing, retouching, enlarging, &c. The prices appear to be moderate.

"Photographic Scraps" for September appears in a new guise. The familiar pink four pages have disappeared, and *Scraps* now takes the shape of an eight-page magazine, with a neat cover. The contents of the number include a valuable "Critical Essay on the Elimination of Hypo and Silver from Ilford P.O.P." by Messrs. Grundy and Haddon, which we shall reproduce.

A "Punch" Artist and Photography.—Mr. Linley Sambourne's first sketch appeared in *Punch* in April 1867; it was called *Pros and Cons* and represented the late John Bright tilting at the quintain. Mr. Sambourne (says *Winter's Weekly*) was studying as a youngster in an engineer's office when he began making rough sketches. A friend submitted one of his drawings to the then editor of *Punch*, which was accepted, and from that day onward Mr. Sambourne has not missed one week's contribution. "It is all nonsense to talk about 'knocking off' work," says Mr. Sambourne, "there is not so much as one stroke of the pen that does not require great care and attention. Of course photography helps me enormously, and I never deny it. There seems to be a rooted objection in the minds of some artists to acknowledge the assistance derived by it, but I frankly admit that it is invaluable to me. My camera is my pencil, and my photographs, of which I possess about 10,000, are my notes. You see I never know what my subject may be, so I have to provide myself with every imaginable model, from a weasel to a Welshman. My subjects are always selected for me as they touch upon the latest topic of the day. Then I make a rough sketch of my conception of the thing, and, if there happens to be a suitable model handy, I make use of him or her. Sometimes my wife and daughter are of great use to me in this way, otherwise I take recourse to my storehouse of subjects. Suppose I have to draw a shipwreck or earthquake at a moment's notice, my notes are ready waiting for me."

Coppering Zinc.—"In the last issue of *Process Work*," says M. Henri Calmels, in that useful monthly circular, "in the course of an article by Max Levy on 'Zinc *versus* Copper' for half-tone, I notice a few lines on the subject of coppering zinc; but, unless the reader has a good knowledge of the way to deposit copper or zinc by means of a battery, it would be very difficult for him to obtain a result from the note as given by Mr. Levy. As, according to Mr. Levy, the deposit of copper must be thin, or the work will increase in thickness, another inconvenience will occur through the unequal expansion of the two metals, for, if heat is applied, the result will be a peeling off. The deposit will adhere better if the zinc is previously brushed over with a thin paste made of Bienvenu coppering solution and washed whiting. The copper contained in the solution will combine with the zinc and give a brass surface much more adapted for receiving the copper from the bath than the bare zinc would be. The zinc, after this application, is perfectly rinsed, and is then ready to go into the bath. The formula for electro-coppering is as follows:—Water (hot), 4 pints; sulphate of copper, 1 ounce; liquid ammonia, 2 ounces; cyanide of potassium, about 3 ounces. When the copper sulphate is dissolved, the ammonia is added, and then the cyanide is gradually introduced until the blue colour has disappeared in the solution, which is finally well stirred up. The battery will be a Bunsen, about ten inches high, the jar being charged with water and sulphuric acid to make it about as sour as vinegar, and the porous cell with equal parts of water and nitric acid. A clip must be adjusted to the zinc cylinder and another to the carbon, to secure good connexion with the zinc and anode as explained below. The bath is poured into an enamelled iron vessel, and two brass rods are placed across the top of it, with indiarubber isolation to prevent contact of the vessel with the brass rods. A copper anode is suspended in the bath by copper wire affixed to one brass rod The rod holding the anode is connected with the carbon of the battery by a copper wire adjusted in the clip at one end and the other twisted round the rod, the second rod being connected in the same way with the zinc cylinder, and the zinc to be coppered being suspended in the bath by copper wire affixed to the rod connected with this cylinder. The bath will act more rapidly if warmed. As a matter of fact, for half-tone blocks obtained by the enameline process, a simple immersion in the Bienvenu coppering solution will do much better than an electro deposit. The printing surface being covered by the enameline, there is only the depth and the sides of dots and lines to protect against oxidation, and the Bienvenu self-acting solution will produce a thin film sufficient to prevent the formation of any oxide. With the deposit by battery there is a risk of thickening the work. For instance, in a plate put into the battery with the enamel left on, the protected surface will throw the deposit only in the depth of the plate and all around the work. Suppose we have a dot of $\frac{1}{8}$ inch square, around which a deposit of $\frac{1}{32}$ inch thick is made, this deposit, being on the four sides of the dot, will enlarge its surface to double size. Thus: $\frac{1}{8}$ inch dot + $\frac{1}{32}$ inch deposit on its four sides = $\frac{4}{32}$ inch—*i.e.*, $\frac{1}{8}$ inch, so that $\frac{1}{8}$ inch + $\frac{1}{8}$ = $\frac{2}{8}$, or a dot double as large as it was previously, whilst the depth is correspondingly decreased. Of course, this is a very much exaggerated effect, yet, nevertheless, it represents the proportionate thickening of any sized dot. I might say more on the subject of electro deposition, but I think the foregoing is sufficient to show your readers who may attempt the electro deposit how necessary it is to have the film very thin."

Our Editorial Table.

Mawson & Swan's Plates.

Newcastle-on-Tyne, and Soho-square, London.

With the vast experience that Messrs. Mawson & Swan have had in the manufacture of dry plates of the highest quality, if this firm cannot supply the requirements of even the most fastidious, one may well ask, "Who can?"

When trying some specimens of their productions recently received from them, the "Castle" and the "Mawson" brands, on comparing the results obtained, we were constrained to say with the Captain, in the *Beggar's Opera*:—

> "How happy could I be with either,
> Were t'other dear charmer away!"

And this, notwithstanding that the "Mawson" possesses a slight superiority over its *confrère* as regards sensitiveness. Both gave rich round images, full of detail and vigour; nothing to choose between them in these respects, although, as we have said, one is rather more sensitive than the other, a feature of great value in the portrait

gallery, especially when babies or restless children are the subjects of the artist's skill, or even, as we have had occasion to prove, when a couple of young frolicsome dogs were desired to be transferred to the album of a lady. Notwithstanding this, we would not for an instant hesitate to stock a camera with the slower, even for snap-shots, in the certainty of getting good returns.

The Mawson Lantern Plate is quite as good for its special purpose as the others referred to are for theirs, and higher praise than this we cannot bestow. There is no heaviness or smudginess in the shadows, the whites are pure, and the gradation or half-tone truly excellent. We may add that, neither in the case of the negative or the transparency plates, was there any puckering or frilling apparent.

Convention Views in Ireland.

By F. A. Bridge.

Mr. Bridge sends us a few choice photographs taken by him when at the Convention. They comprise some exquisite interior views taken in the Dublin Museum and in the Drawing-room and Hall, Powerscourt. The Baptistry, Mellifont Abbey, is a beautifully executed example of those ecclesiastical archæological remains for the possession of which Ireland is so justly noted. *Patience on a Monument waiting for a Shot* is represented by a huge boulder, with Mr. Welford, camera in hand, perched on the top thereof, waiting for his prey.

From Mr. William Tylar, Birmingham, we have received a specimen of his matt pulp slabs on which to lay down prints for subsequent stripping. Although the specimen is too small to permit us to put it to a practical test, yet are we certain, from our experience with other surfaces, that it will answer its intended purpose. Of course, it, like glass or ferrotype plates, must receive an application of French chalk previous to laying down the print. Mr. Tylar also sends a card exposure meter which should prove useful to beginners.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
3	North Middlesex	Discussion on Mr. Mummery's *Mounting and Framing* Paper.
3	Peterborough	
3	Putney	
3	South London	*Mounting and Framing up.* W. F. Slater.
3	Stereoscopic Club	
4	Birmingham Photo. Society	
4	Brixton and Clapham	
4	Exeter	
4	Hackney	Open Night.
4	Herefordshire	
4	Lewes	
4	North London	
4	Oxford Photo. Society	
4	Paisley	
4	Rotherham	
4	Sheffield Photo. Society	*'Mong Derbyshire Hills and Dales.* Mr. Draper.
4	West London	
4	York	
5	Leytonstone	
5	Photographic Club	
5	Southport	
5	Southsea	
6	Birmingham Photo. Society	
6	Glossop Dale	
6	Hull	
6	Leeds Photo. Society	*The Use of the Lantern as an Educational Instrument.* Washington Teasdale.
6	London and Provincial	
6	Oldham	
6	Tunbridge Wells	
7	Brighton and Sussex	
7	Cardiff	
7	Central Photographic Club	
7	Croydon Microscopical	
7	Holborn	
7	Leamington	
7	Maidstone	
7	North Kent	
8	Croydon Microscopical	Excursion: Limpsfield, Kent Hatch, Squerries, and Westerham.
8	Hackney	Excursion: Waltham Abbey. Leader, F. W. Gosling.
8	Hull	
8	Liverpool Amateur	Excursion: Speke and Hale.
8	South London	Excursion: Theydon Bois. Leader, H. E. Farmer.

Royal Photographic Society of Great Britain.

August 28,—Technical Meeting,—Mr. Andrew Pringle, F.R.M.S. (Vice President), in the chair.

Being the first meeting of the Society since the Queen commanded that in future it should be known as the Royal Photographic Society of Great Britain, the Chairman made a few observations in reference to the change of title. He said that it was a matter for extreme congratulation that photography had thus been officially acknowledged. He thought the change entailed increased duties and responsibilities upon them as members.

The Chairman's remarks were received with applause.

The evening was occupied by a discussion on *Limelight Matters*, opened by Mr. R. R. Beard. To this we shall return next week.

London and Provincial Photographic Association.

August 23, 1894.—Mr. W. H. Prestwich in the chair.

Mr. W. H. Barnes exhibited the "Tyke" dark-room lamp.

Toning after Fixing.

Mr. A. L. Henderson demonstrated his process of toning after fixing, introducing the subject by remarking that a great range of colour was obtainable by it. He showed a number of prints that had been sent him by Mr. A. J. Brown, Mr. Cowan, and Mr. Cobb, on gelatine and collodion papers, the halves of which he had toned, whilst the other halves had been simply fixed. He had observed that the more gelatine there was on the paper the quicker it toned If the prints were too deeply printed, they could, after fixation, and before toning, be reduced by means of ferridcyanide and hypo. He drew attention to the whites of some sulphur-toned prints, which were perfectly pure. The toning of some fixed prints was then proceeded with, Mr. Henderson remarking, that the bath he employed was acid. It consisted of:—

Ammonium sulphocyanide	100 grains.
"A feeble acid" solution	200 minims.
Water	10 ounces.

Asked what the "feeble acid" was, Mr. Henderson declined to say, preferring to leave it to individual experimenters to find out. To the above solution about a drachm of a solution of gold, three grains to the drachm, was added. Mr. Henderson pointed out that by this method of toning, after immersion in hypo was dispensed with, and thus loss or alteration of tone was prevented. Besides, by stopping at the proper time, almost any tone desired could be obtained. The tones, again, did not alter in the drying.

So far as could be observed in the gaslight, the prints toned to a pleasing warm tone. It being remarked that the collodio-chloride print took some time to tone.

Mr. W. E. Debenham remarked that one could not develop collodio-bromide films unless they were first soaked in alcohol.

Mr. Henderson said that a feature of the original sel d'or toning bath was its slowness, and that was because the print took some time to fix in it.

Mr. Debenham said that prints could not be fixed in a three-grain solution of sel d'or; they had to be fixed after treatment with the sel d'or.

The various prints toned by Mr. Henderson's method, as well as other prints, were then subjected to treatment with a solution of ferricyanide and hypo. They appeared to be all more or less reduced, the collodion prints resisting the action of the solution best of all. This, it was pointed out, was probably a function of the collodion.

Albumen Printing *versus* Gelatino-chloride.

The Chairman remarked that he would like to have seen the experiments made with albumen prints. In his opinion, albumen paper was not played out. Gelatine prints always had a more or less yellow tint, which was objectionable, and which was absent from collodion and albumen. He found that, as time went on, the yellowness increased. It would, he thought, be a great advantage if gold toning could be dispensed with.

Mr. W. Cobb endorsed the Chairman's view that the albumen process was not yet played out.

Mr. J. S. Teape showed an albumen print made on June 11, 1888, which had been fixed and not toned. It had not faded in the least. He had printed it so deeply that little of the image was perceptible; it was then placed in clean hypo, and reduced to the required depth by being left in for two hours, taken out, and washed.

The print was much admired for its pleasing tone.

The Chairman said he thought that a process of toning after fixing would be commercially advantageous. His experience was that a very large quantity of gold was necessary for gelatine printing.

Mr. J. E. Hodd had found by experiment that one brand of gelatino-chloride paper took a grain of gold to twelve quarter-plate prints, whereas another brand took up less than half that quantity. He used the sulphocyanide bath in both cases. His prints were of average depth.

Mr. Debenham thought it possibly advantageous to have a paper which took up a lot of gold. He did not find so much gold was necessary with the paper named by Mr. Hodd.

Mr. Cobb could not understand why the use of alum was insisted on with gelatine paper. He never used it himself, and saw no advantage in it.

The Chairman, in concluding the discussion, said photographers would not grudge the greater quantity of gold required with gelatine paper if they could get greater permanency.

Photographic Club.

August 22,—Mr. W. H. Barnes showed a lamp for the dark room called the "Tyke." The special feature was that it had a roller blind in two sections—ruby and canary fabric. Red, white, or yellow light could be had at will.

The CHAIRMAN read a letter from Professor Stebbing concerning the document alleged to be by Daguerre. He said that he had not been able to compare the copy sent with an original document. He sent to the Club a copy of a document presented by the Mayor of Bry-sur-Marne to the Photographic Society of France, that it might be compared.

Mr. HOA showed some photo-mechanical prints by a new process. The advantage was claimed that there was a truer photographic effect. 400,000 copies had been made from one block by a customer of his.

Mr. NAEGELI showed some prints from negatives taken a few weeks since in the neighbourhood of Haslemere.

North Middlesex Photographic Society.—The second of the new series of Instruction Evenings was held on Monday, the 20th inst., when Mr. W. E. DEBENHAM demonstrated *Intensification and Reduction*. In his introduction he said that it was sometimes assumed that we ought to get what intensity we want in our negative with the developer in the dark room, and that no intensified result was so good as if the requisite intensity were obtained direct by development. He, however, dissented from this view, and maintained that, in some cases, better results could be got by intensifying a thin negative than by taking the same plate to a sufficient density at once. He reviewed the various well-known methods of intensification, pointing out the leading characteristics of each, and proceeded to demonstrate the mercury and Schlippe's salt method, for which he owned to a preference. The first essential is that the negative be thoroughly fixed and as thoroughly washed, to thoroughly free the plate from silver in those parts where there is no image. Then take some saturated solution of bichloride of mercury, and put into it a few crystals of iodide of potassium. This will throw down a precipitate like sealing-wax, but the addition of another crystal or two suddenly clears it. This is then poured over the negative, which should have been previously soaked in water, and the intensification proceeds. When enough density has been obtained, thoroughly wash, and flow over it a five grain to the ounce solution of Schlippe's salt, which turns the image to a brown colour, and it is then again washed, dried, and printed from. He then proceeded to reduction by both the chloride of lime and Howard Farmer methods, reducing the two halves of one negative by the different means, with, as far as could be judged, identical results, the Farmer method, however, giving a much yellower negative. The Howard Farmer formula is so well known that it need not be repeated. The chloride of lime method is as follows:—Chloride of lime (the common oil-shop variety), ½ pound, in water, 80 ounces; shake well and filter; add 10 ounces washing soda; shake well and filter again; flood your plate with the solution, and wash when sufficiently reduced.

Kilmarnock and Ayrshire Photographic Society.—An outdoor meeting of this Society wae held at Dalrymple on Saturday. There was a good attendance, several ladies being also present. The day being most suitable for photography, excellent photographs of views on the estates of Miss Cathcart and Mr. Coates were obtained. The following were admittted members:—Miss Ida Gordon (Fairfield, Monkton), Mrs. Arthur (Fullarton House, Troon), Mr. John Macintosh (Strath Cottage, Galston).

Northern Tasmanian Camera Club.—July 18, the Rev. A. H. Champion, M.A. (President), occupying the chair.—The HONORARY SECRETARY and TREASURER (Mr. John Sparrow) read the annual report, which stated that the present number of members on the roll was thirty-nine, of whom twenty-two resided at Launceston and seventeen in the country. The new club-room in which meetings are now held had been found very suitable, and arrangements for practical work in developing, &c., were complete. The competitions held during the year had not been contributed to as well as usual, and the conclusion was that too many had been arranged, there being twelve in the programme for the year. Lantern meetings had enjoyed the largest share of attendance, and the new Stock's lanterns imported by some of the members had strengthened the interest felt by members in slide-making. Two Social Evenings had been given during the year, one in the Milton Hall, the other in the Masonic Hall. Both were largely attended and highly appreciated. The attendance on the evenings devoted to demonstrations and the reading of papers had been satisfactory. The HON. LIBRARIAN (Mr. F. Styant-Browne) reported that the books, &c., had been in fair demand during the year. There had been a number of volumes bound, and the library was now very complete for reference. Members were urged to take out the books, &c., more freely, as they would be found very helpful in many ways. The following office-bearers were elected for the ensuing year:—*President:* Mr. R. C. Kermode.—*Vice-Presidents:* Messrs. William Aikenhead, R. Lewis Parker, and John Sparrow.—*Committee:* Rev. A. H. Champion, M.A., Messrs. W. H. Twelvetrees, and F. C. Birchall.—*Secretary, Treasurer, and Librarian:* Mr. F. Styant-Browne.

FORTHCOMING EXHIBITIONS.

1894.	
Sept. 11–Oct. 6	*Royal Aquarium.
,, 17–21	*Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	*Royal Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
1894.	
November 20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1	*Stanley Show (Photographic Section).
,, 29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December.....	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

DEVELOPMENT OF GELATINO-CHLORIDE PRINTS.

To the EDITOR.

SIR,—In the course of a few experiments on the developing of gelatino-chloride partly printed proofs I have found a solution of tannic acid, or tannin, with the addition of a small amount of acidified pyro as accelerator, prove an easily used and yet powerful developer for Solio paper.

If the printing be carried on until half the required depth is obtained, the addition of pyro is not necessary, and is, in fact, unadvisable. I do not weigh the tannin, but measure out a small quantity dry, about as much as would stand on a threepenny bit, to one ounce of water. I keep pyro in ten per cent. solution, acidified with nitric acid, and if the print be very much underdone, only faint traces of the shadows being visible, I add five minims (or half a grain) of pyro to the ounce of tannin solution, when full strength is easily obtained. The print should be well washed and toned in the combined or separate toning and fixing baths.

If tannin alone is used, a very small quantity of bichromate of ammonia or potash may be added to the developer, as recommended by the Zenotype Company for their preparation, when a slight variation in tone may be obtained. I prefer, however, to do without this, and I have found the tannin and pyro developer suitable for all ordinary purposes; in fact, I have made an enlargement by daylight from quarter-plate to 10×8, using stop *f*-8, exposing for the whole of one day on Solio paper, with a very satisfactory result when developed by tannin and pyro.—I am, yours, &c.,

W. RIDLER.

Stroud, Gloucestershire, August 27, 1894.

P.S.—The prints must be immersed in the developer without any previous treatment.

CARBON PRINTING.

To the EDITOR.

SIR,—Is it not strange that the makers of carbon tissue do not supply glass plates coated with the bichromated gelatine, so that those who wish to use this process for transparency work might be saved all the trouble and mess connected with preparing the plates? They supply transfer paper—why not transfer glass plates?

The trouble and difficulties of coating the glass are, I am sure, a grea barrier to many amateurs using this process, which has so many advantages over ordinary transparency plates.

August 27, 1894. AN AMATEUR CARBON WORKER.

THE PROTECTION OF TRADE MARKS IN GERMANY.

To the EDITOR.

SIR,—A new law for the Registration and Protection of Trade Marks has been promulgated in Germany, and comes into force on October 1 next. This law in its main provisions as to what constitutes a trade mark and is registerable as such, conforms very nearly to the Trade Mark section of the English Patent Law of 1883. It also embodies provisions analogous to some in the Merchandise Marks Act of 1887, which traders who send goods into Germany would do well to make themselves acquainted with. Any person who knowingly or through gross carelessness applies the name or firm of another party, or a registered trade mark, is liable for damages, and further to a heavy fine or to six months' imprisonment. Any one who wrongfully applies a state coat of arms of a district, or of a municipal or corporate body, for the purpose of creating confusion regarding the nature or value of the goods, or any person who offers for sale goods bearing such marks, will be punishable by fine or imprisonment. Foreign products which wrongfully bear the name and locality of a German firm or a registered trade mark, on entering Germany as imports, or for transit, are liable to seizure by the Custom-house authorities and confiscation. When an illegal mark on

the goods cannot be removed, the goods may be destroyed. Where German goods must bear a certain mark or signification on being imported into a foreign country, to indicate that they are of German origin, or if such goods are not so favourably treated at the Custom house in respect of the trade marks, as the goods of other countries, the Federal Council is empowered to subject goods imported into Germany from such foreign countries to the same restrictions, and in case of violation thereof to seize and confiscate the goods. All trade marks at present registered in Germany must be re-registered under the new law within the next four years, *i.e.*, before October 1, 1898; there is no necessity, however, for any immediate action on the part of the proprietors of such marks, but at the same time no advantage is gained by postponing it.—We are, yours, &c., W. P. THOMPSON & Co.

6 *Bank-street, Manchester, August* 21, 1894.

PROFESSIONAL AND AMATEUR GRIEVANCES.

To the EDITOR.

SIR,—With all due respect to Mr. Chadwick, I beg to differ. The grievance is not imaginary, but of course it is not expected that dealers, who are the only ones that benefit, should sympathise with us. I am not going so far as to say there are no amateurs that benefit us, knowing myself many genuine gentlemen amateurs in the true sense of the word; my complaint is against the individual who is either a paid servant in quite a different line or is trading on his own account, possibly as a shoemaker. Now, whilst admitting the right of any man to trade in rags and bones, if he so minds, I fail to see the justice in his supplying (because he is not dependent upon it), for an instance, whole-plate pictures at 10*s.* 6*d.* per dozen. Neither, to my mind, is it commonly fair for *any* outsider to be able to obtain from trade enlargers the same terms as a professional photographer: were it possible for a firm of amateur plate makers and dealers to start and supply goods at even twenty-five per cent. less than present prices, how soon we should know of a dealer's grievance! The shoe pinches those who wear it, Mr. Chadwick, and they only can estimate its annoyance. I would also point out that it is not the old positive torment who is now travelling the country; few there are of them still, but in almost every district now are to be found men capable of, and who *are* turning out, work equal to any and superior to much that is done by studio operators, and why? Because our dear friend Amateur, thanks to dry plates, blossoms quickly into a full-blown operator at 25*s.* per week, and the more genuine man in disgust seeks the open field. Soon the established photographer will know they are about and possibly admit there is a grievance; soon, also, plate-makers and dealers will admit there is power in the rank and file. Step forward, Mr. Field, with your suggestions for union. I think you will find more now to support it; for one, at least, count on—Yours, &c., ITINERANT.

Basingstoke, August 27.

To the EDITOR.

SIR,—In regard to the vexed question of amateurs *versus* professionals, I do not think much good will come out of it; however, the ill of one does not cure that of the other. It may interest you to know that on this side we do not fare any better than you. We find here millionaires more stingy than ordinary business people. Not long ago a very rich man told me that an amateur friend would take his electric light plant for nothing, while I charged 16*s.* for a 10 × 12 view. Another party asked my price for different views of buildings and instantaneous ones of animals. My terms were found to be excessive, and he got an amateur to make for him 300 negatives of sizes 5 × 7 inches and 8 × 10 inches, indifferently, or 600 francs the whole 300, or 24*l.* How is that for cheapness?

Now, as to a letter from a party having developed different objects on his plate which were not in the view when taken, I can recall having once read in an American photographic periodical an instance where a gentleman developed, on some views taken in California, on plates made in New York, some Japan views, at least they were thought to be such. It was at that time also stated that the thing could be reproduced at will, and the plates used by the manufacturer were thought to have been cleaned ones, and not new ones. The way to make this showing of old views on a newly coated plate were given, as far as I can recollect, as follows:—Coating a well-cleaned plate with collodion and exposing on a certain subject the plate was developed, &c. When dry, it was exposed to the full sun or strong light (as the case may happen with any negative unintentionally) for a day or several days, face up of course; after that, the plate may be cleaned off as well as usual or possible, recoated and re-exposed, developed as before, and whatever the second subject may have been the first one will reappear faintly on it upon development. In how far this is true I am unable to say, having made no trial of it; but I am sure of having read it in that way in a photographic journal. If at all correct, it may very well answer for some of the famous ghost pictures, and nobody be the wiser how the ghost came to be on it, and no cheating to be detected. If this may interest your readers, you are welcome to its use; any how some may try it.—I am yours, &c. A. LEVY.

Asnières, August 21, 1894.

[This correspondence here terminates.—ED.]

A MYSTERIOUS NEGATIVE.

To the EDITOR.

SIR,—Referring to my letter on p. 527, it may be of interest to point out that, if the theory of previous exposure be correct, as suggested in your last issue, the plate in question must have been exposed twice previous to the one I made. If you, sir, still have the negative, you will see that the old-fashioned hat is supported by the child's dress, and that there is no appearance of the dress or of the child on or above the hat, or of any one wearing the hat.

It would ill become me to speak disrespectfully of ghosts.—I may be one myself some day—and must therefore leave it an open question as to whether they go about in hats, but without heads, and in short dresses, but I cannot see how the result shown could have been obtained short of purposely working for it.

There are, in all, three images on the plate, none having any connexion with the other. It was put in the dark slide direct from the box, as packed by the maker, but a few minutes before using.—I am, yours, &c.,

Duffield, Derby, August 25 1894. W. R. BLAND.

To the EDITOR.

SIR,—I have been much interested in the letters that have appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY upon the above subject, and now venture to offer my opinion as to the cause of the mysterious appearances referred to, which is this: I believe that the plates referred to must have been previously exposed upon the mysterious subjects (referred to by your correspondents) *for a lark* by one of the *employés* of the dry-plate manufactory, and then packed up with other plates for sale in the usual manner. It could be easily done, and so long as the *employé* kept the matter to himself or herself (as the case may be) it would take a long time probably to bring it home to the right party, if indeed it could be done.

The previously used glass theory of Mr. F. E. Jones does not account for the appearances, in my opinion, because I understand only new glass is used by dry-plate manufacturers of the present day, and that is coated with a substratum coating previous to the sensitive emulsion being applied. The so-called spirit photography does not account for the appearances mentioned, because they do not resemble the human figure, and, even if they did, they might only be made up for the purpose by the party who exposed the plate previous to its having been put into the box for sale.

It would be interesting to know, however, if the two images (*i.e.*, one on top of the other) are visible upon the negatives when viewed by transmitted light, as would be the case if one plate had been *accidentally exposed* upon, say, two different landscapes, or other subjects by the photographer himself. In such a case he would be sure to recollect the circumstances respecting the exposures, &c.; if not, these appearances are still a mystery to—Yours, &c., J. T. HACKETT.

The Victoria Studio, Albert-street, Fleet, Hants, August 27, 1894.

P.S.—I had a mysterious appearance upon a negative on an Ilford ordinary plate I took with the magnesium flashlight last winter, but am quite unable to indicate what caused it, only I know that it had not been previously exposed by me, or any one in my place. J. T. H.

To the EDITOR.

SIR,—Years ago I had some negatives that showed, by reflected light, a faint trace of printed matter; but, as there was no appearance by transmitted, and the printing quality was not affected, no trouble was taken to find out the cause. Nothing had been done by me to account for the phenomenon, but possibly at the factory the plates had been laid face down on an old newspaper. That was my conjecture.—I am, yours, &c., F. T. QUICK.

Eltham, August 24, 1894.

BOROUGH OF SOUTH SHIELDS ART CLUB.—The Third Annual Exhibition of this Club will be held in the Public Library Hall, Ocean-road, from October 3 to 20, 1894. It is intended to have, in connexion with the Exhibition, a Photographic Section, and for which silver and bronze medals will be awarded. The Photographic Section is confined to residents of the boroughs of South and North Shields and Jarrow, and will be divided into the following classes:—Class A, Landscapes or Seascapes, with or without figures, any size; Class B, *Genre* and Figure Studies, any size; Class C, Portraiture, any size. Open to amateurs only. Silver and bronze medals will be awarded in each class, but the Judges shall have the right to withhold any medal on the ground of insufficient merit, and their decision in all cases shall be final. Class D, open to professionals for exhibition only. No charge will be made for wall space. The Hon. Secretary is Mr. R. Kirton Robson, Art Club, Commercial Chambers, 72, King-street, South Shields.

Answers to Correspondents.

STEPHEN J. C. LEKE.—Thanks.

J. A. TAYLOR.—The old book does not possess any special value. We recently purchased a copy for sixpence at a second-hand book shop.

H. J. SARNEY.—We cannot identify the painting from the description given; but, if the artist is dead, you can copyright your photograph of the picture.

P. C. S.—Paris will be sufficiently north or north-east for your purpose. Try *L'Amateur Photographe*, Rédaction et Administration, 21, Boulevard St. Germain, Paris.

RUDDER GRANGE, Augustus W. Wilson, and others, who write *re* "A Call to Arms," are thanked for their communications. We have, however, closed the correspondence.

SYNTAX.—If the enamel collodion cracks and splits off the plate as described, add a drop or two more castor oil per ounce. Evidently a very horny and contractile pyroxyline was employed.

ALBERT LEVY (Asnières).—The flare spot given with the single lens can be obviated by altering the position of the stop to a little nearer or farther from the lens, as may be determined by experiment.

F. W. BURFORD.—The last we purchased we obtained from Crease, Cow Cross-street. But amber, or pale copal, for stoving, will do as well, and that may be had from all varnish-manfacturers.

H. C. LEAKE.—1 and 2. The device seems to us to possess sufficient novelty to warrant its being patented; but (3) we are decidedly of opinion it would not in any measure be worth the expense of doing so.

B. NICKOLLS.—If the lens is a portrait lens, and a good one, of course it would be useful in the studio. The maker used to be in good repute. We do not value apparatus, and if we did we could not do so without seeing it.

W. WARD.—We expect the stains, caused by the rain getting into the frames and sticking the sensitive paper to the negatives, cannot be successfully removed so as not to show in the prints. Try a weak solution of cyanide of potassium.

R. S. (Banbury).—We should say that, for general out-door work, a whole plate, and a twelve by ten camera, would be more useful to a professional than a seven by five and a ten by eight. Lenses of the "rapid" type certainly.

J. E. GUBBINS.—We fear, as the negative was exposed to light before it was fixed, there is no remedy. The stain may be changed in colour, but we know of no method by which it can be removed so as not to show strongly in the prints.

HADJI.—1. A solution of cyanide of potassium in which a *small* crystal of iodine has been dissolved, forms an excellent clearing solution for wet plates. Try the solution experimentally first. 2. Liver of sulphur is sulphide of potassium.

S. T. (RYDE).—Screens copied from paper prints are seldom employed by our best workers now. They use screens ruled direct upon glass, and the results are therefore superior. The ruled sheets supplied by the house mentioned are as good as any of that kind in the market.

ENAMEL.—Send us some of the pictures to see; we can then form an opinion as to how they are produced, and this we cannot do from your description. Are you aware that collodion and gelatine will not mix and form a solution? Probably the pictures are ordinary "enamelled" prints.

C. C. H.—Most of the photographic engravers abroad, who work the etching method, make their own tissues, and do not say how they make them. The Autotype Company make special tissues that are excellent for the purpose. Particulars for sensitising them are supplied, but we question whether full instructions are given with them for producing the engraved plates.

J. EDWARDS.—Leather rollers are used for lithography and photo-lithography. Gelatine roller composition is composed of gelatine and treacle or gelatine and glycerine. It will be cheaper to purchase this than trouble to make it in small quantities. It may be had from any printers'-material dealers, in different degrees of hardness, to suit the purposes for which it is required.

AN ASSISTANT (Riding Mile).—1. Use a stronger solution of bromide of potassium. 2. Pin them flat on a board till dry. 3. Not worth the trouble. 4. Sulphate of iron, but scarcely worth the trouble. 5. There is a trace of gold in the fixing bath from prints. That and the silver will be precipitated by sulphide of potassium. 6. Same as 5. 7. The residues should be kept separate.

GRANITE.—As you do not say how the paper was prepared, for sensitising which the bath had previously been used, or how the latter was made, it is impossible to say of what the solid matter consists without making an analysis. This our time will not permit of. We may, however, say that there is nothing in the appearance of the stuff to indicate that adulterated nitrate of silver was employed in making the bath in the first instance.

J. R. G. asks: "Can you inform me where I should be likely to obtain coloured sheets of gelatine, suitable for producing effects with the limelight for theatrical purposes? I have tried coloured glass, but find several of the required colours much too dense, and I am informed that the gelatine films are much more transparent."—The coloured gelatine can, we believe, be obtained of Cornellissen, Great Queen-street, London, W.C.

A. H. W. says: "I have some negatives which are badly frilled—some nearly half across the plate. I tried a quarter per cent. solution of commercial ferric chloride, as mentioned in an article in your valuable paper of August 17, but could see no improvement from the immersion. Can you help me out of my difficulty?"—In reply: Consult the JOURNALS of May 5 and 12, 1893, where several methods of stripping and replacing negatives are given.

CHAS. E. HANCOCK.—The thickness of the crown lenses at the edge will not in any manner interfere with the effectiveness of their working; nay, this may possibly improve it, for thickness of the glass is frequently an important element in good correction. We strongly advise you to leave this as it now exists. See that the edges are well blacked before placing them in the cell. A direct central ray should be brought to a focus at a shorter distance from the lens than an oblique ray. Were it otherwise, the field would not be flat.

C. J. GREGSON writes: "1. Can a photographer have any picture he takes copyrighted without permission of the sitter? 2. Does a copyright belong to the operator or his employer, produced in employers' time? 3. Can sitters demand negatives of themselves?"—In reply: If the photographer is paid for taking the portrait, he cannot make it copyright. 2. The copyright is vested in the author of the work. 3. No; except under special arrangement. If a charge is made for taking the negative, it becomes the property of the one for whom it was taken.

F. O. G.—As a rule, it will be found more economical to obtain the current from the mains than to instal plant for generating the electricity for portraiture in the studio. Of course, if the charge made by the Company is very exorbitant, the case may be different. Dynamos, and also gas engines, are very much cheaper than they were a few years ago, it is true, but still the outlay will be great. Get one or two old-established firms to quote you for a suitable installation with or without the gas engine. Gas being so cheap in your neighbourhood is a consideration.

T. WITWELL says: "The other day I developed a dozen negatives I took at Antwerp on strange (to me) plates, and they have all turned out very much denser than I expected they would; indeed, they are so dense that I can scarcely print through them. Will you please tell me the safest way to reduce them, as I do not wish to risk losing any of them, as they cannot be taken again?"—Use Howard Farmer's reducer as given in the ALMANAC; but, if you are not familiar with its working, it will be advisable to dilute it with two or three parts of water and allow a longer time for its action.

AN AMATEUR says: "There is a meeting-house or church here which I would like to photograph, but the distance is so short to get away from it (about twenty-six feet) that the lens I have will not do. Kindly tell me what kind of a short-distance lens (for full-plate) will do."—Obtain a whole-plate wide-angle lens of the rectilinear or symmetrical type. It will have an equivalent focus of from five to five and a half inches. That is the shortest-focus lens that will cover the whole plate. Whether that will include in the picture all that is desired, we cannot say, as the size of the building is not stated.

ARTIST writes: "1. A photographer gets an idea for a picture from a scene described in a copyright literary work; when he has made the photograph, he registers it. Some weeks after, another photographer reads the poem, and thinks he too would like to illustrate the same scene by photography. He in no way copies the first photographer's work, but makes a photograph which he thinks represents the scene described. Would the first photographer have any ground to proceed against the man who made the second photograph? 2. Could the 'owner of the copyright of the poem' have given the first photographer the *sole* right of making photographs to illustrate the scene described in the poem?"—1. No, unless the second photograph was a copy, or colourable imitation, of the first. 2. We don't see how he could.

R. E. S. C. says: "1. During a recent tour I exposed a number of plates of two brands (No. 1 and No. 2). I developed both brands in pyro-soda and hydroquinone according to subject. On Saturday, the 18th inst., the negatives were all right. On Monday, the 20th inst., the plates were not yet dry, but still appeared all right. On Thursday, the 23rd inst., most of them were dry, but No. 1 brand had become spotted with very few exceptions, as enclosed specimens. Very few of No. 2 brand show any fault; the one sent is the worst, though all of them were not dry. Air had full access to the plates throughout the drying, and they were not subjected to a temperature over 65° or 70° Fahr. No alum bath was used, as the makers of No. 1 brand, which I generally use, advised me against it. Is this the fault of the plates, or am I to blame? And, in case of the former, would it be likely that they would replace or refund the money, nearly all my plates—some six dozen in all—being spoilt, except those of No. 2 brand? 2. There is an idea abroad that the new Jena glass may not keep. Can you tell me the longest time a lens made of similar glass to this (Goerz anastigmat) has been in use under ordinary care without deteriorating?"—1. The plates seem to have taken an abnormally long time to dry, during which in all probability decomposition of the gelatine set up and produced the markings. We do not for a moment think the plates are at fault, but should imagine that you attempted to dry them in an exceedingly humid atmosphere. The fact of two distinct brands behaving in this remarkable manner should suffice to convince you that the plates can scarcely be to blame, and you can therefore hardly expect the makers to replace them. 2. Lenses containing Jena glass have, we believe, been made as long as six or seven years without deteriorating. There are considerably over a 100 varieties of Jena glass.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1792. Vol. XLI.—SEPTEMBER 7, 1894.

OUR FORTHCOMING ALMANAC.

We have entered upon the preparation of the British Journal Photographic Almanac for 1895, and, as in past years, we shall be pleased to receive short contributions on practical subjects for its pages from those of our readers who may desire to record the results of their experiences and experiments. Not only do we hope that all those of our older friends, who for many years have kindly responded to our invitation, will once more find a place in the pages of the Almanac, but we express a wish that the constantly increasing number of our younger readers will also consider the invitation open to them.

It will be an additional pleasure to us if intending contributors will forward their articles at as early a date as possible in order to avert the chance of their being omitted through lateness of arrival.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, if they have not already done so, will oblige us by at once forwarding lists of officers and other details for inclusion in the directory of Photographic Societies, in order that the list may be made complete.

The Publishers desire us to remind intending advertisers that the announcement pages of the Almanac are rapidly filling up, and that, to ensure insertion and good positions, orders and copy should reach them without delay.

SEL-D'OR AND SEL-D'OR TONING.

While the battle of the different systems of toning silver prints is still being waged, any mistaken notions as to terms and conditions should not be allowed to take root, or they may ultimately become accepted as established facts. Last week the difference between the old combined toning and fixing solution of thirty of forty years ago and the one now being advocated by some was pointed out, as was the difference between the modern emulsion papers and those in vogue at the time referred to; also, that any deductions drawn from the stability, or the fugitiveness, of the prints of old could not be accepted as applying to the modern papers and present system of combined toning and fixing. It is necessary to emphasise this, as many of the younger photographers seem to imagine that conditions existing in the old bath and papers are identical with those in the new papers and the present combined bath.

There is another misconceived idea that seems to be prevalent just now, and it is that the sel-d'or, or toning bath, and the old compound toning and fixing bath, are one and the same thing. At a recent meeting of one of the London Societies, for example, during a discussion on toning systems, one of the members is reported to have said that "a feature of the original sel-d'or toning bath was its slowness, and that was because the print took some time to fix in it." As a matter of fact, the sel-d'or bath was very quick in its action. Plain paper prints used to be toned in two or three minutes, and albumenised in about ten minutes, but no length of immersion in the toning solution would fix them; that had to be done afterwards. There was really the same difference between the sel-d'or system of toning and that with the combined bath as there is now with the sulphocyanide system and the present combined bath; the toning and fixing in each case are separate operations. It is not long ago that one of our contemporaries, in an editorial article, fell into the error of confounding the old compound bath with the sel-d'or one.

Sel-d'or—salt of gold—is a double salt of hyposulphite of gold and soda, and crystallises in fine needlelike crystals. In this form it used to be an article of commerce, and was put up in fifteen-grain tubes or bottles, the same as the chloride. It was first introduced by Fizeau for toning or gilding the Daguerreotype image. The favourite brand among Daguerreotypists was that of Fordos & Gellis, a French firm. As the commercial salt was expensive, and sometimes adulterated, operators often preferred to make their own. This they usually did as follows: Eight grains of chloride of gold were dissolved in sixteen ounces of water, and thirty-two grains of hyposulphite of soda in four ounces of water; the former solution was then gradually added to the latter, it being well stirred the while. After the Daguerreotype had been fixed, a little of the solution was poured upon the plate and heat applied. By this treatment the image was much improved and rendered permanent

Sel-d'or was afterwards used for toning paper prints, and this was the procedure with them: Either a solution of the commercial salt, acidified, was employed, or, as was more generally the case, the bath was made as follows:—

Hyposulphite of soda	12 grains.
Water	8 ounces.
Chloride of gold	4 grains.
Water	8 ounces.

The two solutions were then mixed by pouring the gold one

into that of the hypo with vigorous stirring. If the chloride of gold used was neutral, which seldom happened, about ten or fifteen minims of hydrochloric acid were added after the mixture was made. In this bath plain salted paper prints toned in a couple of minutes or so. Albumen prints took longer, generally ten to fifteen minutes, according as the gold became exhausted. It will be seen from the formula that the sel-d'or bath is quite incapable of fixing, as well as toning, the pictures. There is a certain degree of analogy between this bath and the sulphocyanide toning bath as at present used, and one might as well expect that to fix the prints as well as tone them as the former. The fixing was, of course, a necessarily separate operation, the same as with the present sulphocyanide bath.

The solution of hypo employed for the fixing was of about the same strength as that now used, one part of the salt to six of water; but the time of immersion then considered necessary was longer than that now given—nearly double. At one time it was surmised that sel-d'or would yield more permanent results than the compound toning and fixing bath, because the solution failed to tone when the gold was exhausted, while the combined bath frequently toned long after that condition was reached; but this idea was not confirmed by time, and, moreover, it had a tendency to yellow the whites when used for albumen printing. The sel-d'or method of toning, it may be mentioned, practically became obsolete long before the alkaline system was introduced.

The reason for this article is that a great confusion of ideas clearly exists in many quarters as to the different methods and conditions of working that used to obtain, and which are now often being misquoted and erroneously applied to modern conditions and systems. The sel-d'or toning method is a case in point; since the combined bath has been resuscitated in its present form, we have often heard its older *confrère* spoken of by tolerably old hands as the old sel-d'or bath. This is not only erroneous, as we have said before, but it is also misleading to those who have but recently entered the ranks of photography.

DEVELOPMENT OF GELATINO-CHLORIDE PRINTS.

Since the first advent of gelatino-chloride printing-out paper, the possibility of utilising the same paper for either direct printing or for development has exercised the minds of many experimentalists, but it is only comparatively recently that any really successful solution of the problem has been achieved. Proceeding on the lines of the old development methods on silvered paper, acid silver development with either pyro or gallic acid had been found superior in every way—although far from perfect in its action—to any alkaline method, until Mr. W. J. Wilson demonstrated the possibility of successful development by first converting the silver chloride in the paper into bromide. Then, at last, the difficulty of developing print-out papers disappeared.

But, in our correspondence columns last week, Mr. W. Ridler again revives the silver development method, for that is practically what the employment of tannic acid means, although he gives little information as to the details of working or the quality of the results obtained as compared with alkaline development. Such expressions as "pyro in ten per cent. solution, acidified with nitric acid," and "*about* as much tannin as would stand on a threepenny bit," are so delightfully vague that one can scarcely feel himself safe in ounding a formula upon them. However, it is clear from the perusal of Mr. Ridler's letter that acid silver development is what is meant, and it is worth while to inquire whether tannic acid offers any advantage in that connexion over gallic or pyrogallic.

At first sight the instructions given in the postscript—to immerse the paper (Solio is mentioned) in the developing solution without previous treatment—are calculated to raise a feeling of wonderment as to what will arise from the combination of the tannin with the free silver in the paper. Strange to say, on trying the experiment of dipping a strip of unexposed paper in a plain solution of tannin, no immediate discolouration ensues, probably owing to the restraining action of the small amount of acid contained in the emulsion film; but, if the strip of paper be left soaking for a few minutes, not only is the emulsion discoloured, but, what is far worse, the paper itself is at least as deeply stained; indeed, if the discoloured emulsion be removed by means of hot water and friction, and the under surface of hardened gelatine laid bare, the latter will be almost white, while the paper underneath it is deep brown, showing that the stain on the paper does not arise from any soaking of the silver contained in the emulsion.

It is pretty evident, therefore, that development with a plain solution of tannin is practically impossible. We submitted a half-printed proof to the action of a five-grain solution of tannin, with the result that in about a minute it appeared to have become stronger, or to have commenced to develop; but, on closer examination, the effect was found to be really due to incipient discolouration, and not to any real developing action, and in a few minutes more the original image was almost buried in the stain.

Turning from plain tannin, we essayed development with a solution containing five grains to the ounce, with varying proportions of citric acid, commencing with a quarter of a grain and increasing up to two grains to the ounce. The only result we could obtain by this treatment was a more or less delayed staining of the picture and paper as already described, without, as far as we could detect, any symptoms of real development.

Possibly, we argued, the function of the tannin is to act as a restrainer when pyro is used, as mentioned in our correspondent's letter, so we made a solution containing one grain of pyro, three grains of tannin, and half a grain of citric acid to each ounce, the quantity of acid used being the minimum that seemed capable of warding off the stain for a sufficient period to allow of useful development taking place. At the same time we prepared another solution of similar strength, but omitting the tannin.

The pyro-tannin solution when applied to a print that was only about half exposed certainly brought it up in strength; but, before it had reached a point at which it might be considered fit for toning, the discolouration already experienced had set in. In this respect the acid pyro alone showed a decided advantage, for, although eventually it also stained the image, yet it permitted the development to proceed further before the discolouration began. We may say, however, that in none of the experiments we made with varying proportions of the ingredients were we successful in producing a result in any way approaching that easily obtained by the alkaline method, following the treatment of the print with bromide of potassium.

Tannic acid, either alone or in conjuction with pyro, does not, therefore, appear to offer any great advantages for development purposes.

The Royal Photographic Society.—We understand that, since the Photographic Society of Great Britain became a "Royal" Society, a large number of inquiries and applications for membership have been made. It is an open secret that a scheme for the creation of two classes of members will shortly be brought before the Society. This scheme, we are assured, will be a financial advantage to the Society, and will make membership additionally advantageous to a great many. We wish the Society success in its endeavours, which are very opportunely timed. It should be worth a great deal to your professional photographer to be able to print "F.R.Phot.S." after his name on his mounts and cards. Like the Academicians, he will be able to make an extra charge for the initials

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Poisonous Nature of Pyrogallic Acid.—It may be well to remind our readers of the fact that this substance is of a powerfully toxic nature, though this is by no means commonly recognised. A recent experimenter has been testing its effect upon dogs, and found ·2 gramme (less than three grains) sufficed to kill a dog over a stone in weight.

Keeping Properties of Bichloride of Mercury Solutions.—We have on a former occasion described the results obtained by certain chemists, showing that this solution quickly decomposes; but it is pointed out by Herr E. Barcker that the addition of a small proportion of hydrochloric acid will enable it to be kept indefinitely without undergoing any but an insignificant alteration on exposure to air or even sunlight, while, if kept without such exposure, no change whatever will be found. Tartaric acid has also a similar effect.

Pure Bisulphide of Carbon.—The very admirable properties possessed by this liquid cannot be utilised in a general way on account of the extremely foul odour possessed by the bisulphide as usually sold. It can, however, be deprived of all smell, and used as freely as methylated spirit. But, unfortunately, exposure to air, light, and moisture quickly causes it to decompose, and the old odour returns. The best method of purifying it is that of Lidot, who shakes it up with mercury until all marked odour has disappeared, and then distils it slowly. It should be used after as short a lapse of time as possible.

New Mode of Slide-making without a Camera.—Messrs. A. P. Wise and G. Day have published through Messrs. Geo. Philip & Son a little *brochure* describing how this may be done. A drawing of the required illustration is first made, and then transferred by tracing upon a piece of thin tracing paper. This paper tracing is then used as a negative, and printed from in the ordinary manner. To photographers this method will seem an absurd waste of time. If hand work at all is needed, nothing is better than a drawing on finely ground glass, afterwards varnished over, or a smoked glass may be used and drawn upon, so as to give a black ground and white lines.

Photography of the Ultra-violet Spectrum.—Messrs. J. M. Eder and E. Valenta have recently been experimenting in this direction, using a Bünsen burner as the source of heat. The apparatus consists essentially of a wheel, the axle of which is inclined at an angle of forty-five degrees to the perpendicular, and which is kept in slow rotation by clockwork. At the edge of this wheel is a broad strip of very fine gauze of platinum wire, which, on one side, extends into a capsule, containing the required saline solution, and on the other side a Bünsen flame. The slow motion continually conveys fresh liquid into the flame, which is thus kept constant. Care must be taken to see that only the upper part of the Bünsen flame is placed in front of the spectroscope slit. A series of fine photographs of the spectra of various metals are appended to the memoir, some of these having received an exposure of up to thirty hours.

New Specific Gravity Bottle.—The attention recently drawn, through the discussion on the strength of ammonia, will give interest to a description recently published of a modification of the ordinary bottle used for taking specific gravities, devised by Mr. H. Louis, described in the *Journal* of the Society of Chemical Industry. The new bottle differs from the ordinary type only in that the stopper is longer than usual, and is graduated, whilst the ground-glass cap is ground to fit accurately over the neck of the bottle, and thus prevent the loss by evaporation that occurs during weighing, &c. It is filled in the usual way; the neck and stopper are then wiped dry, the cap is put on, and the body of the bottle dried. When weighing the bottle, any variation in the height of the column of liquid in the capillary tube must be read off on the graduations, which may be to any convenient scale. The author's graduations are one-twentieth of an inch apart, corresponding to one one-hundredth of a grain of water. It is an easy matter to calibrate the tube, and to make the necessary corrections. The capped bottle can be left for a long time without diminishing in weight through evaporation taking place.

Polarised Light.—In cases where it is desired to investigate a ray of light reflected perpendicularly from a surface, it is usual to employ a transparent plate of glass which transmits the incident ray before it falls upon the surface, and partially reflects it aside on its return. Such an arrangement, best known as Gauss's eyepiece, may be called a Gauss's plate. The best position of such a plate is, as pointed out by Herr B. Walter, in the current number of *Wiedemann's Annalen*, not the commonly accepted one of 45°, but another depending upon the refractive index of the material of the plate, and upon whether the light is polarised and in what manner. From theoretical considerations, he concludes that, for light polarised either in or at right angles to the plane of incidence, the greatest possible intensity of the reflected light is fifteen per cent. of the original intensity, whatever may be the refractive index. If the light is polarised in the plane of incidence, the plate must be placed at a lesser angle to the ray the smaller the index of refraction. For light polarised at right angles to this plane the reverse holds good; but, for refractive indices, about 1·4 this angle reaches the common value of 7° 46′ 16″. The best position for ordinary light may be determined by regarding it as composed of the two species of polarised light. For crown glass the inclination should be $10\frac{1}{2}$, at which position the intensity of the reflected light is 2·84 times that obtained with the usual inclination of 45°.

Solar Eclipse Photography.—Mr. Albert Taylor recently read a paper before the Royal Dublin Society on the selection of suitable instruments for photographing the solar corona during total solar eclipses. The photographs obtained by other observers and himself, during the total eclipse of April 1893, have indicated the best methods, both photographic and instrumental, to be adopted for the next observable total solar eclipse on August 8, 1896. One of the most disputed points in eclipse photography, says Mr. Taylor, refers to the proper exposure required to obtain the faint extensions of the corona without fogging the plate by the sunlight. Two opposite opinions are held as to the best method of photographing these diaphanous coronal extensions. Short exposures and slight photographic action are believed by some observers to give the best results, but others hold that long exposures and great photographic action are necessary to attain the desired end. An examination of the photographs obtained during the eclipse of April 1893 shows that the latter view must be abandoned; and that nothing is to be gained by using photographic actions exceeding fifteen or sixteen. Photographic action is determined by the formula $100\,\frac{a^2}{f^2}\,t.\,s.$, where a is the aperture of the instrument employed, f the focal length, t the time of exposure, and s the sensitiveness of the plate. For obtaining photographs showing the detailed structure of the inner and middle coronæ, short exposures and a long-focus object-glass are recommended. The opinion is expressed that, with a twelve-inch object-glass of between forty and sixty feet focus, one hundred seconds' exposure would give nearly all the corona that is within

reach of the photographic method of attack in the present state of photography. It is believed that, with an instrument having a focal length equal to ten times the aperture, all the external corona would be obtained in about fifteen or sixteen seconds.

A Home-made Chemical Balance.—It is well known that balances of extreme accuracy and not over-difficult to use may be, and have been, made out of the simplest materials by any one possessed of very little manipulative dexterity. The simplest of all these that we have seen is, however, described in a recent issue of *La Nature*. The title appeared in the "Contents" list for August 19, but, singularly enough, the article itself was not printed till the number for September 1. Briefly, the beam of the balance is made of a knitting needle, which is passed through a half bottle cork split longitudinally. Two sewing needles are pushed downwards through this cork (one on each side of the beam), and the points, brought to a level, rest on the lip of a bottle and swing from them. To keep them from slipping, a groove is filed on one side of the lip, and on the other side, just opposite, the file is used to grind a minute aperture; thus one needle rests in this hole, and the other in the groove. Then another split cork is fastened to each end of the beam and a sewing needle, eye end down, is pushed through. This forms a point of suspension for a tiny wire hook, from which are hung the pans—pieces of cardboard held by fine wire or silk thread. The balance is complete now, but not sensitive. The "gravity bob" is produced by pushing a very fine knitting needle through the central cork (which is over the bottle mouth) till it reaches half-way down the bottle. This needle projects also above the central cork, and on this portion is slipped a small cork, which, by being placed higher or lower, enables the sensitiveness of the balance to be established. The lower portion (within the bottle) forms the indicating needle, and, if too long, thin pieces of stiff paper should be glued face to face over this part of the needle before it is placed in the bottle—they will have spring enough to return to a condition of flatness when they pass the neck to the interior, and then their edge being near to the surface of the glass enables the pointer to be read easily against a paper scale pasted upon the glass. Weights are to be made of a length of thin wire cut up in a suitable manner — the longer ones coiled or bent. The standard weight is to be a twenty-franc piece, selected for its average weight out of several. For this country a new sovereign would answer, its correct weight being 123·37447 grains.

AMMONIA SOLUTION.

I WAS much pleased to see Messrs. Haddon and Grundy's paper on this subject, read before the London and Provincial Photographic Association a fortnight ago, for, though it traversed the exact ground I myself had recently been working upon, it emphasised in the strongest manner every conclusion I had arrived at; indeed, every portion of it runs parallel to my own experiments and practice. I confess to being old-fashioned enough to prefer ammonia and pyro for general work to any of the new developers or other alkaline pyro combinations, and this not from the inertness usually attributed to well-experienced workers in a particular groove, but as the result of an exceedingly large number of comparative experiments performed with all possible care to assure similar conditions—experiments, too, made not with one maker's plates, but with almost every maker's of repute. Having arrived at this conclusion, it is now my invariable practice, if I experiment with a fresh brand, to first ascertain the maximum amount of ammonia to pyro that a properly exposed plate will stand without chemical fog. I then take half or two-thirds this maximum as my usual working proportion. Having fortunately the opportunity of obtaining solution of ammonia from one or more houses of repute who deal largely in chemicals, I generally prefer to get a number of bottles, each holding one pint, in stock at once, under the expectation of having it "always good alike," an expectation usually borne out in practice; but recently, having experienced in my developing an unusual variation of results, which I was not inclined to attribute to the plates, I turned my attention to the ammonia. So far from being "alike," the contents of the bottles were conspicuously unlike, however "good" they might be. For photographic use I think the specific-gravity test is amply sufficient, and one of my assistants, thoroughly expert in chemical manipulations, was set to take the specific gravities of several of the bottles then in stock. The results so astonished me that I had the whole results checked by reweighing fresh samples, but in every case the first results were proved to be correct. These bottles consisted of portions of a new stock and one of an old supply. The stoppers fitted well, were securely and efficiently luted, and finally tied over with bladder, so that there was no chance of the gas escaping. It will be understood, too, that they were obtained not from a retail house but from wholesale dealers of high repute.

The bottles were kept always in a cool room, and the luting left as when first applied. When examining their strength, they were taken into a room at a temperature of 60°, the luting removed from one bottle at a time, the stopper withdrawn after gently shaking the bottle, and a portion at once transferred direct into a 500 grain specific gravity bottle, with thermometer stopper. The results were as follows:—

Bottle No.	1,	specific gravity	found,	·917
„	2	„	„	·917
„	3	„	„	·891

Here was a revelation.

A bottle which had been poured from on three or four separate occasions, and which I had had no reason to doubt, was next tried, and the result was excellent. Although it had been unluted for two or three weeks, and must have lost some of its gaseous contents, it yet proved to be the best of all, its specific gravity being no more than ·886, showing that at first it must really have been saturated. I need scarcely inform my readers that the specific-gravity bottle was trustworthy, the weight of its contents in distilled water, at 60°, being exactly 500 grains. Now, when we have large dealers, well known in the trade, supplying such inferior samples as these, it is little to be wondered at that the same, or worse, variations in strength of solutions of reputed specific gravity ·880, should be found in the ammonia solution supplied by the retailers.

It is not difficult to calculate what these variations really mean. We have the tables of both Carius and Messrs. Lunge and Wiernik to refer to, the former taking the specific gravity to four and the latter to three places of decimals. Carius gives us for solution of ·884, 34·1 per cent.; while the latter say 35·8 and 36·0 for ·8848 and ·8844 respectively. For ·917 we may take twenty-three per cent. as being indicated by either. Thus, taking the weakest sample of my stock it would actually need, about fifteen and a half ounces to be equal to ten ounces of the strongest ammonia made, and, indeed, more than fifteen ounces to equal ten ounces of my strongest sample!

No possible certainty in developing operations could exist while using materials of this variability of constitution. Evidently, where exactitude of conditions are sought, Messrs. Haddon and Grundy's and my own experiments show it will be absolutely necessary to test all samples of ammonia before bringing them into use.

To do this in the simplest manner possible will naturally be the aim of every one who has little spare time. The specific-gravity bulbs of Messrs. Haddon and Grundy are excellent, but it is not every one who possesses skill in glass-blowing for even so simple a purpose as this. A little piece of glass tube, sealed with shellac at each end, and adjusted, would answer; but it appears to me that a little contrivance like Hicks's patent glass-bead urinometer would be admirable for the purpose. It consists of a glass tube open at both ends, in which are placed four small specific-gravity bulbs of different colours, one above the other, and capable of freely rising and falling in the tube, which they nearly fit. The top or green bulb will float in the tube when a specific gravity of 10·15 is reached, the next or purple bulb floats at 10·20, the blue at 10·25, and the red at 10·30. The specific gravities of the bulbs are clearly marked on the back of the tube. No doubt, Mr. Hicks could make similar arrangements for any particular specific gravity. Perhaps for the purpose in view, if the bulbs were made to range from ·885 to ·895 by variations of ·0025, they would be of greatest use. I will put this suggestion before him and communicate the result to the readers of this JOURNAL. To

fully appreciate the result, it would be desirable to have a table of gravities, and I here abstract Messrs. Lunge and Wiernik's table, which is advantageous as showing the corrections to be made if the solution be not at the required temperature at the time of weighing.

DENSITY OF AQUEOUS SOLUTION OF AMMONIA AT 15°.
(LUNGE AND WIERNIK.)

Specific Gravity.	NH_3 per Cent.	1 Litre contains NH_3 g.	Correction of Sp. Gr. for ± 1°.
1·000	0·00	0·1	0·00018
0·898	0·45	4·5	0·00018
0·996	0·91	9·1	0·00019
0·994	1·37	13·6	0·00019
0·992	1·84	18·2	0·00020
0·990	2·31	22·9	0·00020
0·988	2·80	27·7	0·00021
0·986	3·30	32·5	0·00021
0·984	3·80	37·4	0·00022
0·982	4·30	42·2	0·00022
0·980	4·80	47·0	0·00023
0·978	5·30	51·8	0·00023
0·976	5·80	56·6	0·00024
0·974	6·30	61·4	0·00024
0·972	6·80	66·1	0·00025
0·970	7·31	70·9	0·00025
0·968	7·82	75·7	0·00026
0·966	8·33	80·5	0·00026
0·964	8·84	85·2	0·00027
0·962	9·35	89·9	0·00028
0·960	9·91	95·1	0·00029
0·958	10·47	100·3	0·00030
0·956	11·03	105·4	0·00031
0·954	11·60	110·7	0·00032
0·952	12·17	115·9	0·00033
0·950	12·74	121·0	0·00034
0·948	13·31	126·2	0·00035
0·946	13·18	131·3	0·00036
0·944	14·46	136·5	0·00037
0·942	15·04	141·7	0·00038
0·940	15·63	146·9	0·00039
0·938	16·22	152·1	0·00040
0·936	16·82	157·4	0·00041
0·934	17·42	162·7	0·00041
0·932	18·03	168·1	0·00042
0·930	18·64	173·4	0·00042
0·928	19·25	178·6	0·00043
0·926	19·87	184·2	0·00044
0·924	20·49	189·3	0·00045
0·922	21·12	194·7	0·00046
0·920	21·75	200·1	0·00047
0·918	22·39	205·6	0·00048
0·916	22·03	210·9	0·00049
0·914	23·68	216·3	0·00050
0·912	24·33	221·9	0·00051
0·910	24·99	227·4	0·00052
0·908	25·65	232·9	0·00053
0·906	26·31	238·3	0·00054
0·904	26·98	243·9	0·00055
0·902	27·65	249·4	0·00056
0·900	28·33	255·0	0·00057
0·898	29·01	260·5	0·00058
0·896	29·69	266·0	0·00059
0·894	30·37	271·5	0·00060
0·892	31·05	277·0	0·00060
0·890	31·75	282·6	0·00061
0·888	32·50	288·6	0·00062
0·886	33·25	294·6	0·00063
0·884	34·10	301·4	0·00064
0·882	34·95	308·3	0·00065

I will conclude my observations on this subject, of so great practical importance, by repeating the caution given about opening bottles containing ammonia. They are extremely liable to spirt when the stopper is removed, and, if a single drop were to enter the eye, the result would be acutely painful and exceedingly dangerous.

G. WATMOUGH WEBSTER, F.C.S.

CLOUDLAND.

IT may, perhaps, be owing to the unsummerlike prevalence of cloudy weather, or to the offensive baldness of many otherwise decent photographs brought under my notice, that has instigated a gossip about clouds. It is remarkable what an amount of talk, iteration, and reiteration of the most evident fact is necessary before its absorption by the photographic mind in sufficient degree to lead to much practical benefit. Any information, except the reduction in price of some popular commodity, is so slowly assimilated, that an unmerciful deal of saying it again is ever required before the seed sown will fructify as it ought.

It is curious, too, how the *traditions* of wet-plate photography cling to, and influence, the work of to-day, although, in all probability, the greater proportion of workers know little or nothing of wet-collodion manipulation. The old adage, "Expose for the shadows, and let the lights take care of themselves," is only applicable in a modified degree to modern dry-plate photography. However suitable in some cases, it is not so in others. With wet collodion it was almost always right, an excellent and safe rule to adhere to, and so it remains with all *slow* processes. With rapid ones this dictum must be taken with a certain amount of reservation, as it seems the *proportional* rapidity of exposure between a dark and a well-illuminated subject varies somewhat more than with wet collodion; and, did we attempt to carry out this rule in its integrity, our distances would often be obliterated, unless special means were adopted to meet the occasion. Primarily, exposure is the dominating factor in all photographs of any subject, whether with much or with little contrast; and, if this is insufficient, we get the more brightly lighted parts blocked up before proper printing detail is developed in the shadows. Owing to improvements in the manufacture of plates during the last few years, we get extra rapidity without any corresponding drawbacks. Still there is a vast difference in the *kind* of image produced by different brands of plates of about the same degree of sensitiveness. The gradations from clearness to opacity vary very much. Some go, so to say, by leaps and bounds from one density to another, and others more gradually, which, I need scarcely remark, are the best for subjects with great contrasts as land and sky.

Very great rapidity of exposure is not needed for clouds, a hand exposure being all that is required in the matter of time. With snap-shot exposures the clouds are frequently well rendered, and the landscape too as far as detail goes, but in almost all very quick exposures there is a lack of atmosphere in comparison with a time-exposed negative, a want of quality, so to say, that it seems nothing but sufficient exposure will produce. When clouds are taken for themselves, the exposure is of very little consequence so long as sufficiently quick to secure them sharply defined; the longer *reasonable* exposure, short of registering motion, the better quality the cloud negative will have. This, I fancy, applies to photographs of all kinds when dealing with moving objects, and using the plates and developers generally approved. Clouds, like landscapes, vary much in luminosity, and on a perfectly still day the clouds may appear stationary and highly luminous. It goes without saying that a *very* brief exposure is absolutely necessary. When possible, a minute or more might be given without showing signs of *movement*, but hopeless over-exposure would result. Again, dark, thundery clouds might require an exposure as long as possible to give them, in order to secure any gradation in the darker portions. There can, in fact, be no cut-and-dried rule for exposures on clouds any more than for other objects, but they do not require the ultra rapidity of exposure many people seem to think requisite.

The principal difficulty with clouds in landscapes has always been found to be the exposure; ninety-nine times out of a hundred the sky which seems to be coming up nicely will be hopelessly blocked before the detail of the landscape is half done, or, at best, will be so dense that clouds slightly showing on the negative will not print at all, or very little, on the positive. There is always a difficulty, more especially if isochromatic plates are used, in seeing how the development progresses by the weak red light the use of such plates render necessary. Many little dodges might be used in order to equalise the development if the operator could only see what he was doing; but practically working in the dark prevents it. On this account, better results may be ensured on plates that will bear a fair amount of light without fogging. In the first place, we are well aware that, if our landscape is properly exposed, the sky must be overdone. So, to meet the difficulty, we begin the development with a well-restrained developer, and carefully watch the process until the development of the sky is nearly complete. Now wash and change the developer for a less-restrained kind, and continue the action over the landscape part with a brush, frequently washing it off to ascertain how

matters are progressing, always keeping the sky portion uppermost, and using great care to prevent any of the more active developer running over the sky, causing streaks of unequal density. Of course, the brush work requires a little knack to do in a workmanlike fashion; but the difficulty seems greater than it really is, and very satisfactory pictures of clouds and landscape combined may be obtained by this means.

The greatest falling off in the majority of photographs that possess well-rendered clouds is absolute want of atmosphere in the landscape, the distances, instead of merging nicely into the sky, are hard and sharp cut, with no feeling of harmony about them. The lights and shadows of a distance, even on the clearest day, are always many degrees less prominent than those of the foreground, even if well defined and when rendered devoid of atmosphere, as in many—I might say most—photographs with good clouds taken on orthochromatic plates with a screen, are untrue to nature. So difficult is it to get the best effects in both cloud and landscape on one plate that printing in clouds from a separate negative is generally the best plan from both artistic or technical standpoints. In this case there is no compromise required; the clouds are taken with reference only to themselves, and the landscape also to itself; so we get the best results on each. Let alone this, it rarely happens that clouds arrange themselves in the best position for the composition of the subject; they may occasionally do so, but it is a rare occurrence. We cannot afford to neglect the value of a properly placed cloud, which will make an uninteresting subject into an interesting one and a bare strip of ground into an attractive picture.

If we carefully examine the works of many of our leading landscape painters, we shall soon see the value of artistically arranged clouds. In all probability, few of those clouds were in existence at the time and in the position represented when the landscape was painted. A dark or a light cloud may vastly enhance the value of lights and shadows on the ground by contrast or harmony, binding the subject together into a compact satisfying whole, and adding to that feeling of space and atmosphere that a blank space or unsuitable clouds never do. The study of clouds is, moreover, interesting in itself; it will soon be noticed that some special form of cloud is peculiar to certain kinds of country or locality, and absent in others. Flat, marshy districts are canopied by quite distinct shape of clouds to those of hilly, mountainous regions. Again, clouds over or near to thickly built-over districts are different to those of the more sparsely populated country. If we watch a sunset, say, from Oxford-street, London, and one from some Welsh mountains, the difference will be at once easily appreciated and understood. Smoke has a modifying influence, not only on the colour, but on the shape of the clouds, as also have wide expanses of marshy ground. The stratus cloud is a formation of vapour much more prevalent over water—as the mouths of rivers and sea—than more inland. A cloudy day in Cambridgeshire or Lincolnshire and the fen country, is rarely without this form of cloud, whilst, over the higher lands, the cumulus is more in evidence. The cirrus cloud forms at a much greater elevation, and may be noticed in any district. I do not think anything can exceed in beauty a grand display of cumulus and stratus clouds; although the cumulus cloud is of itself the most beautiful, it is not always the most suitable for addition to a landscape, nor are clouds taken with the sun behind them. They may be more effective as clouds, but less in harmony with the scene.

In an open landscape the effect of a rain cloud is often particularly telling as it approaches from one or other side of the picture, varied frequently by sloping lines of falling rain, that become dissipated before reaching the earth, adding considerable interest to the work. In a mountainous district clouds may partly obscure some of the landscapes, adding the quality of suggestiveness almost better than mists, which is an indefinite form of cloud, very useful on occasion, and one that will metamorphose the outline of the hills in the most remarkable manner. An apparently plain solid mass of mountain will, in a few minutes, be changed to a series of hills and valleys as the mist drifts across, obscuring and revealing prominences or depressions, hitherto unsuspected, in its course. It is not until clouds have been carefully watched and studied that their infinite variety is seen and appreciated. To an ordinary observer a cloud is a cloud and nothing more, unless some special brilliant display of colour attracts attention. Who but the entomologist can form any idea of the beauties of insect life, which exist in abundance all around, without attracting the least notice from the majority, and when their beauties are pointed out come as a revelation and a surprise?

The forms of cloud invariably appeal to the artist eye for beauty of design and delicacy of colouring. However, they teach us more than that. By their appearance and disposition we can form shrewd guesses as to the coming weather without consulting the barometer, which may save us some useless journey or indicate the probable termination of a successful one. Their forms are, however, the special point which concerns photographers, to whom they are undoubtedly of the greatest value. The flatter the landscape the more important bearing have the clouds on the composition. They, in many cases, make the picture. A narrow strip of uninteresting country, a bush, and a figure *with clouds* will make a picture; *without*, not be worth looking at. If the subject nearly fills the plate, a mere peep of cloud will add considerably to the interest by suggesting the idea of space that a little vacant patch of white paper would fail to do. For my own part, I never consider a landscape perfect without clouds. Such photographs always convey an idea of incompleteness, the more so as the fault is so easily remedied. Not that some particular developments of clouds are especially attractive on their own account, but that they add considerable value to the rest of the subject, increasing its boldness and solidity, and its contrast, and, as I have before said, suggesting space.

Photographers would find it much to their advantage to have negatives of clouds with various kinds of lighting always ready to hand, so that there should be no difficulty in getting a proper and artistic combination for any kind of landscape that may be printing. A little bit of unpretending pearly cloud will more often be useful than a very varied and beautiful mass to add to our landscape. Another thing in a photograph, clouds should never challenge attention before the subject to which they form an accessory. If printed very dark, and covering some of the lighter portions of the landscape, a very ugly effect is produced, both inartistic and unreal. It is always better to have them too light than too dark, for in nature the darkest cloud is comparatively light when compared with earth shadows. Even in moonlight scenes, where perhaps the darkest clouds are admissible that can be used in photography, there is considerable difference to the shadows of material things, that is, of objects having a solid opacity. We must not overlook the fact that all clouds are but masses of vapour, and penetrable, more or less, by the light, according to their density or volume, and, when they are represented with as strong contrasts as if they were solid bricks and mortar, as *they frequently are*, instead of adding a beauty to the picture, they detract from it, by producing an impossible, as well as most inartistic, effect. An airy lightness should pervade all cloudscapes, whether in combination with landscapes or by themselves, Whenever this intangibility is overlooked, and we treat clouds as solid matter, we make a mistake and ruin our work. Refinement, delicacy, and good judgment are qualities absolutely necessary to successfully deal with clouds, and the same qualities must show themselves in our pictures.

EDWARD DUNMORE.

ON THE DEVELOPMENT OF UNKNOWN EXPOSURES.

II.

In a previous article I referred to the disadvantages of operating in a small developing closet when large batches of plates had to be dealt with. Plenty of room is the first necessity, and not only should the air space and ventilation be of the very best, but there ought in all cases to be an abundance of bench accommodation running for at least the entire length of the room, for the number of dishes required in work of this description is much greater than would be deemed necessary with plates of known exposure. A bench of twelve feet in length by four feet broad will be none too large, and such should be well lighted at convenient distances apart by at least three large safe lights, and the height from the floor is another matter that should be considered if the utmost degree of comfort is to be experienced. Some operators prefer to sit during development, but, where there are a number of baths and dishes to work with, it will be found more suitable to employ a standing posture, and therefore the bench should not be too low. Breast high is a very comfortable height, and will go far to save many a back ache during the miserable hours an operator has frequently to spend shut up in a dark room.

The next important consideration is the class of dishes to employ. I have no hesitation in saying that, white porcelain dishes are far and away the best for all photographic purposes, those miserable shallow apologies of the vulcanite pattern with sloping sides should never be found in a well-appointed dark room. Let good deep porcelain dishes be employed. When I say deep, I mean that no dish ought to be shallower than two and a half inches, and a depth of more than this is desirable in very large sizes.

A very convenient size to employ, when plates of, say, half-plate

dimensions or under are being dealt with, will be a number of such of fourteen inches by twelve by two and a half inches deep. This size will permit of three half-plates being dealt with at one time in the developing solution, and this number is quite large enough to have to deal with at once when all conditions are unknown to the operator. It is, I know, quite a common practice for professionals to develop as many as from six to twelve at one time, but then in their case the exposures are well known to be about right, and they will generally be found to come along in beautiful regularity, and require but little, if any, special treatment during the operation. But in all cases where unknown exposures have to be dealt with three plates at a time will be found just about as much as any one can tackle, having in view the necessity of affording some particular treatment to the ever-varying cases that are sure to crop up.

With dishes of 14 × 12 a large amount of work can be got through in an hour's duration even when three at a time are being dealt with. Three, at least, of these dishes will be required for developing purposes, whilst, for fixing, nothing is better than a large corrugated porcelain trough, sufficiently full of hypo to entirely cover the size of plates being developed. In addition to the three developing dishes, two smaller-sized flat dishes ought to be at hand, charged one with plain cold water and the other with a weak solution of alum, the use of which I shall refer to later on.

Everything should be carefully prepared before any commencement is attempted.

The plates to be developed should be taken out of the boxes or packages in which they are contained, and all placed one way in a convenient box, with light-tight lid, without grooves. This will enable the operator to get possession of his plates without any delay or trouble, for nothing is more slovenly than to see a worker groping in the dark room for, say, a brown-paper package, and opening it with the view of taking out one plate now and then during the operations of development with fingers all smeared with hypo, or some of the other baths he has been using. This method of working is sure to cause its own particular kind of failure in the shape of thumb-markings and other often unaccountable spots on the negatives, and which are frequently blamed to the plate-maker. When the plates are all unpacked beforehand, and easily got at, at least one very common cause of failure will have been overcome.

In all cases where a large number of plates have to be dealt with, it is most desirable that an operator should have the help of at least one intelligent assistant, for the necessity of the utmost promptness in the removal of a plate from one particular solution into another will frequently occur, the failure to do which often mars a good picture. And what can one pair of hands accomplish alone? There certainly is a limit to one operator's capabilities; besides, it is much more cheery too see one's work going satisfactorily along, and knowing that you are prepared to deal with anything that may require prompt action.

Everything being in readiness, let three separate developing solutions or baths be prepared, and in doing this an operator had better confine himself to the particular kind of developer he is accustomed with. Into the centre dish place the normal developer generally used for known exposures; into the dish on the right place a developing solution prepared more especially to meet the case of over-exposure; and on the left hand of the centre dish have one made up to meet cases of under-exposure. The right and left-hand baths should be of much larger quantities than the centre, or normal one. Sufficient bath ought to be prepared to entirely cover the cases of over and under-exposure, so that the plates can lie submerged in the solutions, for it will frequently happen that such plates require to be very rapidly plunged from one solution into another, and if an insufficient quantity of bath has been prepared. there is almost certain to follow traces of unequal development; hence the need of a large supply of solution in both the accelerating and retarding baths.

I have said that an operator will be wise to follow the formulæ for development which he is best accustomed with the working of, so refrain from offering any opinion as to what I consider the best formulæ to use. I may say, however, in practice, I have never seen any reason to depart from our good old friend pyro, either when used in conjuncton with soda and potash, or ammonia.

Having carefully prepared all the necessary solutions, let a sufficiency of developer be placed in each of the three developing dishes. In the centre dish place at least from eight to ten ounces. This quantity, when using dishes of the dimensions stated, viz., fourteen by twelve inches, will be sufficient to flow evenly over the faces of the three half plates when all are in together, and the dish is kept gently rocking. Taking the first plate in the right hand, with the left tilt up the dish until the solution forms a pool next the operator. Place the plate in as near as possible the centre of the dish, and then, by gently tilting the dish up, the whole of the solution will be found to pass over in one wave without breaking. Continue with one plate for a few seconds. Any cases of over-exposure will soon be apparent. Should such not appear after a short time, it may be safely conjectured, provided all care has been exercised in the preparation of the developer, that such is not present, when another plate may be placed in the dish, the first one having been gently pushed to one end. By this time the first ought to be showing some decided symptoms of developing, and the utmost attention should then be given to form some sort of judgment as to the class of subject it contains. Should the high lights be followed in nice order by middle tints, and these again build nicely up before the shadows begin to veil over, an operator feels very happy, and will very likely imagine he has got hold of an easy lot to deal with; but at no time should it be taken for granted that all plates will behave similarly. Should the second plate behave in a like manner, the third plate should follow in the developer, and about the time the image on the third makes its appearance the first should have commenced to veil over and finish off. It will, after completion of the first three, be a wise proceeding to have a daylight examination for the purpose of judging exactly of the density, although a practised operator can pretty well form an opinion by examining against the red light. There is, however, nowadays, such a wide difference in the density-giving qualities of the various brands of plates on the market, that it may be found necessary to either increase or reduce the strength of the pyro in the normal bath. It should always be borne in mind, however, it will develop the first few plates with greater energy, and yield a somewhat thinner image, than the plates that follow after, when, after a while, it will be necessary to strengthen the normal bath, or to make up a new one.

Unfortunately, however, such good luck as I have described above but seldom occurs, and, instead of the image coming along in beautiful gradation of high lights, middle tints, and veiling shadows, the plates will be found to either stubbornly refuse to develop anything but high lights, or else, on the other hand, rush up all over at once, without either density or detail.

T. N. Armstrong.

PROFESSIONAL PHOTOGRAPHERS AND DEPRESSION OF BUSINESS.

I have recently ventured to write for the Journal articles on one or two subjects in which I was feeling a personal interest. At the present moment, having a little time at my disposal, I am led to write down some reflections arising out of articles, or correspondence, which I have recently read in the Journal on subjects in which, I think, I feel no *personal* interest, being completely an outsider. My being an outsider leads me, perhaps, to give more consideration to certain phases of the question which are probably less prominent in the minds of many of those more personally interested. In the question as between amateurs and professionals I do not feel any interest, nor do I see how, in a free country like England, it would be possible to place any restrictions on the one or the other, even if it were desirable. It seems to me rather that each must be allowed and encouraged in a free course without any restrictions, except such as affect both alike, according to the very spirit of the Journal for which I am writing; to resort to any of those smaller methods would only increase the bitterness without producing any amelioration. I would rather myself, as an outsider, put forward such of those more general considerations as might tend to allay the bitterness that appears to be felt in some quarters, for it must be in this matter as it is in political matters, where, in entering by the controversial door, one so often loses sight of what may be largely the true causes and the true remedies.

If I had the pleasure and advantage of more intercourse with photographers, I might, no doubt, be enlightened on many points. As a complete outsider, I notice, too, facts of a general nature which, I conclude by inference, must act very largely as cause of the general depression of which many photographers complain. Unfortunately the photographic business is not the only one which suffers depression from such causes, and still more unfortunately, I think, the depression is not likely to be so transitory as many people, arguing from a too superficial examination of the past, would have us believe. Twenty years and more ago, when residing in Germany, I sometimes could not wait till I came to England to have new clothes made, I was very careful to choose there for them English cloth. I knew that the German, although cheaper, might not last half so long.

When Prince Bismarck had so far accomplished politically the

task which he had set himself as to be able to turn his attention to other means of adding to the prosperity of his country, he began to arrange a system of higher import duties. I read, with no little interest and desire to learn, the lectures that were so amiably given to him on this question, as had been done on other previous questions, by English papers in order to save him from his folly. The reflection occurred to me that, although the great German statesman might possibly not understand what legislation might most tend to promote the prosperity of England, he might possess a clear judgment, on this point at least, in regard to his own country, and I have since been on the watch for facts which might verify the one opinion or the other, doubting little, however, in my own mind, in which direction it would be.

On the two occasions during the last seven or eight years on which I have found it necessary to have clothes made in Germany, apart from certain specialities only made in Great Britain, I found plenty of nice cloth, both German and English, and when I found the German cloth that pleased me at least equal in quality to the English, and necessarily at a considerably lower price, I naturally did not hesitate to choose the German, and I have since found the wear of these clothes all that I could desire. Of course, I could not help reflecting also how completely Prince Bismarck has been attaining his object. It is easy to realise how very largely *in the German market*, where for best clothes English manufactured good were almost a necessity, these must now be superseded by German.

To what extent the German manufacturers are placed by different circumstances in a position to outsell the English in the markets of Great Britain, in the British colonies, and in other parts of the world, there must be many able to say much more exactly than I can even guess. I have spoken only of Germany, where I have had more opportunity of observing, and of one department only; but, where I have met Germans in other departments, I have not failed to notice the buoyant feeling with which they contemplate the continual extension in the business they are able to do, and when I talk to them, as I am in the habit of doing, for I like to get at the true causes of things, I find the conviction that, in certain departments at least, and these very important ones, this increase is chiefly at the expense of England. If this is taking place in the manufacturing world, it is a question whether something similar is not taking place in the commercial world, and, if it is taking place in regard to one of the great rivals of England, whether it is not taking place more or less with regard to others also.

Now, let us consider what is likely to be the effect of all this on England. Here, again, I speak chiefly as an outsider; but there are many little signs from which I have drawn conclusions, and, whenever I have been able freely to converse with any one in England moving in such a position as to know what is actually going on, I have found my conclusions endorsed. There are many very important questions arising out of this state of things which would take us far beyond the object contemplated by the JOURNAL; but this much, I think, we may gather for our present purpose.

During some twenty years a change has been going forward in England on rather a vast scale; silently indeed, for those most nearly concerned do not proclaim such things from the housetops, but not less surely, by which, nevertheless, firms have been brought to the state that they no longer exist. From numberless others, those who had conducted them prosperously, seeing how things were working, must have lived under such conditions as to save for themselves, as far as possible, some portion of what they had previously been able to lay by. Of the more fortunate ones that have survived, apparently unimpaired, it is evident that, what with the higher wages they have been compelled to pay, and the lower prices they have been forced to demand in order to meet the foreign competition, the incomes derived by those concerned must, in many cases, be on a very different scale to what they previously had been. I think this must be the case very largely in the commercial, as well as in the manufacturing world. If we regard the agricultural interests, I think we shall find, from whatever causes, a state of things not much more satisfatory. I knew that a great change had been going on, and still was surprised when, not long ago, I learned from some authentic statistics the real extent to which incomes had been diminished from this cause. But how does all this bear more especially on photography? For a considerable number of years incomes had been continually on the increase. There were large numbers who, after they had provided all things necessary for the social position which they thought it right to occupy, found each year a still increasing surplus, which they found it necessary to dispose of. No doubt much of this was invested in order to produce a still larger surplus, or to provide for the time when surpluses might vanish. But, no doubt, also many felt it quite lawful to invest considerable sums in objects of luxury or of taste, either to satisfy their own innate admiration for such things, or to provide for the admiration of others, and thus become persons of greater consideration themselves. In this way they would become patrons of the Fine Arts, including so much of photography as can be brought under that category. But this latter, more especially in a form comparatively inexpensive, has the advantage of entwining round it so much of the family and social interest and affections as would lead to a much wider and more continuous patronage in proportion to the means of extending it. How many persons during all this time had been living in other respects more and more "up to their means," and thus forming a larger and larger estimate of what are considered the necessities of life. What wonder, then, when the turn in the tide came, with surpluses vanishing and incomes to meet even what had grown to be necessities diminishing, a large part of what lay beyond these necessities should be dispensed with. How much have painters suffered from this cause? It is not the competition of photography alone, or perhaps even chiefly, that has injured them. I admire myself greatly a beautiful photograph, but I think any person who had the money to spare would not hesitate long between a beautiful photograph and a beautiful painting. Let us ask any charitable institution, the hospitals for instance, which were, by comparison, so well supported during the previous period, what is the cause of the enormous falling off in their incomes during recent years.

Here, then, is a widespread condition of things, arising from causes quite outside the photographic community, tending to that depression of which many photographers complain. I fear I have made this explanation too long, longer certainly than I wish, so I will not write further now; but will endeavour in a succeeding paper to point out more briefly what appears to me to be a concomitant cause, making one or two suggestions as to the only remedy I can at present see in regard to this latter. W. WASHAM.

A LETTER FROM A YOUNG PHOTOGRAPHER TO "JUNIUS JUNIOR."

JUNIUS JUNIOR, ESQ.,

RESPECTED SIR,—Under your very kind and able tuition I am making rapid strides in the photographic art. The pictures I have hitherto been able to lay before you are, I hasten to assure you, entirely my own work, including the retouching; and they are, in a great measure, due to my putting into practice, aided by my books, the principles you have from time to time so fully laid down. My dear mother, who respects you highly, and Aunt Maria are charmed with my work, though I, looking on it with an experienced eye, can see faults which they cannot, and which appear to have escaped your notice. Not that I agree with all you say. You misunderstand sometimes what I send you. In the negative of a "brick wall and rabbit hutch"—you see, I do not take offence—it is papa's pulpit that you call a rabbit hutch, and Aunt Maria is much shocked. She says you are profane, and is sending you a tract she once wrote and had printed about the scarlet woman. The "brick wall" is our curate. Unfortunately, it hardly does him justice. Aunt Maria says he is much better-looking, and she thinks with you that it might be more like him, but that you always exaggerate so, and that there is no difference between exaggeration and untruth. She thinks of asking James—that's our curate—to call on you and have some serious conversation, not, she says, that you really mean any harm, but it is a bad habit to fall into, and leads to worse things.

As you know, I have done other portraits besides this. The one I sent you last week of my dear Mary Jane is really good, and I am going to enlarge it for framing in a camera I have bought on purpose as soon as I have reduced it a little in the nitric acid bath you recommend.

Of course, Mary Jane's portrait is exceptional. I intend to do this entirely myself; but, as regards the public generally, I wish it to be understood, and I should like you to make it known as widely as you can, that I do not intend to interfere with the professional photographer. I am, and will continue to be, a real amateur. I will not be a party to taking the bread out of the professional's mouth. Many of my portraits have been much admired, and, when the sitters ask for copies, I shall send the negatives to the trade to print.

You will be glad to hear that I am much better since I drank the cyanide of potassium in mistake for the whisky. Whisky never did suit me. I mean I am better now than I was when I took it. But I was very ill at the time. I will also take your advice, and have the antidotes ready in case anything should happen in the future.

It seems to me that the manufacturers have yet a great deal to learn in the sensitising of plates. They, I mean the plates, don't act as my instruction books say they will. For instance, I have been taking some views of mountain scenery. The mountains were a long way off. I estimated them to be nineteen and a half miles. Now, I know that light takes time to travel (papa would insist on my going to the evening continuation school as an example to the young men of the village, and I learnt many things there), and distant objects must necessarily have a

longer exposure than near ones on that account. Portraits I always take with *f*-32 to get them sharp, and I give an instantaneous exposure. Then the sitter has not time to move. To get the fashionable cabinet-size head, I find there is generally about four feet between the object and the lens; so, if four feet is instantaneous, what is nineteen and a half miles? I found it difficult to work this out; but, knowing the difference was enormous, I gave a tentative exposure of twelve seconds, and, as the mountains were very faint owing to haze, I used *f*-8. I give tentative exposures when I can, as I find so much is to be learnt that way. The experience obtained is so solid and so helpful, as I have no doubt you have found out. When I came to develop them, the first plate went black at once; the second the same; I thought the matter over. I always reason these things out, and mix my developer with "brains," as the proverb has it. "Ammonia is an accelerator;" this I know; that is, to put it in plain English, it accelerates the image. So, I doubled the ammonia, to get out the image before the plate had time to go black. Then I trebled it, but still there was not enough to get the image out in time. I have saved the last plate to ask you whether I should try it with ammonia alone, or whether there is anything that will strengthen the ammonia, and so accelerate the image and get it out in time, and thus produce a perfect negative. Or, is it, as I strongly suspect, that the manufacturers are to blame?

Since writing the above I have reduced Mary Jane's portrait as you suggested. I prepared the bath very carefully (nitric acid, nine ounces; water, one ounce); but I think you must have omitted something. I always use many chemicals myself. I did it in my dark room, to prevent fog, although you forgot to point this out. There was soon a strong smell, and I could hardly breathe, and mamma wanted to know what all that smoke was. I shouted back through the keyhole that I was reducing Mary Jane. I gave it an hour, and then placed it in the hypo bath, which you had omitted to mention. When fixed, I will let you know the result.—Yours, with many thanks, RICHARD.

P.S.—I have just taken the negative out, and find there is nothing on it. I am sure I prepared the bath correctly, and that you must have made a mistake somewhere. It is a *serious loss* to me, and will be a great disappointment to Mary. I don't know what I shall say to her. Have I reduced it too much? In future I shall not reduce my negatives at all. My clothes are all over red spots, and my trousers are quite spoilt. My throat, too, is very sore.

PP.S.—Aunt Maria has just told me that James will call on you to-morrow after morning service. R.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

(*From our own Correspondent.*)

SPECIAL EXHIBITS.

IT is usual to take every year some special subject and make a special feature of that subject. In the early part of the year Mr. W. Brooks (of Reigate), member of Committee, proposed "Photography in the Printing Press," which was agreed to. Mr. Snowden Ward took up the subject in connexion with Mr. C. W. Gamble, and the result is they have brought together a most complete exhibition of photo-process work up to date, and it reflects great credit upon both those gentlemen.

The section occupies the whole centre of the great hall, arranged in cases and screens. Owing to the fact that this being the first Exhibition of its kind in the kingdom, makes it more interesting. Colour is the first thing that catches the eye; there are some very fine reproductions by the Photo-chromatic Printing Company, of Belfast; two of their specimens are very fine, produced from three-colour blocks only, and, on looking at the result, one can scarcely credit that only three colours had been used, so perfect is the result. To this firm a first silver medal has been awarded.

The Zurich Company, 61–3, Ludgate-hill, has an effective exhibit; also receive first silver medal.

Messrs. Bohrer, Görter, & Co., of Munich, are represented by fourteen large frames, including specimens of colour work, which are excellent. First bronze medal awarded.

Messrs. Husnik & Hausler, of Prague, receives a first bronze medal for their work in photo-chromo colour blocks in three printings, and the results by this firm are very fine.

Henry Calmels, 17, Furnival-street, Holborn, E.C., represents C. Gillot, 79, Rue Madame, Paris. First silver medal. Their exhibit is very varied; the reproduction of fabrics is most wonderful; one can scarcely believe they are looking at a print and not at the actual fabric itself.

The Swan Electric Engraving Company, of London, are well to the front in their special line, which may be said to be perfect. First silver medal has been awarded them.

Messrs. Raithby, Lawrence, & Co., De Montfort Press, Leicester, receive certificate of merit for photo-chromatic printing.

Messrs. Hare & Co., Limited, Essex-street, Strand, London, E.C., have been awarded first bronze medal for their process block of chalk work, which is very fine.

Messrs. Sprague & Co., 4 and 5, East Harding-street, Fetter-lane, London, E.C., take first bronze medal for their reproductions of various originals by photographic ink process.

Photogravure is well represented. There are three prints by Fox Talbot, date 1866, which have been kindly presented to the Society by Mr. C. H. Talbot. These are in the Educational Section. Well to the front in this branch is the beautiful work of H. Wilmer Eyre. It is shown in various stages, from the burnished copper plate to the finished proof. One plate is steel-faced. This is included in the educational exhibits. Mr. Herbert Denison exhibits some very charming specimens, and well merits the award bestowed, viz., a first bronze medal.

Messrs. Carl Hentschel & Co., of Fleet-street, London, show specimens of their work, and have been awarded a certificate of merit.

Messrs. Leslie E. Clift & Co., 1, Holborn-place, London, E.C., first bronze medal. They exhibit original wash drawing and reproduction by fish-glue process. They show silver prints and half-tone blocks, which leave nothing to be desired.

Messrs. Reeves & Sons, Limited, Cheapside, London, certificate of merit, show instruments and materials for black and white.

Messrs. Richards, Ward, & Co., Limited, 46, Holborn-viaduct, London, E.C., show samples of their fish glue, specially clarified for process work. Samples of the glue will be sent free to any process worker on application to the firm.

The Art Reproduction Company, 12 and 14, Clareville-grove, South Kensington, London, S.W., first bronze medal for their exhibit for half-tone blocks and photogravures.

The Acme Tone Engraving Company, Bushey, Herts, show one frame of half-tone work.

Mr. F. Downer, Watford, Herts, shows some photo-mechanical prints.

Messrs. Dawbarn & Ward, Ltd., publishers and book agents, have a display of books on all processes connected with photography and process work.

Boot, Son, and Carpenter, Old Bailey, London, E.C., send collection of prints from various classes of photo-mechanical printing blocks, &c.

The E.R.A. Photographic Block Company, 4 and 5, East Harding-street, Fetter-lane, London, E.C., send specimens of reproductions of various subjects.

Lefranc et Cie, Paris, represented by W. C. Horne, 2, White Horse-alley, Cow Cross-street, London, E.C., exhibit collotype inks in various colours. There are several specimens of Woodburytype printing well up to the standard.

The Autotype Company, 74, New Oxford-street, London, W.C., are well represented by their well-known work in their several departments collotype autogravure being the most perfect of their kind. They have been awarded a first silver medal.

Mr. J. R. Gotz, 150, Shaftesbury-avenue, London, W.C., send some very fine examples of collotype printing.

Robert Gardner & Co., 136-8, George-street, Glasgow, are represented by specimens of collotype and other processes; excellent in quality.

Mr. F. Jenkins, 46, Farringdon-street, London, E.C., examples of heliogravure, typogravure, &c., which are good illustrations of the processes.

Mr. E. J. Wall lends some early specimens of chromo-collotypes, and one can at once see the advances that have been made in this direction.

Chas. H. Fisher, head of the block printing department of the Swan Engraving Company, and W. F. Fisher, machineman of the same Company, have been awarded certificates of merit for a large collection of specimens of half-tone block printing from Swantype blocks.

The Farringdon Photogravure Company, 35, Shoe-lane, London, E.C., sends one frame of copper plates for photogravure in all stages, to finished prints, Certificate of merit awarded.

A first silver medal goes to Max Levy, Philadelphia, for ruled half-tone screens.

Photo-Autocopyist Company, London Wall, E.C., have been awarded first bronze medal for their system, which has been demonstrated daily to the delight of the public, and specimens given away which were produced on their simple apparatus. Although simple and very expeditious, first-class collotype work is produced, and it seems probable that a great future is before it if properly handled. The demonstrations were given by Mr. Taylor and Mr. Fordham. Many of the specimens were reproduced from negatives produced by local people, and the whole system was carried on in view of the public. In another part of the hall was a machine producing prints from process block for distribution, which was also an attraction.

The educational department to the various processes was most efficiently carried out in a way seldom seen for completeness, by Messrs. H. Snowden Ward and C. W. Gamble, from the crude plates to finished proofs, and also in the colour block printing departments, that nothing was wanting, and great credit was due to those gentlemen.

On Wednesday evening Mr. E. J. Wall gave a lecture on colour photography to a large audience. On Friday evening Mr. C. W. Gamble gave a lecture, *Lantern Slides and their Production*, illustrated by lantern pictures from the hand-drawn and printed slides to photo-coloured slides, and to the pure photo slides of the present day. The lantern was in the hands of Mr. W. Brooks, who showed some of his well-known collodio-bromide slides. Mr. E. J. Wall exhibited many very interesting slides, flying shots, hands and faces of criminals, and the evening wound

up by an exhibition of the oxyhydrogen microscope by Mr. Mason, of Clapham Park-road, London; the subjects were microscopic slides and pond life. The latter very much amused the audience. The performance of the microscope was perfect, and highly creditable to the maker.

Report of the Judges.—Photographic Section.

The Judges have great pleasure in again congratulating the Society upon the success of the Photographic Department, the exhibits being of a very high order and well up to date; the numbers exceed previous years, and all classes are well represented, and about three-fourths of the exhibitors are new. The Judges regret that they have not more space at their disposal.

Professional Section.

In Landscape, Mr. W. Scorer has been awarded first silver medal for his charming picture, *Ravine near Ivybridge*, taken direct on a plate 30 × 24 inches, being the largest that has ever been exhibited at this Exhibition.

Mr. W. J. Byrne, of Richmond, Surrey, has also been awarded first silver medal for the best portrait in the exhibition, *Miss Beadon*. The same artist has also several other works on exhibition of a very high order.

Mr. J. C. Burrows, of Camborne, well merits his award, viz., first silver medal for his photographs of mines, which may be said to be perfect; the difficulties must have been very great.

Mr. R. H. Yeo, of Plymouth, shows many specimens of his work, which is well known in the West. Second silver medal has been awarded him for a series of pictures of children, which are perfect.

Mr. P. T. Lancaster, of Tunbridge Wells, receives second silver medal for portrait, *A Brown Study*, which is very pleasing. There are several other productions by the same gentleman well worthy of attention.

Mr. R. Frost secures a first bronze medal for his study, *Roses*, which is very effective.

Mr. J. H. Coath, of Liskeard, also takes a first bronze medal for '*Where are you going to, my pretty maid?*' and the Judges note a marked improvement in his work.

Mr. W. J. Anckorn contributes several works to *Music hath Charms;* has been awarded first bronze medal.

Mr. J. E. Gould sends a number of pictures, landscape and marine. One subject is remarkable, a torpedo in flight from the vessel said to be travelling at sixty feet per second, which illustrates the practical utility of photography. A first bronze medal has been awarded.

Mr. G. A. Brightman has been awarded first bronze medal for his interior pictures of St. Mary's, Redcliffe, Bristol.

Mr. F. Bromhead sends one frame of pictures taken by flashlight of play scenes on the stage, which are admirably rendered. Award, first bronze medal.

Mr. J. W. Bennetto exhibits several pictures. A second bronze medal goes to his picture, *The Wave*.

Besides those who have been awarded medals are Messrs. J. Milman Brown, Milman H. Brown, J. B. Scott, W. H. Lewis, L. Beard, T. Douglas, J. H. Gear, C. Oatey, A. J. Taylor, H. E. Brightman, L. Berry, W. Warneuke, C. H. Hewitt, T. R. Brown, and W. M. Harrison, who all send some capital work.

Amateur Section.

H. Tonkin has been awarded first bronze medal for his enlargement, *Forty Winks*.

Dudley James Ford, bronze medal for a nice series of hand-camera pictures, which are very pleasing and effective.

Mr. T. Browne, jun., sends a frame of instantaneous subjects in and about Plymouth, which are very good. First bronze also awarded.

Mr. E. Brightman contributee some exquisite examples of his work. *The Village Smithy* takes first bronze medal.

Second bronze medal goes to A. Jane for study of *Chrysanthemums*, which are well rendered.

Mr. A. W. Westrop sends for exhibition some very good examples of stereoscopic transparency slides, which receive honourable mention. He also sends a Daguerreotype stereo slide of the opening of the 1851 Exhibition by Her Majesty.

Mr. S. P. Jackson, R.W.S., sends two frames of hand-camera snap shots, which are most charming. Each one is a perfect gem. To himself as an artist they must be extremely valuable. They are labelled, "*Not for competition.*"

The exhibitors who have not received awards are Messrs. C. P. Taunton, C. V. P. Keene, E. Hurrey, W. Gottlieb, E. Griffiths, A Blamey, T. Macdonald, H. Hollamby, F. P. Perkins, J. G. Livesay, and W. B. Post.

Photographic Appliances.

Mr. G. Hare, of London, has been awarded second silver medal for a hand camera, with his name to it—one of the best recommendations it could have.

A Society for Falmouth.—On Monday evening, the 3rd inst., a meeting was held in the Polytechnic Hall, Falmouth, to consider the desirability of forming a Photographic Society, which was attended by about eighteen gentlemen, including Mr. Brooks (Reigate), Mr. Snowden Ward (London), and Mr. Gamble (London), and a Provincial Committee was appointed to undertake the formation of the Society.

REPORT ON THE FIXING AND WASHING OF ILFORD PRINTING-OUT PAPER.

[Photographic Scraps.]

In accordance with your request that we should inquire into the fixing and washing of your printing-out paper on the lines of our previous work on albumen paper, we now beg to submit the results of our investigations.

The paper used was as fresh as possible, so as to avoid any complications due to the formation of sulphide of silver, which is always produced on all kinds of paper containing silver salts, especially when exposed to impure air.

Three tubes of P.O.P. were taken, and each sheet subdivided into eight parts. So as to recognise the pieces from the same tube, the backs were marked with letters A B C. In each determination, two pieces were employed from different sheets recognised by the letters.

Sufficient of the paper was washed in running water for fifteen minutes; at the expiration of that time was transferred to a fifteen per cent. solution of hypo, and the pieces of paper constantly turned over in order to allow free access of the solution to the whole of the paper to be fixed. The time of fixation was fifteen minutes. At the end of that time two pieces were thoroughly drained and set aside, the other pieces were then transferred to a large ebonite dish, into which water was constantly running. After the water had been allowed to act for two minutes, two pieces were taken out, and two again at the expiration of 5, 10, 30, 120 minutes, and 22½ hours.

Each pair of sheets was placed in a beaker and treated with mixed acids, and then taken down to dryness, and the amount of sulphur present estimated as barium sulphate.

As it would be difficult to estimate the sulphates and thiosulphates in the paper, at any stage of washing separately, we have thought it best to calculate our results to sulphur, irrespective of the manner in which it is combined, so that the sulphates of the hardening alum are called sulphur. Such sulphur is differently combined to what it is in the case of albumen *where it is a constituent of that body.*

Since the dimensions of a whole sheet of P.O.P. are not the same as those of albumen paper, the numbers corresponding to the latter, as given in our previous paper, have been raised in the proportion of 1·11 to 1, so that all figures are based on equal areas of paper.

It will, we think, be instructive to give, side by side, the sulphur found in P.O.P. and albumenised paper, where the treatment has been the same.

The figures in the table below give the amounts of sulphur, in grains, contained in a quarter-sheet of paper:—

	P.O.P.	Albumen.
Original paper unwashed	·226	·088
Washed for 15 m.	·100	—
Fixed, not washed	5·621	3·834
After 2 m. washing	·237	—
,, 5 m. ,,	·131	·107
,, 10 m. ,,	·079	·076
,, 30 m. ,,	·071	·076
,, 120 m. ,,	·065	·076
,, 22½ h. ,,	·065	·076

From a study of these figures we notice that about fifty-six per cent. of the sulphur is removed after washing the paper for fifteen minutes. This is undoubtedly due to the removal of a portion of the alum used in order to harden the gelatine, and so facilitate manipulation without risk of damage to the surface.

After the paper has been fixed and then washed for ten minutes, the amount of sulphur sinks below that found for fifteen minutes' washing previous to fixation, thus showing that not only has the hypo been eliminated, but that still more of the hardening alum has been dissolved out, and this removal of alum goes on for two hours, after which the amount of sulphur becomes constant.

These results point to the advantage of a short immersion in water, but with constant renewal of the same, so as to remove the hypo, and at the same time to dissolve out the minimum of alum.

The alum seems to be held in some sort of loose combination with the gelatine, and works out but slowly, whilst the hypo, being only held mechanically in the pores of the gelatine, is rapidly removed. Rapid washing would appear to be specially necessary when the prints are to be squeegeed on glass or other material in order to obtain a glazed surface, and the removal of the alum by long washing, no doubt, accounts for failure of the prints to detach themselves from the support when the paper is dry.

We intended originally to estimate the silver by dissolving out the silver chloride from the washed precipitate on the filter with ammonia. This, however, we found impossible, as the backing material held in suspension in the alkaline liquid rendered filtration so slow that most of the ammonia had volatilised before filtration was complete, and what did pass through the filter was so turbid, from the finely divided barium sulphate, that it was useless.

After several experiments we adopted the following method. More paper was marked, washed, fixed, and washed for the times already given and then dried. Each pair of one-eighth sheets of paper which had been

similarly treated was burnt, and, in order to remove the last traces of carbon, kept at a red heat in a porcelain crucible till the contents were free from black specks. The residue, when cold, was exhausted several times with boiling distilled water in order to remove all soluble salts. It was then boiled with dilute nitric acid to dissolve the metallic silver, and filtered; the filtrate was concentrated to a few c.c. placed in a test tube, and dilute hydrochloric acid added. Silver chloride was separated by filtration, and weighed as usual. The opalescence produced by the smaller amounts of silver was imitated in similar test tubes, with the same bulk of liquid, by means of a standard solution of nitrate of silver, and by this means the amount estimated. By preliminary experiments we found that $\frac{1}{5000}$ of a grain of silver could be detected with ease.

The weights of silver obtained we have again set side by side with those found under similar circumstances in albumen paper. The weights are grains per quarter sheet of paper.

	P.O.P.	Albumen.
Fixed, not washed	·046	·137
After 2 m. washing	·005	—
,, 5 m. ,,	·002	·087
,, 10 m. ,,	nil	·069
,, 30 m. ,,	nil	·062
,, 120 m. ,,	nil	·068
,, 22½ h. ,,	nil	·067

It will be seen from the above figures that everything that is removable, both in the case of P.O.P. and albumenised paper, has been washed out at the end of ten minutes, but, whilst in the case of albumenised paper it is impossible to remove more than ninety-five per cent. of the silver present after simple washing, the whole of the silver is removed in the case of P.O.P., and thus one of the principal causes of the discolouration of prints is got rid of. We strongly recommend, therefore, that the washing of gelatine prints should be short and in rapidly changing water to make it thorough; by these means not only is time saved, but it is also conducive to the preservation of pure high lights, and removes any chance of the deterioration of the gelatine itself due to the hardening material being removed.

In conclusion, we would recommend you to advise all the users of P.O.P. to fix for fifteen minutes in a fifteen per cent. solution of hypo, and to wash for twenty minutes in rapidly changing water, in order to remove all soluble salts from their prints, and in this way there is not the least doubt in our minds that yellowing of high lights due to the formation of silver sulphide will be a thing of the past.

F. B. Grundy.
A. Haddon.

CITY AND GUILDS TECHNOLOGICAL EXAMINATION IN PHOTOGRAPHY.

The Syllabus.

The following is the syllabus of the Examination in Photography to be held next May under the auspices of the City and Guilds of London Institute for the Advancement of Technical Education, at South Kensington. The Examiners are Messrs. Lyonel Clarke and J. D. Geddes.

Ordinary Grade.

The Examination in the Ordinary Grade will consist of a paper of questions only.

I. *Syllabus.*—The Examination will include questions founded on such subjects as the following:—1. The elements of photographic optics; the photographic camera and its adjuncts, lenses, diaphragms, shutters, shades, &c. 2. A general knowledge of the practice and theory of the wet-plate process. 3. The practice and theory of the gelatine dry-plate process; the composition of and defects in gelatine dry plates. 4. Various methods of fixing, developing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed. 5. Silver printing, including vignetting and printing in clouds, toning and fixing. 6. Retouching and spotting; mounting prints. 7. The lighting of the dark room. 8. The studio and lighting of the sitter.

Honours Grade.

Candidates for honours must have previously passed in the Ordinary Grade.

The Honours Examination is both Written and Practical, and consists of two sections:—A, Pure Photography; B, Photo-mechanical Processes.

Candidates will be examined in *one only* of these two sections, and may select the particular branch of work in which they desire to be examined.

The fee for the Honours Examination in either section is 3*s.* 6*d.*

Section A.—Pure Photography.

I. *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—1. The theory of the photographic image, of development, fixing, intensification, and reduction. 2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography. 3. The principles of photographic optics. 4. The theory and practical use of sensitometers for testing the speed and gradation of plates, and their use in printing processes. 5. The general principles of various negative processes which have been employed at different times. 6. Platinotype, carbon, and pigment printing on argentic and bromide papers; enamels. 7. Enlarging and making lantern slides in the camera. 8. Applications of photography to scientific purposes.

II. *Practical Examination.*—Candidates may be examined in—(*a*) *Studio work;* (*b*) *Copying or Reproduction;* or (*c*) *Landscape and Architecture.* They will be required to show proficiency in conducting any of the following practical operations appertaining to the branch selected:—1. To take in a studio quarter-plate gelatine negative of some object to be indicated. 2. To take an artistic portrait. 3. To print, tone, fix and mount a silver, platinotype, or carbon print. 4. To test a sample of glass or fabric to be used in lighting the dark room. 5. To test the sensitiveness and gradation of a plate. 6. To find the focus of a lens either corrected or uncorrected. 7. To copy an engraving for a lithographic transfer. 8. To make make an enlargement from quarter-plate. 9. To make a lantern slide by contact. 10. To make in the camera a lantern slide from a negative.

The Practical Examination will be held on Saturday, May 4, between 1.30 and 6.30, and at other times, if found necessary.

Section B.—Photo-mechanical Processes.

(1) *Written Examination.*—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, a knowledge will be required of—1. The theory and practical use of different kinds of sensitometers. 2. The processes of photogravure. 3. The processes of producing "phototype" blocks. 4. The processes of photo-lithography and photo-zincography. 5. The processes of collotype (collographic) printing.

(2) *Practical Examination.*—Candidates may be required to show proficiency in practical operations in one of the above processes, numbered 2, 3, 4, 5, including the preparation of negatives suitable for each class of work, from (*a*) Pictures in colour, (*b*) drawings in monochrome, (*c*) originals in black and in tints, (*d*) natural objects.

The Practical Examination will be held on Saturday, May 4, between 1.30 and 6.30, and at other times if found necessary.

No Examination can be held at any centre except where arrangements for the Practical Examination can be carried out, or where at least *four* candidates notify their intention of presenting themselves.

The Written Examination in the Ordinary and Honours Grades will be held on Wednesday, May 1, from 7 to 10.

A separate return of the exact number of candidates who will present themselves in each grade, and in each section and branch of the Honours Grades, must be forwarded to the Institute by April 1.

II. *Full Technological Certificate.*—A Provisional Certificate will be granted on the results of the above Examination. For the full technological certificate in the Ordinary Grade, the candidate who is not otherwise qualified (see Rules 41–2) will also be required to have passed the Science and Art Department's examination in the elementary stage at least, and for the full certificate in the Honours Grade, in the advanced stage at least, in *two* of the following science subjects:—1, Practical, Plane, and Solid Geometry. 8, Light and Heat. 10, Inorganic Chemistry. 11, Organic Chemistry.

III. *Works of Reference.*—For the Ordinary Grade, *Chemistry of Photography*, Meldola (Macmillan); *Instruction in Photography*, Abney (Piper & Carter); *Manual of Photography*, Hepworth; *Practice of Photography*, Chapman Jones (Iliffe); *Art and Practice of Silver Printing*, Abney and Robinson (Piper & Carter); *Materia Photographica*, Leaper (Iliffe). For Honours in addition to the foregoing:—*Optics of Photography*, Traill Taylor; *Treatise on Photography*, Abney (Longmans); *The Chemical Effect of the Spectrum*, Eder; *Collotype and Photolithography*, Schnauss (Iliffe); *Photogravure*, Wilkinson (Iliffe); *Handbuch der Photographie*, Eder (Knapp, Halle); *Handbuch der Photographie*, Vogel (Berlin, Oppenheim); *Handbuch der Photographie*, Pizzighelli (Knapp, Halle); *La Photographie des Objets Colorés*, Vogel (Paris, Gauthier-Villars); *La Platinotype*, Pizzighelli, Hübl (Paris, Gauthier-Villars).

All communications on the subject of the Examinations in Technology or Manual Training, or the Inspection of Classes, to be addressed:

"City and Guilds of London Institute,
"Examinations Department,
"*Exhibition-road, London, S.W.*"

Croydon Camera Club.—The President will conduct an excursion to Tunbridge Wells to visit, by kind invitation of Sir David Salomon, the celebrated photographic studios, laboratory, and the various workshops, &c., at Broomhill. Train from East Croydon at 12.47 on Saturday, September 8, arriving at Tunbridge Wells at 1.50, where members of the Tunbridge Wells Amateur Photographic Association will join the party, which will then proceed by brakes to Broomhill.

News and Notes.

THE South London Photographic Society's Sixth Annual Exhibition will be held at the Public Baths, Church-street, Camberwell, S.E., on Tuesday, Wednesday, Thursday, Friday, and Saturday, 27, 28, 29, and 30, November, and December 1, 1894. Particulars may be obtained from William F. Slater (Hon. Assistant Secretary), 169, Southampton-street, Camberwell, S.E.

THE QUEEN AND SNAP-SHOTISTS.—In connexion with the forthcoming bazaar in aid of Crathie Church, some facilities are to be granted to the public to view the general apartments in Balmoral Castle. Precautions will, however, be taken to prevent the irresponsible photographer from securing snap-shots. Her Majesty is very jealous of her personal rights, both in Balmoral and Osborne, and permission to photograph the interior for purposes of publication has been granted very rarely indeed. If, therefore, an enthusiast with a Kodak should present himself at the door, he is politely required to deposit his umbrella and other luggage—whose purpose is studiously ignored—in the care of the *concierge*. One of Sir John Cowell's most regular duties from day to day was to indite letters refusing to distinguished foreigners and others permission to take sun pictures of the Queen's homes.

STANLEY SHOW, 1894.—The Stanley Photographic competitions, in connexion with the eighteenth Annual Exhibition of cycles, &c., will be held at the Royal Agricultural Hall, Islington, London, N., from November 23 to December 1 inclusive. Twenty medals (four gold) are offered for competition in the following classes:—(*a*) Landscape, with or without figures; (*b*) Hand camera work, set of four from negatives not exceeding 5×4; (*c*) Seascape or marine; (*d*) Figure studies, *genre*, &c.; (*e*) Portraiture; (*f*) Beginners who have commenced photography since January 1, 1891; (*g*) Cycling, for the best print taken by apparatus carried on a cycle; (*h*) General class, pictures not included in any of the foregoing classes, such as architecture, scientific, &c. With the exception of class (*b*) all the awards will be for one print only. The Manager of the Photographic Section is Mr. Walter D. Welford, 57 and 58, Chancery-lane, London, W.C., of whom full particulars can be obtained.

THE EQUATORIAL PLATE.—During the heated term of every summer, every photographer, amateur and professional, has been annoyed with frilling, puckering, or entire detaching of the film from its support. Alum, chrome alum, tannin, Epsom salt, ferric salts, the acid fixing bath, and a thousand other remedies have been recommended to counteract the evil. All that is very good in a measure, but, when the sun will insist upon pouring down upon us heat rays averaging from 95° to 100° in our latitude, those palliatives are but of little use, and the film comes off any how when water or developer are of more than 82° Fahr. Wuestner's newest invention is the Equatorial Plate, says an American contemporary, by which he means that it can be treated in every possible way, developed, fixed, and washed in the jungles of Central Africa, in Guiana, Sumatra, or Borneo, where at times the temperature is much above 120° Fahr., and the atmosphere is surcharged with moisture. The Equatorial emulsion stands well a temperature far above the highest a photographer encounters in his labours, in fact, boiling water of 212° Fahr. will not affect the plate or soften the film. It remains firmly and solidly upon its support, glass or celluloid.

PROFESSIONALS AND BAD TRADE.—*Apropos* of the recent correspondence on this subject in our columns, the following eminently sensible remarks appear in the last number of the *Photographers' Record* (Messrs. Elliott & Son, Barnet):—"The professional *v.* amateur question is again cropping up, and seems to be taking the form of an all-round squabble between professionals, amateurs, dealers, and manufacturers. We are not going to set ourselves up as judges in the matter; but, although there may be some cases where the amateur does actually take a photograph which, in the ordinary way, would have gone into professional hands, still the amateur has tended to make photography fashionable. No function is complete nowadays unless photographic records are taken of the event. This all means work for the professional, as very few amateurs can compete with the professional under such conditions. We fear that it is the general badness of trade that causes amateurophobia amongst professionals, and as soon as things brighten up a bit the whole question will be relegated to oblivion, only to be stirred up again when another run of bad times sets in. In the mean time, our advice to the professional is not to sit down and grumble, but be up and doing. Overhaul your work and compare it with the best work of others. Probe out the weak points of your work; try and introduce originality (we don't mean take people standing on their heads, &c.), but try different styles of printing, mounting, &c. As long as the professional photographer is content to wait for the trade to introduce novelties of design, how can he expect to rank above mediocrity? We hear the cry on all hands, We want something new in designs! What does this mean? Simply that photography, as practised by such people, is purely mechanical, and, if photography is reduced to mechanical work, then only mechanic's pay must be looked for. A true artist, whether painter, sculptor, or photographer, does not look to the tradesman for ideas; he originates, or at leasts attempts to do so. Let the photographer take advantage of the quietness of the times to think out his own professional salvation, and not wait for the quarterly visit of the commercial traveller for new notions."

IN *Autotype Notes* for September Mr. E. W. Foxlee points out that the appliances required for working the carbon process need only be of the simplest and most inexpensive character. "Let us consider the things necessary, *seriatim*. An actinometer of some kind is required for timing the exposure. Several convenient forms are in the market; but a very useful one may be extemporised by taking half a dozen narrow strips of thin white paper, each half an inch longer than the other. These are then gummed together, one on the other, at one end, and we then have a graduated screen, in steps, which can be numbered in ink from one to six. This, in a quarter-plate printing frame, with a slip of silver paper behind it, makes a capital actinometer for carbon printing. Pressure frame—any sort will do. The backs need not be hinged, but there is no objection to their being so. The next thing necessary in the work is a squeegee—a tool generally in the possession of every one now that highly glazed pictures are so much in vogue—and some even surface upon which to squeegee the exposed prints in contact with the support upon. A piece of plate glass is as good as anything. Any kind of photographic dishes, or other vessels, will do for the cold water, the bichromatic solution, and for the alum bath. A thermometer most people have. If not, a common bath or dairy thermometer can now be obtained at most chemists' for about a shilling. These instruments, though rarely correct, are always accurate enough for our present purpose. It is necessary that the tissue, when in the sensitive condition, should be kept dry and protected from the air. An ordinary cylindrical tin case answers well, but it will be a convenience in working if the tissue be kept flat. This can be done by keeping it tightly pressed in a printing frame; it will then be as perfectly protected from the atmosphere as if it were in an air-tight case. I think I have now got to the end of what is actually necessary for working in a small or experimental way, except something for developing the pictures in. It is obvious that any vessel that will hold hot water will serve; but, for convenience in working, it should not be less than four or five inches deep, and somewhat larger than the largest picture to be manipulated in it. A stout tin tray is very suitable, and, if it be supported on legs, or by any other means, a gas jet or a spirit lamp can be placed beneath, so as to keep the water from cooling. By the way, when in Germany last year, I saw some large enamelled iron trays in general use in the hotels and restaurants that would form excellent developing tanks, and would be very useful for many other photographic purposes if they could be had here in the same size. A good-size tea-kettle completes the outfit."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,410.—"Improvements in Photographic Cameras." Complete specification. J. TASCHER.—*Dated August*, 1894.

No. 16,586.—"Improvements in Photographic Mounts and Method of Making the same." F. W. HAYWARD.—*Dated August*, 1894.

No. 16,625.—"A New or Improved Process for Engraving Photographs and the like." T. REICH.—*Dated August*, 1894.

No. 16,693.—"Improvements in the Manufacture of Dry Coloured Plaques for Photography." E. DE CONINCK.—*Dated August*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN DETECTIVE CAMERAS.

No. 18,412. JETHRO MARSH, 49, Aytoun-road, Stockwell, London. *August* 4, 1894.

THE camera may be of rectangular or other form suitable for the purpose, and is preferably of small size, to admit of its being secreted in the sleeve of the operator, where it may be secured by a strap passing round the arm, or by other suitable means. A fixed focus, or other suitable lens, may be used, which may be adjustable for near objects. Any suitable shutter may be used for giving the necessary time or instantaneous exposures, but that kind known as "pneumatic" is very suitable. The compressible ball is attached to the piston barrel or other device for operating the shutter by means of the usual tube. The camera being carried in the sleeve, the tube extends preferably backward therefrom in the sleeve to a pocket or other place convenient, where it may be squeezed when desired. A stop-cock may be provided between the ball and the shutter for the purpose of closing communication except when the exposure is about to be made.

The camera has a magazine at its back, which may carry any reasonable number of plates or films, each contained in a carrier, made preferably of thin metal, which leaves the sensitive surface of the plate or film open, and which has a projection extending out beyond the said plate or film at one of its edges, by which the carrier and the plate or film it contains may be manipulated as hereinafter described. The magazine is an extension of the camera, and the plate or film-carriers are packed therein face to back. They are pressed toward the lens by a spring, and suitable stops or ledges maintain the front plate at the proper focus. Fitted with hinges to the open side of the magazine, there is a light-tight loose bag having its mouth over the projections on the carriers, of a depth and width at least equal to the length and width of a carrier. When the plate or film nearest the lens has been exposed, the operator, taking the closed end of the bag between his finger and thumb, grasps the projection on the carrier containing the exposed film or plate, draws it out from the front of the magazine into the bag, and transfers it to the back, finally pushing it between the spring and the last carrier, whose place it will then occupy, while the carrier containing the unexposed plate or film now nearest the lens will be pressed forward to the focus and be ready for exposure, the process of changing being repeated until all the plates have been exposed. The bag may be detachable from the magazine for storing the latter with charged carriers, or one of the sides of the magazine may open for the purpose.

Instead of a magazine like that described, I may use a roll-holder, and operate it from the front of the camera by any suitable means.

Any suitable view-finder may be used. This I attach to one side of the camera in such a way that it may be slided to or from it, and in a line parallel to the principal axis of the lens, and I may make it to turn on its sliding support in a plane at right angles to the principal axis.

When it is desired to use it, the finder is drawn out (its support sliding in ıe suitable guide or guides on the side of the camera) and held between the ngers of the operator; then, because the support is parallel with the principal xis of the lens, the camera will be in correct position for making an exposure hen the object to be photographed is seen in the finder. The turning of the nder on its support renders it more convenient to use.

Claims:—1. A photographic camera adapted to be carried in the sleeve of the perator, and there used for the purpose of taking photographic negatives or ictures. 2. In a photographic camera adapted to be carried and used in the leeve of the operator, a finder adapted to slide to and from the camera in a irection parallel to the principal axis of the camera lens, and rotatable in a lane at right angles to the said principal axis. 3. In a photographic camera dapted to be carried and used in the sleeve of the operator, the combination f a finder adapted to slide to and from the camera in a direction parallel to he principal axis of the camera lens, and rotatable in a plane at right angles o the said principal axis, with a magazine in which the plates or films are hanged by transferring them from the front to the back in a light-tight bag, nd a pneumatic shutter actuated by means of a ball and tube substantially as nd for the purpose described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
10	Norfolk and Norwich	
10	North Middlesex	*Orthochromatic Photography.* Messrs. Fuerst Bros.
11	Birmingham Photo. Society	
11	Great Britain	
11	Hackney	*Lenses.* H. Crouch.
11	Manchester Amateur	
11	Paisley	
11	Rochester	
11	Stockton	
11	West London	
12	Leytonstone	
12	Munster	
12	Photographic Club	
12	Southport	
12	Stockport	
13	Birkenhead Photo. Asso.	
13	Glossop Dale	
13	Hull	
13	London and Provincial	Lantern Entertainment: *A Day at Winchester.* Claud S. Scott.
13	Manchester Photo. Society	
13	Oldham	
14	Bristol and West of England	
14	Cardiff	
14	Central Photographic Club	
14	Croydon Microscopical	
14	Halifax Camera Club	
14	Holborn	
14	Maidstone	
15	Croydon Microscopical	Excursion: Reigate Park.
15	Hull	
15	Leytonstone	Exc.: Carshalton. Leader, W. J. Battell.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 30,—Mr. W. E. Debenham in the chair.

Collodio-chloride.

Mr. A. J. Brown said that at the previous meeting it was mentioned that Mr. Bruce, of Dunce, had long used collodio-chloride paper for printing. He (Mr. Brown) showed some of Mr. Dunce's prints which had been in his possession for eleven years. The prints were in a perfect state of preservation.

Mr. A. L. Henderson observed that Mr. W. Cobb had some collodio-chloride prints by Mr. Dunse twenty-five years old.

The Chairman, commenting on the tone of Mr. Dunce's prints, said that the late T. R. Williams got a similar tone on albumen paper.

Toning after Fixing.

Mr. A. Cowan said he had tried Mr. Henderson's toning after fixing method. For the unknown "feeble" acid he had substituted another "feeble" acid, which was two drops acetic acid B. P. The solution toned and fixed prints in six minutes. Omitting the acid from the bath, another print was toned in fifteen minutes. But the ammonium, sulphocyanide was, he had found, itself acid, and he believed that, so long as there was a trace of acid in the bath, it would tone. Mr. Cowan also showed platinum-toned prints, which had resisted the action of ferridcyanide and hypo better than gold-toned prints.

Mr. Henderson stated that the "feeble" acid mentioned in the formula he had given at the previous meeting was formic acid.

Zenotype.

Mr. E. J. Brown, of the Zenotype Company, Liverpool, who was accompanied by Mr. Abbott, the Manager of the Company, next gave a demonstration of the development and toning of partly printed gelatino-chloride prints, the depth of printing appearing to vary with the particular brand of paper employed. As an example, Lumière's Citos paper would require to be printed about a third of the depth as for gold toning. Zenotype is a powder packed in small tubes, and a quarter of a tube is sufficient to make ten ounces of solution. The prints when taken from the frame are placed without washing in the developing and toning solution, and when the desired depth of development and tone are reached, are then, still without washing, immersed in a plain hypo solution. Speaking of the permanence of the images, Mr. Brown said that he had exposed zenotype-developed and toned prints to the light for eight months, at the end of which time they were in the same state of preservation as at first. Others, again, had been found at the end of twelve months to be as pure in the whites as at the first. He believed that the paper became whiter than it was at first after going through the various processes. As to the influence of the depth of printing over the tone, he said that, generally, the deeper the print the redder the tone. The contents of one of the cartridges of zenotype powder (selling at sixpence each) were sufficient in his hands to tone 100 prints. The addition of a small quantity of solution of potassium or ammonium bichromate to the zenotype solution altered the tone to green or greenish brown. Answering a question put by Mr. Teape, Mr. Brown said that zenotype was capable of developing up invisible detail. A negative that took a day to print, if given an hour's exposure, would with zenotype produce a developable impression on gelatino-chloride. Zenotype had no effect on prints that were fixed and washed, and it was not applicable to albumenised paper. Of the gelatine papers for which zenotype could be used, citos wanted the least printing and development. The addition of acetate of soda to the zenotype solution produced a brown tone. Nitric acid improved the appearance of zenotype prints, whereas those toned with gold faded. Ferridcyanide and hypo, again, had no solvent effect on zenotype-toned prints. So far he had not had one complaint of fading with the process. Answering Mr. Haddon, he said the same colours could be obtained by washing between. He could not say whether sulphur toning took place in passing the print from the developer to the hypo. The developer was a neutral solution; it was probably neutral after use, and the prints went into a neutral fixing bath.

The Chairman here remarked that some papers are acid, and thus a print when put in the developer might have a considerable amount of acid in it.

Mr. Brown (continuing) said he believed that zenotype-toned prints would last longer than gold-toned prints. His experience, as on old albumen printer, was that chloride paper faded quicker than albumen. Zenotype, however, came to the aid of chloride paper, the developed image on which, he thought, would be more lasting than the printed-out image. Long immersion in the hypo bath reduced the tone very little, for the imitation gold tones could be obtained by the addition of alum to the hypo bath. On separate portions of one print, in fact, he could produce fifteen different tones. When once the hypo got to the print, there was no chance of its developing up.

During the evening a large number of specimens of zenotype developed and toned prints, matt and glossy, and having a remarkable r nge, and variety of tone varying from warm red to a dark purplish brown, were passed round, and much admired for their beauty and richness. Mr. Brown and Mr. Abbott (the Manager of the Company) developed and toned a number of prints in zenotype, both with and without the addition of the bichromate, successfully producing a number of excellent results.

At the conclusion of the demonstration, the Chairman, in proposing a vote of thanks to Mr. Brown and Mr. Hatton, threw doubt on the assumption that developed images were more permanent than printed-out images, particularly if the former developed up red. He thought sulphur-toned prints should be avoided if possible, and hoped at a future date to detail some experiments in support of his view.

PHOTOGRAPHIC CLUB.

August 29,—Mr. E. W. Foxlee in the chair.

The Hon. Secretary read a letter from the Exhibition Committee of the forthcoming Exhibition at the Royal Aquarium asking if the Club would send down slides for show.

Mr. F. A. Bridge moved, and Mr. M. L. Troup seconded, that a reply be sent that the Club did not see its way to send slides for exhibition.

Mr. J. Nesbit showed film negatives taken in a Frena hand camera at Antwerp. They were out of focus. He also showed a picture of himself in Soudanese costume, in which he looked very formidable.

The question arising as to whether collodio-chloride paper is still selling, it was said that it was not having anything like a sale. One reason given was, that when dry the surface cracked on being flattened out.

Mr. Nesbit asked what was the best method for removing the surplus water. Blotting off with blotting-paper was suggested, but Mr. Nesbit said the "fluff" left behind was almost worse than the surplus water.

Mr. G. W. Tottem recommended the "Buvard Blanc," sold by Messrs. Marion, as it was quite free from fluff and chemically pure.

On the question of permanency of gelatino-chloride and collodio-chloride, the Chairman said that time had shown that collodio-chloride was the most stable of all the silver methods.

Mr. Parfitt asked for the method of obtaining the equivalent focus of a combination of two lenses of known foci.

The Chairman said it was this: Multiply the focus of one lens by that of the other, then add the foci of the two together, and from this deduct the distance of separation, and then divide the first sum by the latter.

Croydon Camera Club.—The meeting on Wednesday, August 29, was devoted to the demonstration of a new developing formula, which Mr. G. R. White has discovered to be very advantageous, especially for under-exposed plates. Two whole plates, which had received one-eighth the calculated normal exposure, were developed before members in the Club's laboratory and dark room. The image appeared in about seven seconds, development being complete in about

one and a half minutes. The resulting negatives appeared to possess sufficiency of detail, also promising density and graduation.

Hackney Photographic Society.—August 28, Mr. J. O. Grant presiding. Members' work was shown by Messrs. Dean and Sodeau. After various reports and announcements had been made, Messrs. Brown and Abbott, of the Zenotype Company, were called upon to explain and demonstrate the zenotype process. Mr. BROWN said that this process was the outcome of experiments made by him some years previously with aniline dyes for colour reproduction. It was both a developer and a toning process, and was suitable for all kinds of gelatino-chloride papers, but not for albumenised paper. About fifty different shades of colour could be obtained, through red, purple, brown, green, and black. So great a variety of tones being obtainable, it was easy to suit the tone to the subject—an obvious advantage. It was a very cheap process, a sixpenny tube being sufficient to develop and tone one hundred half-plate prints. After four years' experience, he claimed it to be absolutely permanent. In this regard, independent experiments had been made; prints toned with zenotype had been placed in a sunny window for twelve months, and had shown no change whatever. The working instructions were as follows:—Dissolve one quarter of the contents of a cartridge of zenotype powder in ten ounces of water. The depth of printing necessary varies with the result or tone required, but, for general work, the printing should be about as deep as a finished result. The prints should be immersed without washing in the Zenotype solution until the shadows are almost black, and then transferred to the fixing bath of hypo, 3 ounces; water, 20 ounces. The colour changes at first, but gradually returns. After fixing, which takes about five minutes (although a longer immersion will do no harm), the prints should be washed thoroughly for about two hours, and then squeegeed, or dried in the usual way. With the above baths some very fine tones can be obtained, but, when greater variety is required, some drops of solutions of potassium bichromate, ammonium bichromate, or acetate of soda, may be added to the developing solution. The chromium solutions are made by adding four grains of the respective salts to four ounces of water. Acetate of soda produces dark brown tones, and the bichromate various dark tones to pure green. Mr. Brown, in refuting charges against the permanency of the process which had been made in a monthly periodical, said that zenotype solution was neutral to test paper, and so no sulphur toning could take place when in fixing bath. If a print, developed and toned with zenotype, were placed with a print toned with gold, and both were immersed in a solution of nitric acid, 1 minim; water, 1 ounce, the gold-toned print would fade, while the other would be improved. This supplementary acid bath was included in the first instructions issued with the zenotype powder; but, as some objections had been made to the use of the acid bath, it had been discontinued, although he (Mr. Brown) had found no ill effects to arise from its use. By its aid, some good cold tones could be produced. At the demonstration, some fine results were obtained on Ilford P.O.P., Solio, Citos, and Otto papers. After toning and developing a number of prints, Messrs. Brown and Abbott invited some of the members present to try the process there and then. Accordingly, Messrs. Westcott and Wilks toned some prints with successful results. From the demonstration, and the beauty of some of the examples exhibited, it was clearly shown that Zenotype was a most easy, interesting, and promising process.

Leytonstone Camera Club.—On Saturday last one of the most interesting outings of the season took place, when, in conjunction with the Walthamstow Photographic Society, the above Club visited the Tower of London. A large number of plates were exposed, the various towers and the old stone gateways, with the warders in their picturesque dress, giving plenty of scope to the workers. Saturday, however, admission being free, is not the best day for visiting the Tower, as it was found quite impossible to photograph some parts owing to the numbers of visitors constantly on the move. A good view of the Tower Bridge can be obtained from Tower-walk, and the Thames, looking westward towards London Bridge, makes a picture not to be despised. On Saturday next the Club visits the "Hollow Ponds," under the leadership of Mr. G. E. Cox. The members will assemble at Leytonstone Station at three o'clock.

North Middlesex Photographic Society.—On Monday, August 27, Mr. BIRT ACRES, of Barnet, attended and gave a demonstration on *Carbon*. The demonstration was intentionally of the rough-and-ready method, the intention being to use only such appliances as are ordinarily to be found in even the most modest amateur's abode. They consisted of three dishes, rather deep, and two large jugs, one of hot, the other of cold, water (or hydroxyl, &c., as Mr. Acres called it). He briefly sketched the history of the carbon or pigment printing process, not dwelling upon it very long, but simply to give those of his hearers who were totally unacquainted with the subject some slight knowledge of the vehicle to be employed. He then proceeded to develop some single transfer prints, explaining the while the reason for every movement, the preliminary soaking of the tissue, the right time to take it out of the water, viz., when the print begins to show signs of curling outwards, the squeegeeing to the support, the blotting and drying, and, lastly, the developing by means of the hot water. His proceedings were closely watched by the interested members, as also further on when he proceeded to the double transfer. The ease with which the different operations were performed seemed greatly to impress the audience; and, when Mr. Acres offered some two dozen packets of tissue for distribution and trial, many were the hands stretched out for them. The results of the trials are to be brought up in a fortnight's time. The Annual Exhibition of this Society has been fixed for December 3 and 4.

Liverpool Amateur Photographic Association.—August 30, Mr. Alfred Tyrer (President) in the chair.—Messrs. E. H. Higgins, Henry Pentony, and H. E. Overbeck were duly elected members. The CHAIRMAN announced that during the winter session Mr. Fred Anyon had consented to give a series of eight lectures and practical demonstrations. These lectures have been prepared, and are specially intended for the help of beginners. The excursions which had recently taken place were reported on as very satisfactory events.

FORTHCOMING EXHIBITIONS.

1894.	
Sept. 11–Oct. 6	*Royal Aquarium.
,, 17–21	*Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	*Royal Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1	*Stanley Show (Photographic Section).
,, 29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December.....	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.

Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is tak of communications unless the names and addresses of the writers are given.*

TONING AFTER FIXING.

To the EDITOR.

SIR,—In your report of the meeting of the London and Provincial Photographic Association, which appeared in your last issue, an important error has crept in regarding the amount of gold in the toning bath. It should read:—

Ammonium sulphocyanide	100 grains.
Water	10 ounces.
A feeble acid (formic)	240 minims.

(Chloride gold, 1 grain, to distilled water ℥iij. One drachm = ¼ grain gold, not 3 grains of gold to 1 drachm of water.)

My object in not giving the name of the acid was to induce members to try various acids, as doubtless other acids may act better than the formic. I would suggest benzoic, or tannic, or even gallic acid. I dare say the latter would act as a reducer or developer, should the prints be under-printed. It says a great deal for the permanency of the collodio-chloride prints, seeing that there is no case of fading known, and prints shown at the meeting were pronounced by the Chairman "as perfect as if they had just come from the printing frame," although done many years. I may mention that the prints I experimented on were printed on paper prepared by the Paget Prize Company, and quite equal to any "made in Germany." It was interesting to see how the *dried* collodio-chloride prints resisted a prolonged attempt to reduce by ferridcyanide and hypo, and even the toning, but if the prints have not been dried they tone and fix *much quicker than any gelatine prepared paper.*

Formic acid has long been known as an accelerator in developing wet-plate negatives in conjunction with pyro. I believe the late Claudet was the first to advocate its use, and, bearing this in mind, I have been experimenting with formic preparation in dry-plate developers. Here is a formula that has given wonderful effects regarding rapidity and density:—

No. 1.

Soda sulphite	2 ounces.
Hydroquinone	150 grains.
Boiling water	20 ounces.
Lead formiate	Saturation.

No. 2.

Soda hydrate	120 grains.
Water	20 ounces.

For use, mix equal parts of Nos. 1 and 2.

If the formiate of lead is dissolved in distilled water, it will not cause a milky precipitation when mixed with the alkali, but a precipitate will not do any harm. If I am not mistaken, a precipitate of lead (by this decomposition) is soluble in excess of alkali. If so, then it might follow that it would be better to saturate the alkali with the formiate of lead also. Text-books give the solubility of formiate of lead as one in forty, but I have not been able to dissolve so much. I believe that a wide field is open for experiment. I can only express regret that I cannot continue my experiments all through the winter, having to leave England for a more genial climate next winter. I think of wintering in Algiers. I will be pleased to receive any hints from any of your readers *re* climate and photography.—I am, yours, &c., A. L. HENDERSON.

The Paragon, Bournemouth, September 2, 1894.

KEEPING QUALITIES OF PLATES.

To the EDITOR.

SIR,—Upon August 22, the day of our annual regatta, I was exposing a few plates from my window, which overlooks the course, and was tempted to use up more than I at first intended. I soon found myself out of whole-plate (the size I was using) and was unable to procure in time a fresh supply. Remembering that I had packed away a dozen which had been in my possession several years, and which I had reckoned useless through age, I filled the slides with some of them considering in my own mind that I was simply wasting time and developer in the attempt. The result, however, was so good that I think you will be interested in seeing the result. I wrote to the makers of the plates to inquire upon what date this batch was made, and they inform me that batch 866 was coated on May 20, 1887, so that they were over seven years old. Since that time there has been a general all-round improvement in the quality and rapidity of plates, and no doubt their present turn-out would be an improvement upon these.—I am, yours, &c., H. J. GODBOLD.

White Rock-place, Hastings.

THE COUNTY COUNCIL AND PHOTOGRAPHERS.

To the EDITOR.

SIR,—In your remarks on "Vanishing London," you observe that "This kind of work might form part of the duty of the official photographer of the County Council."

Are you aware of the fact that those unfortunate officials (the O.P.'s not the C.C.) are compelled to perform their duties *gratuitously*? Yet, such is the fact. I was informed by one who is in a position to know, that the Council, on deciding to have all their *lunatics* photographed (fancy taking a score or two! I would like to see the results), looked around their officials for guileless ones, and persuaded them to accept the offer and to trust to them (the C.C.) for remuneration.

The C.C. discovered at the interesting time when the remuneration was due, that they had no authority to pay such an official. Thus, these guileless ones are left to do the work for *nothing*. Oh, glorious C.C., that always pays a fair day's wage for a fair day's work, and *never, never* sweats its *employés!* May you live till election day!—I am, yours, &c. J. B. S.

ILLUSTRATED PRESS AND PHOTOGRAPHERS.

To the EDITOR.

SIR,—We have had a somewhat varied experience in our dealings with the illustrated papers, but think the case we now mention beats all record.

In August, 1893, we received a letter from the editor of the *Law Gazette*, asking our permission to reproduce a photograph of a certain judge. We gave gratuitous permission, and a silver print. Two days afterwards came a second letter, asking for the loan of the negative. As we had then no reason to believe the journal was conducted on other than the usual principles, we forwarded negative, together with letter, saying we loaned it for three weeks; if scratched or damaged or not returned to time, we should charge 25*s*. The negative was not returned, and we made repeated application for the amount; we received no reply to any of our letters, so placed the matter in the hands of our solicitors. Within a few days they received a 12×10 negative of some one in barrister's dress. Our solicitors advised them that the negative sent was not the right one, ours being a half-plate. So far, we have heard nothing further from the very courteous (?) editor of the *Law Gazette*. Our little kindness to the illustrated press has, in this instance, cost us, in addition to stamps and stationery, one cabinet photograph, the half-plate negative of a good client, carriage thereon, solicitors' charges for two letters.

The next time the *Law Gazette* apply to us for a negative, we shall require pre-payment. It is evident they are systematically careless, or they would not have sent to us a negative which presumably is the property of some other photographer. We trust this letter may be the means of reminding the owner of his loss. Portrait is a good three-quarter length sitting.—We are, yours &c., ALFRED COX & CO.

Nottingham, August 29, 1894.

"AMMONIA."

To the EDITOR.

SIR,—In reference to the interesting paper on "Ammonia," read by Messrs. F. B. Grundy and A. Haddon at the London and Provincial Photographic Association, I beg to remind your readers that, in an article in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1886 (p. 187), I showed the fallacy of designating the ordinary strong ammonia liquor of commerce by 0·880 sp. gr., and recommended that a strength corresponding to 0·890 sp. gr. should be adopted by both makers and buyers.

The new table of specific gravities of solutions of ammonia by Lunge and Wiernik, referred to by Messrs. Grundy and Haddon, will doubtless be more reliable than that of Carius, to which I gave preference over the then existing tables when I wrote the article.—I am, yours, &c.,

J. H. SMITH, PH.D., F.I.C.

Wollishofen, Zürich, August 28, 1894.

IMPROVEMENTS IN HALF-TONE NEGATIVES.

To the EDITOR.

SIR,—In last number of THE BRITISH JOURNAL OF PHOTOGRAPHY to hand (May 25), I have just read specification of patent completed No. 20,342, by Frederick John Mathew Gerland, for improvements in half-tone negatives. This improvement which he has patented I found out, and have been working since 1892, in which year I did an illustrated catalogue of pictures for the Otago Art Society's Exhibition, and will endeavour to get one and send you so that you may see that it was done as long ago as I say. I may mention that I did forward one to Mr. A. L. Henderson in the beginning of 1893. I enclose herewith two or three prints to show you that my improvement is identical with Mr. Gerland's, and you will see that the highest lights are quite white. The prints I send are printed from stone, as was the catalogue; but the general run of lithographic printers here are not up to this fine printing.

I send you this so that you may see that Mr. Gerland was not the first to find out the improvement in half-tone negatives that he has patented.—I am, yours, &c., W. R. FROST.

78, *George-street, Dunedin, N.Z., July* 10, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange large portrait lens, four inches diameter, for good studio camera or enlarging lantern.—Address, J. PARKER, 106, North-street, Colchester.

Wanted half-plate wide-angle lens, in exchange for Marion's five guinea embossing press and four dies.—New address, W. WALKER, Scotholme, Nottingham.

Pair of backgrounds 8×6 on canvas, flatted oils, new and perfect, exchange for good violin, poultry, or canaries.—Address, W. G. HARE, Photographer, Sutton, Surrey.

Will exchange Optimus japanned, full-sized lantern and fifty slides, for good whole-plate portrait lens or first-class carved table.—Address, GEORGE MOORE, Buckfastleigh, Devon.

Adams's pneumatic shutter, for studio use, offered for really good pair of opera or field glasses (high power).—Address, R. H. STEVENS, The Hendon Photographic Studio, N.W.

Exchange Ross No. 1 Universal for Fallowfield's Facile (with rapid rectilinear lens), or other good hand camera.—Address, KENDAL BINDLEY, 104, Mercers-road, Tufnell-park, N.

Optimus whole-plate burnisher in good condition. Will exchange for light clouded background in good condition or nice interior.—Address, A. DURN, The Studio, Wotton-under-Edge, Gloucestershire.

Studio camera, whole-plate, mahogany, forty-inch bellows, two dark slides, and enlarging stage. Exchange for whole-plate field camera.—Address, D. P. PRIMROSE, Post Office, Fawcett-street, Sheffield.

Will exchange Beck's whole-plate, iris, rapid rectilinear and Marion's whole-plate, wide-angle rapid rectilinear, rotating stops, and cash, for similar lenses (12×10).—Address, E. A. BASCHE, 234, Mill-road, Cambridge.

Exchange 8×10 rolling press, Tyler's sunlight lantern slides, carrier, &c., every accessory for oil and limelight, also twelve-feet sheet, for 12×10 burnisher or good half-plate camera outfit.—Address, HARRY EBURY, Artist, Kidderminster.

Wanted, background, interior, in exchange for a new tall step stand, adjustable, very useful for taking photographs over the heads of a crowd, or other purposes where a tall stand is necessary.—Address, H. BUTTRUM, 94, Bullingdon-road, Oxford.

Folio of high-class water-colour drawings, by exhibitor, also fine selection of drawings by the late H. Lines, of Worcester, who has pictures now hung in the permanent gallery, Birmingham and South Kensington, exchange quarter or half-plate camera, stand or hand; approval.—Address, A. MILLS, 173, Hoole-street, Walkley, Sheffield.

Wanted, 15×12 or 12×10 light, modern outdoor camera, rapid rectilinear lens and stand; exchange 15×12 best portrait lens and camera, modern, all movements, as new; or lantern slides, or handsome plate-glass show-case (equal to small shop window), and large slow-combustion heating stove with piping and fittings complete.—Address, J. LONSDALE, 45, Stroud Green-road, N.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

PHOTOGRAPHS REGISTERED :—

John Ross Browning, Exeter.—*Five photographs of the Bishop of Exeter.*

Edward Peter Adams, Greenwich, S.E.—*One photograph of Miss Ethel Brooks.*

Arthur James Langton, 35, Buckingham Palace-road, S.W.—*Photograph of Hugh Howell Scott, Esq.*

James Jarrett, Keynsham, Somerset.—*Photograph of the old Crown Inn, Keynsham, pulled down in* 1893.

Kate Crook, Keynsham, near Bristol.—*Photograph of the late Mr. John Powney, of Lansdowne, Bath, aged eighty-six.*

Walter George Lewis, Bath.—*Photograph of the Lord Bishop of Bath and Wells (Right Rev. G. W. Kennion, D.D.).*

Abraham Squibbs, Bridgwater.—*Photograph of E. J. Stanley, Esq., M.P. for Bridgwater, and his eldest son, taken on the son's twenty-first birthday.*

A. SKENE.—Carbonate of soda is meant.

H. L. MOREL.—Communicate with Mr. Geo. Pendry, Nottingham.

W. GIRLING.—1. The pure crystallised carbonate of soda, such as that you refer to, is meant. 2. It is a purer article.

A. H. STEEL.—Surely you do not read the JOURNAL, or you would have seen an article last week that answers your query fully.

PHOTO.—It is the oxyhydrogen limelight that is used for the purpose you name. Communicate with Mr. R. R. Beard, Alscot-road, Bermondsey, S.E.

W. HUNT asks the address of Mr. Alfred Maskell, the Hon. Secretary of the Photographic Salon. — The address is, Dudley Gallery, Egyptian Hall, Piccadilly.

B. H. B.—We cannot recommend soaking the fading prints off the mounts and rewashing them. We have known cases when this was done; where the fading, instead of being checked, was really hastened.

PICKWICK.—As the collotype plate does not take sufficient ink to give a good print, it is probably under-exposed; or, maybe, it is made too damp. These are two of the most prolific causes of this trouble.

J. M. WILSON and QUICK A. LAING will find details of the processes about which they seek information in our ALMANAC for 1893, or in Burton's book on *Photographic Printing Processes*, published by Marion & Co.

PIGMENT.—The cause of the trouble—the carbon prints not adhering to the rough drawing paper during development—is, so it appears to us, that the paper is insufficiently sized. Try the effect of giving it another thin coating.

M. D.—If the paper has been exposed to the fumes from a foul drain, it will fully account for its discolouring so quickly. The ordinary brands of ready-sensitised paper can usually be depended upon for keeping some weeks after preparation.

E. L. J.—The cause of the "peculiar appearance" in the lens is, that the balsam between the glasses has cracked. It is easily remedied. Send the lens to a practical optician—the maker by preference—and he will rebalsam it for a small charge.

CORNWALL.—The quickest lenses made specially for hand cameras have an aperture of *f*-5·6. If a quicker one than that is required, one of the Petzval, or portrait, form will be best. Lenses of this type, under the name of Baby lenses, may be had with an aperture of about *f*-2½ or *f*-3.

W. Y. G. says: "In a recent number of the JOURNAL you had an article on 'Incandescent Gas Lighting,' and you there stated that a new unbreakable mantle was being made. Can you inform me where this is to be had?"—Inquire of the Incandescent Gas Lighting Company, Palmer-street, Westminster.

T. E. D.—From the description, the lens seems to be an old one of French make, as it has no name upon it. However good it may be, it has but little commercial value. Some of these old portrait lenses will take very good pictures, particularly if they are used with a stop, which the rapidity of modern plates will admit of.

A. H. C.—It must be an error. If we mistake not, our old correspondent, Mr. Carey Lea, was the first to introduce "Schlipps Salt" as an intensifying agent for negatives. Anyhow, in his *Manual of Photography*, published in 1871, he speaks of having introduced it some years previously. Whoever introduced it is now of small moment. It is a good intensifier.

A. MCLEOD (Berwick).—As you work only as an amateur, and as such only on a small scale, we question, at the present low price of silver, whether it will be worth the trouble to save the washings from gelatino-chloride paper. They contain but little silver, and unless a large quantity of paper is used, the return will be exceedingly small, and will not repay the trouble.

SEASIDE VISITOR.—As the makers of the mountant have not published the formula by which they compound it, we cannot give it. The only way to get it is to ask them to give it to you, if they will. There is no mounting solution that fulfils your conditions, unless the prints are mounted while they are on the glass. Then any of the well-known ones, such as starch paste or gelatine, will answer.

J. WALTHAM.—A stock solution of pyrogallic acid, if made with the usual proportion of sulphite of soda, will keep good for a good time if not exposed to the air. The best way of keeping it is, as soon as it is made, put it into small bottles, quite filled, and cork tightly. In this condition it will remain good for years. You will find this a good way; to take the solution on your travels, if you prefer to take a solution instead of the pyro.

W. COWARD.—If the view faces due north, and it must be taken near about midday, a day should be selected when there is no sun shining, but still good light. At this time of the year, when the sun is low, we fear there is no efficient way of shielding it sufficiently from the lens to get a good negative. A better result may generally be obtained by taking a picture without sunshine than when the sun is shining full in the direction of the lens.

R. G. WEST writes: "Will you be so obliging as to say (if this has not been done in last Friday's number, which, in travelling, I have not yet seen) whether, in the formula given for a one-solution metol-hydroquinone developer, crystallised or anhydrous carbonate of soda is intended? The formula was given in an article entitled, I think, 'Rational Development' in your issue of the 24th inst."—In reply: The ordinary crystallised carbonate was meant.

A. G. (Belfast) writes: "Would you kindly say, in next week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY, what way you think best to precipitate washings of gelatino-chloride and collodio-chloride paper? I put the washings of both papers into one vessel, and have used hydrochloric acid, but find it does not precipitate the silver. I have used it for years for the washings of silver paper (albumen), and found it to answer very well."—Try the addition of a little nitric acid and a vigorous stirring. We frequently have complaints similar to this; perhaps some reader can further assist our correspondent.

C. H. says: "I beg to ask three questions, and should be glad if you would answer them in your next issue, if possible:—1. In making up opalines how is the spotting done? 2. In making up opalines, with what is the back stuck on? 3. Is the back stuck direct to the photograph or is there paper put between? I may say, as regards 2, I use glue, but that does not answer."—1. Colours are sold specially for the purpose, or ordinary oil colours, as used by artists, thinned with turpentine, may be used. Sometimes the spotting is done with lead pencil, when that matches the colour of the print, or nearly so. 2. A thin solution of glue is what is generally used. 3. Usually cemented direct on to the back of the print.

ANXIOUS TO LEARN says: "1. Would you please let me know what is the best material to use for sizing calico to make it in a proper condition to paint backgrounds in flatted oil, so that they can be rolled up without their cracking? 2. And is there any process by which I can make the colour take longer in drying? I make it as you recommended me to, viz., three parts turps and one part gold size, but it dries before I can get all the effects in?"—1. Common single size of the oil shops. 2. The work should be done expeditiously. The drying may be retarded by the addition of a larger proportion of gold size, or a little "boiled oil," but if too large a proportion of either be used the work will dry with a gloss.

D. MICHELL writes as follows: "Occasionally I am much troubled with spots on my prints, and whenever this happens I notice that the water, as it comes from the tap, is decidedly yellow or light red. Two or three days ago it was a strong red, and the following morning the prints were all spoilt from innumerable minute spots. I communicated with the water company, and was informed by an inspector that on that day they had been repairing the pipes. Do you think the iron rust in the water was the cause of the spots, and, if so, may not the mysterious spots that others sometimes meet with proceed from the same cause?"—We think there is little doubt that the particles of oxide of iron in the water were the source of the spots, and that similar conditions are the cause in many other instances where the trouble cannot otherwise be accounted for.

DOUGLAS PIM asks: "Can you tell the average strength of (or candle power) electric light required for ordinary studio work? A Company are shortly laying a main along this road, and those people requiring a supply for the coming winter must give notice at once. The charge in my case, I understand, is according to the power of lamp. As regards the latter, as far as my knowledge goes, Messrs. Gwynn & Co. (Pilson arc lamp) seems to be very good, but so very, very expensive (28*l.* for 6000 candle-power light). I do not think I require so strong a light. Any information will be very much esteemed."—Where the electric light is used, one of from 6000 to 10,000 candle power is generally employed. A smaller light can, of course, be used, but, of course, only at the expense of longer exposure. The sum mentioned, we believe, includes reflector and its necessary fittings and adjustments.

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PHOTO-FILIGRANE, WATERMARKING, AND TRANSPARENCIES.

Probably many of our readers have seen porcelain window transparencies, a class of art work more common in pre-photographic days than it now is. They are constructed of diaphanous china, the variations in light and shade being obtained by the inequalities in the thickness of the slab of material. They are characterised by a very charming softness combined with a fair degree of both vigour and sharpness, and are still occasionally to be met with in toy and fancy emporiums.

Several years previous to the lamented death of the late ingenious Walter B. Woodbury, it occurred to that gentleman that similar effects might be obtained by the agency of gelatine reliefs; and after much experimenting—for Woodbury never relaxed his grip on an idea until he had mastered its possibilities and capabilities—he was enabled in 1867 to conjoin nature-printing and photo-relievo in such a happy and simple manner as to elicit the admiration of the *cognoscenti*.

But previous to proceeding farther it may be desirable that we explain in what nature-printing consists. It was a discovery made by an engraver in Nuremberg about 1750, that if any object, such as a dried leaf, or other equally delicate thing, were subjected to severe pressure between a plate of polished hard steel and another of softer metal, such as lead, the delicate object, instead of being crushed out of all shape as might naturally have been expected to be the case, embedded itself in the softer plate of the two between which it had been placed, and the plate thus engraved could be used for making prints by the copper-plate or intaglio printing process in which all the finest details of the object were preserved.

The ordinary Woodbury printing process is in a measure analogous to this. A relief is made in bichromated gelatine, and, when dry, it is forced into a thick sheet of lead, from which prints are obtained by filling up the hollows with an "ink" composed of coloured gelatine, this being set off upon a sheet of paper pressed flatly in contact while the ink is still fluid, and which, when stripped off after partial solidification, carries off the ink which forms the picture. This rough outline will enable what follows to be understood.

A plate of glass, having been coated with a tough, plain collodion, is placed on a levelling stand, and receives a thick coating of gelatine, composed as follows:—

Gelatine	1½ ounce.
Sugar	½ „
Bichromate of potash	20 grains.
Water	4 ounces.

This, having been liquefied, is poured upon the glass to the height of one-eighth of an inch. When dry, this combined pellicle is stripped off the glass, and is exposed to light under a negative, the collodion side being placed in contact. When sufficiently exposed, the non-actinised portions are washed away by means of tepid water, and an image is produced in which the lights are depressed and the shadows raised. The glass is so prepared as to permit of the stratified film being readily stripped off when dry.

This relief film is next laid upon a thin hard metal plate with a polished surface and a sheet of paper superimposed. The whole is then passed through the rollers of an ordinary rolling press, under considerable pressure.

The quality of the paper influences the result. If it is hard and thin, the effect is not so bold as when it is thicker and partakes of a certain sponginess of texture, with as much opacity as possible. For it is to be borne in mind that the action of the relief film is to impress itself in the surface of the paper under such conditions as to leave the paper intact in thickness, or nearly so, in the deepest shadows, while in the lights the pressure has to be so great as to squeeze the paper into extreme thinness, thus transmitting the maximum of light.

By attaching the relief pellicle by its collodion side to one of the rollers of a rolling press, and gearing the roller with a foot lathe, an operator can feed in the paper with one hand, using the other hand for removing the embossed sheet, and thus turn out these relief or "filigrane" transparencies at a rate exceeding a dozen per minute.

The application of this to "watermarking" rather for a time alarmed bankers and others, whose security in the prevention of forgery lay in the watermarking of their valuable papers. It was, however, shown that by steeping a photo-filigraned paper in water for a short time the impressed watermark absorbed water and again swelled, thus obliterating the markings, or sufficiently nearly so to prevent their being readily seen.

ARE GOLD RESIDUES WORTH SAVING?

It has been suggested that an article on this topic would be a useful addendum to our observations upon platinum residues a fortnight ago. As to whether gold waste is usually considered worth the trouble of collecting, no doubt can be felt: very few photographers throughout the kingdom take any steps whatever to save it. This fact, however, in view of our often-repeated remarks upon hypo-saving, cannot be considered of any value in the argument, and what we have to consider is whether it would be advisable for them to change their opinions or awake from their lethargy on such important points.

A few years ago there could be but one answer to this query: gold residues were well worth saving when alkaline gold toning was the almost universal practice. But with the introduction of sulphocyanide baths a more complex problem is presented. First, dealing with old toning baths, we may at once say that there is nothing worth the trouble of saving in the washing water after toning; but that the baths themselves, whenever they are rejected, which, perhaps, is not often, contain a considerable amount of gold, although the solution is apparently exhausted. The actual mode of collection is simple enough. All that is necessary is to collect all the waste gold solutions in a suitable vessel, and then to add a solution of sulphate of iron. The precipitating solution should be previously filtered, so as to cause the precipitate to be as free as possible from foreign matter. In a very short time after the addition the gold will begin to precipitate, but in a manner quite different from silver chloride. The deposit is of an extremely fine nature and is very light. When first produced the solution assumes a colour rather violet in tone, and it needs to remain entirely undisturbed for a day or two. The supernatant liquid may then be decanted, and the slight brown deposit transferred by stirring it into the slight quantity of liquid that was not removed and pouring it into a small filter, and then well washing it by pouring repeated changes of water into the filter as the previous change filters away. Some careful workers prefer to subject the gold deposit to the action of a little pure hydrochloric acid to take up any iron that may have been thrown down while the jar was standing. The precipitate is then washed as before till quite free from iron or acid. We then get a fine mud upon the sides of the filter, which can be collected by drying, and sent to the refiner, filter and all. But it is far better to dissolve it and make chloride of gold direct—a very simple matter with gold powder. The filter should be well dried and then burnt over a piece of white paper, so that no waste takes place, and then weigh ashes and gold together. The former will be so slight in weight as to be disregarded, but, if extreme accuracy is required, it will be desirable to burn to ashes a new filter paper of corresponding size, and subtract the weight of the ashes so produced from the total weight of gold and paper obtained as described. When the solution is made in the manner often described by us, it may be reckoned as two grains of chloride for every one grain of gold. We should add that when collecting the waste solutions it will be advisable to pour *aqua regia* into all empty bottles that have been used for containing gold or gold toning solutions, as under the action of light gold is continually being deposited upon the inner surface of the vessels, unless the solution be very acid. The liquid so obtained may be added to the waste stock; but, when the iron is added, care must be taken that the whole solution is not too strongly acid.

If these instructions are carried out, a noteworthy quantity of gold may be annually saved.

With regard to the precipitation of sulphocyanide baths, we are not aware of any practical data having been published, and in the few cases where they are saved they are added to the waste hypo solutions, and thrown down along with the sulphide of gold. It is useless trying to precipitate with protosulphate of iron, besides which the sulphocyanides react so strongly with very minute quantities of per-salts of iron that the deep colouration produced by even the small proportion present in ordinary sulphate might be expected to mask all other reactions. It is, of course, true with this, as with hypo containing traces of gold from toned prints, that the precipitated sulphide of gold is soluble in the solution of liver of sulphur, and, indeed, in water itself; but, in the dilute state it would be in with these solutions, it would probably be found that the whole of the gold goes down with the silver precipitate. There is no doubt whatever that some goes down, for the refiner will allow several pence per ounce more for silver from this source than that from print washings.

In conclusion, we may say that we strongly advise every one to save his gold in the manner described—alkaline toning solutions to be thrown down with iron salts, and sulphocyanide and double toning-fixing solution to be added to the waste fixing solutions, and the result of one year's trial will show conclusively that gold residues are worth saving.

FIXED ALKALIES.

In the course of an article on Ammonia a week or two ago, we alluded to the possibility that the fixed alkalies as used in development are not so absolutely reliable as to strength as may be at first sight supposed. Not that the alkaline hydrates and carbonates, any more than solution of ammonia, have not a definite value when specially prepared, but, like the last-named, they are so subject to fluctuation that in careless hands they are quite as likely to give rise to uncertainty.

With the object of testing to what extent this may be the case, we have recently performed one or two rough experiments, which, without claiming any degree of scientific accuracy, sufficiently prove how real the danger is, for practically, if the substances mentioned be blindly accepted at their theoretical value, the results may be quite as misleading as in the case of ammonia solution.

The causes of uncertainty vary very materially with the different substances. Thus, carbonate of potash, a sufficiently definite salt when freshly dried or in the anhydrous state, is extremely deliquescent or liable to absorb moisture, and even when apparently quite dry may contain a considerable proportion of water. Carbonate of soda, too, in the anhydrous condition, is a definite substance, though it can only be relied upon as such after recent dehydration. In the form of a hydrate, as usually employed, it is, perhaps, one of the most uncertain salts we have, as it exists in such a variety of degrees of hydration, and is so constantly liable to change, that it is never possible to tell without actual trial what is the real value of any particular sample.

The hydrates of potassium and sodium, frequently used in photography, are equally subject to variation, not only from deliquescence, but also from absorption of carbonic acid from the atmosphere, and unless carefully and freshly prepared can scarcely be relied upon as representing their theoretical values

in cases where great accuracy is required. Even when preserved in the most carefully stoppered bottles, these hydrates slowly deteriorate. A sample of sodium hydrate that we have had some years, although so hermetically sealed that the bottle had to be broken to extract the stopper, was found to have absorbed moisture and carbonic acid to the extent of nearly one-third of its weight. In the case of a sample in constant use, and frequently exposed to the air, the change would be correspondingly more rapid.

Commencing with carbonate of potash, a sample was obtained from a chemist of repute in the ordinary way of business, in order to test fairly the value of the commercial article as usually supplied. Naturally, by going to an operative or manufacturing chemist, and asking for the pure article, we should expect to get something that was not far from the mark, but the majority of the readers of this JOURNAL are dependent for their supplies upon the pharmaceutical chemist; we, therefore, obtained our best specimens from that source. It was a a sample of the "pure" carbonate of potash of the shops, that is to say, pharmaceutically, though not necessarily analytically pure—not the crude kind sold as "salts of tartar."

As obtained it presented the appearance of a perfectly dry powder, without the faintest symptom of dampness or adhesiveness; it was, in fact, a very good sample of the salt as obtained commercially. To see how far it had already suffered from deliquescence, although it did not appear to have so suffered, 1000 grains were weighed out in a porcelain basin, and submitted to the heat of a drying oven for between three and four hours, and then reweighed. The result was, we confess, a surprise to us, although we had, of course, expected some loss of weight: for of the original 1000 grains only 867 grains remained, a loss of 133 grains, or over one-eighth of the total weight. This being the case with a good sample, it is impossible to estimate what amount of uncertainty might be expected from one that had been carelessly preserved.

There could be no question as to the decomposition of the salt by excess of heat, since carbonate of potash may be raised to a red heat without decomposition; in fact, that is really the only method that will ensure its being perfectly anhydrous, so that in all probability the actual water contained in this sample was greater than that shown.

To test the rapidity with which it was capable of reabsorbing moisture, the basin was left freely exposed to the atmosphere in a comparatively dry room, without a fire, for some hours. We had anticipated that the carbonate would have quickly shown signs of deliquescence, but such was not the case, and at the end of nineteen hours only a few minute crystals adhering to the sides of the basin showed any such tendency. At this stage it was again weighed, and found to have increased since drying to 973 grains, or within half a drachm of its original weight. In another hour it had more than regained its original weight, and after that the change proceeded with great rapidity, until the whole became a sloppy mass. In fact, it seems as if the more moisture is present the more rapidly is it absorbed.

The moral of this experiment is, therefore, that even with the best samples of carbonate of potash it is desirable to dry them before use if they are to be reckoned at their theoretical value.

Next we turned our attention to carbonate of soda, which, as we have already said, is a most variable salt as usually met with—we are alluding now to the commercial kind sold as washing soda. This is usually supposed to be a hydrate containing ten atoms of water, but we believe there are in commerce hydrates containing a far lower percentage of water. But the ten-hydrated salt is liable to further variation from the presence of additional water mechanically held in the interstices of the crystals on the one hand, and from loss of water by exposure to the air, or efflorescence, on the other; so that it can be plainly seen that the crude commercial carbonate is quite unworthy of any reliance where accuracy of result is required.

From a quantity of the salt freshly obtained from the drysalters, the largest and cleanest crystals were selected, and these were broken up and weighed at once into quantities of 1000 grains each, five such quantities being simultaneously dried as before, though at a lower heat, to avoid loss from the ebullition of the melted mass. Our reason for operating on several samples was that we might take an average, and so to some extent compensate for accidental variations in the quantity of mechanically contained water in the different crystals; and that our suspicions in this direction were fully justified was proved by the wide variations in the separate results obtained. The mean of the five experiments, however, showed that each 1000 grains of the picked crystals had been reduced in weight to a little over 350 grains, which, taking the crystals as originally representing a ten-hydrated volt, was much below the proper mark.

By treatment in the manner indicated, the carbonate is not reduced to the anhydrous state but to a mono-hydrate, that is it still contains one atom of water, and the reduced weight should therefore have been about 433 grains. The actual result points to the presence of a much larger proportion of water in the fresh crystals than is accounted for by the water of crystallisation.

A similar series of five experiments was then made with the smaller and partly effloresced crystals from the original bulk, although we may remark that the absence of the dry and dusty appearance due to efflorescence showed that there could not have been much loss of water from that cause. The accidental or mechanically contained water would, however, we considered, most probably be present in smaller proportion in the crushed crystals than in the unbroken ones, not only from evaporation from the larger surface exposed, but also because the very act of crushing the larger crystals would expose the imprisoned moisture. As we had partly anticipated, the result of this series of experiments differed very materially from the previous one, for not only was there less variation between the individual weighings, but the mean was considerably higher, being 406 grains as against 353 of dried carbonate. This, however, was still considerably below the theoretical quantity, showing that the sample of soda under examination was utterly untrustworthy as a definite combination.

A sample of pure crystallised carbonate of soda was then submitted to the same course of treatment for the sake of comparison, and this, after drying and reweighing, gave 462 grains of dried product, a quantity considerably in excess of the theoretical. This was undoubtedly due to the drying not having been carried out to the utmost limit possible, and it only suggests the probability that the sample of washing soda tested was actually worse than it appeared.

The lesson to be learnt from these trials is undoubtedly that common washing soda is to be avoided where uniformity of result is expected. Even when submitted to the process of drying, as already described, it forms a but little better basis

on which to found a chemical calculation. In the case of carbonate of potash it is different, as, when thoroughly dried in an ordinary oven, it forms a practically anhydrous salt. The pure crystallised sodium salt, if not exposed too freely to the atmosphere, is, on the other hand, a fairly stable and reliable article, and should be preferred in all cases where obtainable.

With regard to the effect of efflorescence, we were somewhat surprised to find that a quantity of 1000 grains of freshly crushed crystals exposed for twenty-four hours to the atmosphere of an ordinary room without a fire had only lost weight to the extent of between fifty and sixty grains, and the greater proportion of this was undoubtedly due to the evaporation of the mechanically combined water, as in the next twenty-four hours the loss was only about twelve grains. If properly kept then, there seems little need to fear serious inconvenience from an increasing value due to efflorescence.

The Royal Photographic Society's Exhibition.—For this exhibition, which opens on Monday week, we understand that both the number and quality of the pictures which have been submitted to the Hanging Committee are satisfactory, and that there is every prospect of a good exhibition resulting.

Photo-zoetrope.—Mr. Edison is said to be preparing a series of photographic reproductions of the most interesting parts of a popular piece in one of the New York theatres. These are to represent the gestures and movements of the performers, while a phonographic attachment will reproduce the voice. The report says that 75,000 photographs will be required for the purpose. If so, some photographer is busy just now.

Geological Photographs.—The Museum of Practical Geology in Jermyn-street has just been greatly enriched. The fine collection of geological photographs that were shown at the recent meeting of the British Association at Oxford have been deposited by the Council in the Jermyn-street Museum. The photographs exceed a thousand in number. Geologists have often appealed to amateur photographers to devote some little attention to interesting geological subjects when they come across them, and that they frequently do in searching for the picturesque.

American Observatories.—The United States can boast of something like a hundred observatories, public and private, and the largest telescopes in the world. In most of them photography is a special feature, as we all know. Astronomical science has grown rapidly in America, for we are told that the oldest observatory is not more than sixty years old. Yet, probably, during the past few years more important work has been accomplished, and discoveries made there than in any other country. Much of that may, however, be attributed to the possession of such exceptionally large instruments and their excellence. The Lick Observatory, where such important photographic work is done, eclipsed the Nice thirty-inch object-glass with its thirty-six-inch one. Now the Lick instrument is to be outdone by the Yerkes observatory at Chicago, with one of forty inches in diameter. American enthusiasm in astronomy certainly runs high.

Collodio-chloride.—The stability of prints made by the collodio-chloride process has, during the past two or three weeks, formed the topic of conversation at some of the London Societies. At a demonstration of toning after fixing at one of them, it was found that the prints on collodio-chloride paper resisted the action of a reducing agent better than those on any other paper. At a subsequent meeting of the same Society the subject was again brought up, and members referred to prints in their possession, that had been done for various periods up to a quarter of a century, that show no evidence of fading. At another Society this process was classed as the most stable of all silver methods. During one of the discussions the name of Mr. Bruce, of Duns, was mentioned as having produced the prints the stability of which was referred to. If we mistake not, Mr. Bruce has worked the collodio-chloride process almost exclusively for more than twenty-five years.

Reproducing Postage Stamps.—The question has often been replied to in the "Answers" column as to whether it is illegal to photograph a bank-note, provided it is of a widely different size from the original—say the *carte-de-visite* size, for example. The law is very stringent on this matter, and forbids a copy being made of any size whatever, and most persons are now aware of the fact. It is not, however, known to every one that it is illegal to reproduce an obsolete postage stamp. For some little time past, the *Million* has been publishing a series of articles on "Our Stamp Album," and one of them contained a reproduction of the old red penny stamp. Last week the Inland Revenue authorities made a raid on the office of the paper, and seized all the copies in the place containing this illustration, as well as the stereo block itself, and conveyed them all to Somerset House. Whatever may, or may not, be done with British stamps, we know that thousands of copies of foreign stamps are sold, and we also know that the majority of them are done by the collotype process.

Our Patent Law.—Comments have often been made as to how "patents" can be obtained in this country for old and well-known things. The specification of a patent was published a few days ago that we think will cause most of our readers a smile. It is for "An improved material or compound adapted for use as a varnish, as a substitute for indiarubber, gutta percha, and like substances, and for other purposes, and the process for its production." The new substance is soluble pyroxyline dissolved in methylated spirit that has been strengthened by distillation from quicklime or carbonate of potash, and then mixed with methylated ether. A certain proportion of castor oil, and, sometimes, a little copal are added. Or, as a solvent, methylated spirit distilled with a hydro-carbon such as benzol may be used. There are seven claims in the specification. The first we give verbatim: "The herein-described process for the preparation of a solvent, consisting in the treatment of methylated spirit with quicklime, potassium carbonate, or other suitable agent to remove the water therein, distillation of the spirit so treated, and, finally, the addition thereto of methylated ether, substantially as and for the purpose described." How is that for originality? By the way, we were under the impression that the Excise regulations prohibited the redrawing of methylated spirit, either for the purpose of purifying or strengthening of it. Our Patent Office goes on the principle of "take the money and ask no questions."

Old Negatives and Modern Papers.—During the controversy on the different methods of toning and fixing prints, reference has more than once been made to the negatives that used to be made when the old combined toning and fixing bath was employed, and the influence the negative had on the stability of the prints. The vigour of the collodion negatives of thirty and more years ago would certainly surprise the majority of modern workers. So great is it that many have been led to surmise that collodion negatives must get denser with age. The deepest shadows of these negatives were represented by clear glass—not what is now understood as clear glass in a negative, but absolutely free from any kind of veil when laid on white paper—while the highest lights were perfectly opaque, even in a strong light. The negatives of the late Adam Solomon were all of this character, and to that must be attributed the tones he obtained in his pictures. Such negatives, however, would be perfectly useless with the modern emulsion papers, and even with some of the ready-sensitised albumen papers of to-day. With gelatino-chloride paper these negatives would yield nothing but prints of the "soot and whitewash" type. Indeed, we know, in some establishments, where this process has been adopted for current

negatives, albumen paper still has to be used for reprints from collodion negatives. At no period of photography has the tendency been so great to produce thin and delicate negatives as now, and, of course, the paper is prepared to suit them. As the new paper is useless for the strong negatives of the past, so the paper of old would be of no good with negatives of the present-day character.

PHOTO-MECHANICAL NOTES.

DESPITE the almost entire displacement of bitumen as a sensitive ground for photo-etching work, the commercial asphaltum still plays an important part in the business; indeed, it could hardly be dispensed with. In making the etching inks for the rolling-up process, it is a most essential ingredient, both in the "starting" and the "finishing" inks, the hard and soft etching inks respectively. For this purpose, bitumen, or asphaltum, as it is indifferently called, has qualities which resin alone cannot give. It does not melt nor spread so readily as resin, and it has the advantage of dark colour, so that its effects can be readily seen. Resin in a "starting" ink sometimes has a knack of running out and spreading beyond the limits of the lines, and, being light in colour, such action cannot be readily seen.

Finely powdered bitumen has always been held to be one of the best possible powders for dusting on half-tone plates; here, again, the fact that its effect can readily be seen, and that it does not easily spread, being regarded as its advantages. Bitumen, too, can be reduced to a much finer powder than resin. The latter is apt to cake together again if powdered too fine, though it is possible to correct this to some extent by heating the natural resin until the volatile resinous oils are driven off.

For line zinco work, bitumen is not so generally used, chiefly, no doubt, on the score of expense, for powdered resin, at fourpence per pound, is accounted quite good enough for this purpose, and a good powdered bitumen can hardly be produced under 2*s.* 6*d.* per pound.

In the photogravure process, powdered bitumen is well acknowledged to give the best possible grain on the copper plate, and the finer the better is the pretty general requirement for photogravure bitumen.

Again, in photo-litho work it has been found that a much sharper and stronger transfer can be obtained if the transfer print, after being inked, and when quite dry, is dusted over with waxed asphaltum, which is obtained by melting one part of beeswax with ten parts of asphaltum, and, when cold, reducing to a fine powder.

In many processes, more or less intimately connected with process work, as we know it, bitumen plays an important part. For instance, in the various methods of intaglio etching with the needle-point, it is the principal constituent in the etching ground, whether liquid or solid; it is also used for some of the stopping-out varnishes, and every one knows it is the basis of Brunswick black, with which the backs and margins of the plates are usually coated. In the resist for fluoric acid etching on glass, it plays the principal part.

Where zinc or copper plates have to be shipped on a long voyage it is an almost invariable plan to coat them with a thin varnish of asphaltum, which effectually protects the surface from corrosion by dampness. It can readily be cleaned off with any of its solvents, and the clear polish of the plate restored with washed whiting.

As a waterproof coating for wooden baths, either alone or in conjunction with stearine, bitumen is of great value, and appears to have no effect whatever on a silver bath solution.

It may be mentioned that there are two distinct varieties of bitumen in its commercial form. The commonest is of dull appearance, and of pungent, pitchy odour. It crumbles rather than breaks; whilst the other variety—the Syrian asphaltum—can always be identified by its bright conchoidal fracture, sweeter smell, and less sticky feeling. The common asphaltum is most used for inks, powders, and varnishes, whilst the Syrian has been the quality always selected for making the sensitive bitumen.

Whilst on the subject of bitumen powders, I may mention the now well-known "pitch powder" of Mr. Henri Calmels, which is now being extensively used. Mr. Calmels hit upon the ingenious idea of combining bitumen, resin, and English pitch—three of the best acid-resisting ingredients known. These, when melted together and pulverised, give a very fine powder, which, when dusted on, and the plate slightly heated, forms a homogeneous film on the lines or dots of the picture.

Almost as important as bitumen is resin. It is also a leading ingredient in the etching inks, and is also invaluable as a powder for dusting purposes, especially, as we have already said, for line work. The common brown resin, which is the residue of the distillation of American turpentine, is good enough for any of the foregoing purposes; but for the finest work, and as a photogravure ground, the white resin, the residue of Bordeaux turpentine, gives the best results. Of course there are numerous other resins which might be drafted into the service of the process worker, but in most cases price is a consideration which militates against their use. For instance, copal resin has been used as a photogravure ground, and it certainly will give a very hard resist and open grain. Lac, too, which also comes under the generic term of "resin," has also been reduced to a fine powder, and used for photogravure, being especially popular with French workers. It gives an exceedingly light powder, which does not cake together.

Burgundy pitch, so called, is another resin, but is useful only in ink-making. It is useless trying to powder it, as it speedily cakes together.

Dragon's blood is the most important of the resin group, next to common resin itself. This substance, in fact, runs even bitumen very close as a powder for half-tone, and in America it is extensively used for line work. Care should be taken to get a really good quality, and this is easily distinguished by its brilliant red colour. If of a dull terra cotta, it is of practically no use, being of an inferior quality. The best is dear, a really good sample being hardly obtainable under 3*s.* 6*d.* per pound.

It is not so long ago that the dragon's-blood process was almost unknown in this country, whilst it was being quite universally used in America. In practice it is usual, after printing in bichromated albumen, and inking the plate well with a stiff photo-transfer ink, to dust the developed print with fine resin. The plate is then warmed, and before it has quite cooled down, the dragon's blood is vigorously brushed into the lines or dots of the picture with a soft brush. After the surplus is cleaned off, the plate is heated until the red hue of the dragon's blood gives place to almost a black. When cool, the first etching may be proceeded with, and carried to a considerable depth. In the case of line work, it is the rule, after the first etch, to dust the plate in such a way that the powder lies against the sides of the lines like driven snow. For this purpose it is necessary to have a very soft brush, with no spring in it, otherwise the powder will be lifted out as the brush passes over. The plate is powdered four times, the brush being trailed across the plate only one way, but, of course, in opposite directions each time. The plate is heated to fix the powder between each dusting. In this way, an acid-resisting protection is built up against the shoulders of the lines, and it is possible to carry through the etching to sufficient depth without resorting to any of the rolling-up methods of reinforcing the lines. In half-tone work, only surface powdering is, of course, admissible.

It has been suggested that metallic powders might be dusted on to an inked print on the zinc, selecting the powder of some metal which is known to be insoluble in the acid mordant which is being used. For instance, graphite has been proposed, and also gold bronze, both being unattacked by nitric acid. But this process, whilst very pretty in theory, appears to fail because either the powder is not sufficiently fine to form a homogeneous film, or it is impure by being ground up from alloyed metal. I dare say the idea was obtained from lithographic work, it being a common practice, when one wanted to "etch" a stone, for cleaning up the work, to dust the ink lines over with gold bronze, so as to make them withstand the action of the acid.

Dusting powders are not now of so much account for half-tone work, for the various enamel processes are fast superseding all methods of rolling up and dusting. WILLIAM GAMBLE.

CONTINENTAL NOTES AND NEWS.

Platinun Toning of Matt Collodion Paper.—Herr Valenta recommends the following method of platinum toning. After washing, the prints are immersed in a solution made as follows:—

A.

Water	500 grammes.
Soda phosphate	50 „

B.

Water	500 grammes.
Potassium oxalate	100 „

The two solutions are mixed, and to 100 cc. of the mixture 1 c.c. of the double chloride of sodium and platinum (1:10) is added. The prints take a black tone in this bath, which is changed to brown in

the hypo solution (1 : 10). For black tones the following fixing bath is recommended :—

Water	1000 c.c.
Hypo	200 grammes.
Lead nitrate	10 „

To 100 c.c. of this solution, 100 c.c. of water and 5 c.c. of gold chloride (1 : 100) are added.

An Insoluble Developer.—Herr E. Liesegang quotes an experiment in which a negative on a gelatino-bromide plate was "developed" with an insoluble substance. A normally exposed plate was immersed in a solution of carbonate of soda, and then, having been well drained, in a second solution of ferrous sulphate. The ferrous carbonate formed by double decomposition is said to have developed the negative even more vigorously than iron oxalate would do. The substitution of soda sulphate for the carbonate is said to have given nearly as good results. The precipitated carbonate of iron left in the film is removable by dilute sulphuric acid.

Protecting Unfixed Negatives from Fog.—This may, it is stated, be effected by immersing the plate for five minutes in a solution consisting of—

Alcohol	150 grammes.
Cadmium bromide	10 „

This makes the unaltered salt insensitive to light—even direct sunlight. The unfixed plate will, it is also said, keep well for months. For those who want such a formula, this is just about the kind of formula they want.

A Commission of Inquiry into the Permanence of Gelatino-chloride Prints.—A Commission is projected whose object shall be to inquire into the alleged impermanence of gelatino-chloride prints and the causes thereof. M. G. Mareschal, director of the *Photographic Gazette*, 12, Rue Demours, Paris, is taking the initiative in the matter, and he invites particulars from photographers in France and elsewhere. He rightly says that this question of permanence is one in which all photographers are interested, and he asks his readers to reply to the following questions, engaging that the replies shall be submitted to a Commission of photographic authorities who will report their conclusions :—1. State of preservation of the print; 2. Method of toning and fixing (separate or combined, with formulæ); 3. Time and method of washing; 4. Preparation of the paper; 5. Method of mounting and kind of mountant employed.

A Revolving Studio.—*La Nature* contains an illustration of a revolving studio which is employed by M. Dujardin, of Paris. The studio is built on a platform which revolves on wheels in a circular groove laid on the ground. Such a studio would, no doubt, be appreciated by many for taking advantage of the best or most suitable light proceeding from a particular part of the sky at any time of the day, especially when the sun was not shining.

The Milan International Photographic Exhibition.—Dr. Gioppi, of Milan, gives, in *Le Moniteur*, an interesting account of this Exhibition, which appears to have been a great success. The exhibitors were chiefly Continental workers and manufacturers, very few from this country appearing to have sent. Professor Roster's photo-micrographs and tele-photographic pictures come in for much admiration. The former had a range of from 30 to 2900 diameters of enlargement, the tele-photographs were enlarged fifty-two diameters.

A Photographic Apparatus Museum.—M. Hermagis has proposed to the Chambre Syndicate des Fabricants et Négotiants d'Appareils et de Produits the formation of a photographic museum of apparatus, materials, and accessories, not only modern but ancient, by voluntary gifts. He gives it as his opinion that such a museum would be of great interest not only to photographers and amateurs, but also to manufacturers, mechanicians, &c. The idea of M. Hermagis is a good one, and is certainly worth imitating on this side of the Channel. Who will take the lead? Stay, though! is there not a Photographic Museum attached to the "Royal" Photographic Society? Of course there is; we had almost forgotten its existence. May it increase as much as it needs do, which is a great deal. For, at present, like the young lady's baby in the story, it is only "a little one."

Yellow Screen-holders.—To avoid the necessity of having a series of separate screens for orthochromatic work, Messrs. Duplouich & Henry, of Paris, have adopted the following devices. In the one case the lens is fitted with a supplementary revolving diaphragm, the apertures of which are fitted with screens of different diameters. Thus, the screen system is, as it were, contained in the lens. In the alternative case a slot is cut in the mount, and this admits a rectangular stop, having the screens fitted in a row.

ON THE DEVELOPMENT OF UNKNOWN EXPOSURES.

III.

But very seldom, indeed, does it happen that all plates will come along in nice gradation when passing through the normal developing bath. In former days, when plates of a much less exalted degree of sensitiveness to those of the present day were chiefly used, it was then most common to look upon under-exposure as the more general cause of failure. Now, however, there is but little doubt that the reverse is the case, and that over-exposure is much more frequently met with than under-exposure. An under-exposed plate will always allow of plenty of time to an operator to ring the changes in development, but the utmost promptness must be exercised with those plates of the rapid type that are even but *slightly* over-exposed. The behaviour, therefore, of every fresh plate inserted in the normal developer must be scanned with the closest scrutiny, and, when the well-known signs of over-exposure first put in an appearance, there must not be the slightest hesitation in immediately removing it from the normal bath into the dish of clean cold water ready at hand. Here it can lie submerged until the developing solution which has permeated the film, and which is still more or less active on its surface, is so weakened as to arrest development. After a few moments this plate should be taken specially in hand, and some particular judgment made as to the class of subject and probable amount of over-exposure. In most cases the removal, while still wet with water, into the bath specially prepared to meet cases of over-exposure will be found sufficient to meet the requirements of plates not hopelessly overdone. In very bad cases, at times it is extremely difficult to decide whether or not the development should be further continued or not, or whether the plate should be then and there fixed and washed, with the view of afterwards being carefully intensified. An operator is often best guided by the class of subject that presents itself under such circumstances. In some instances, also, a very considerable amount of improvement may be conveyed to an over-exposed plate, by immediately removing it from the developer and flooding the surface of the wet film with a plain pyro solution of, say, three to five grains of pyro per ounce of sulphite and water (this, of course, provided pyro is the chemical being used). In any case the water bath should never be omitted; it is a most valuable adjunct, and far better than the water tap, for the entire surface of the plate is plunged at once under the water, and the whole surface is acted upon at one and the same moment, and to the same extent, all over; and even after the plate has been conveyed into the water bath an operator's hand is free to attend to the other plates still in the normal bath, for the over-exposed plate can be allowed to remain in the water until any one can find time to conveniently devote special attention to it.

There is one class of subjects that frequently gives an operator no little amount of anxiety, and which is very apt to be mistaken for cases of over-exposure. I refer to that class of pictures termed open landscapes, such as a plain field, without any well-defined foreground or deep shadows. Such cases require an almost special method of development, and the slower these are worked up the better will the utmost amount of contrasts be obtained. These kinds of subjects are invariably over-exposed, and very difficult to deal with.

I have refrained from expressing any decided opinion as to the best developing formula to employ in cases of over-exposure, because

so many workers prefer at all times to develop after their own special manner that it is best not to recommend any particular formula; for, after all, there are so many ways of treating an over-exposed plate successfully that an operator is best to stick to what he is most familiar with. Some workers make a rule of fully exposing, and then, after developing only a thin, weak image full of detail, proceed to gain density by means of a special application of a developer containing a more or less quantity of one of the citrates; others, again, pin their faith to a plain pyro and bromide solution being flooded over the surface of the developed image; others, again, rely on intensification after the plate is fixed and well washed.

In any case the utmost promptness must be displayed in arresting the development when the first symptoms of decided over-exposure are apparent. It is at this stage that many an over-exposed plate is saved and turned into a fairly good printing negative.

The treatment of under-exposed plates, or, as some chose to term them, spring-shutter exposures in poor light, is totally different, and often require long and tedious attention in development. When such fail to show signs of developing after being in the normal developer for a longer time than usual, or merely display partial spots of high lights, such as the sky, or white buildings, or draperies, &c., a safe rule to follow is to immediately remove them from the normal developer into the water bath for a few minutes, and then into the developer prepared specially for such cases, and which ought to be on the left hand of the operator. This bath should be weak in pyro and bromide, or whatever other developing agent is employed, so as not to increase the high lights before the utmost amount of detail is brought out by a prolonged development in a bath weak in pyro and bromide and strong with potash and soda, provided the dish is well covered up, so as to screen the plate from any light from the developing lamp. It may take hours before the full amount of possible detail is brought out of a plate. The utmost patience and perseverance will be required; an amount, indeed, which many an operator has not the courage to bestow upon strange plates handed to him, the nature of which, so far as the subject and conditions of exposures, &c., are concerned, are entirely unknown to him. The great point, however, is to refrain from forcing along or developing too rapidly; instead of minutes, hours will frequently be required to gain detail, and then, once the utmost amount of detail that is possible having been obtained, density may be acquired by a special treatment afterwards.

It is really marvellous what can be done with some of the modern fast plates and rapid-shutter exposures with a dogged perseverance, and a weak developer to start with. Of course, there are cases of under-exposure that never will yield printable negatives, but they are not so common now as they were ten years ago. Plates are made of such an extraordinary degree of sensitiveness that it is almost impossible to under-expose them, provided the light is any way good.

In nearly all cases failures are, more or less, attributable to exposing in bad light than to anything else. Since the almost universal introduction of hand cameras, and the fastest of plates to work with them, an idea has got abroad that any one has merely to point the camera, touch the spring, hand the plate to a professional photographer for development, and all will be right. There is never any consideration given to the necessity of spring-shutter exposures requiring the very best light to ensure success, and the utmost steadiness when holding the camera.

It is with these hand-camera exposures that an operator is so apt to lose patience, and throw up in disgust the development of all unknown exposures, requiring, as they do, such keen perception, quickness of judgment, and dogged perseverance, to ensure even a small meed of success, without, in exchange, anything like a fair remuneration for so much trouble expended, and certainly more often grumbles instead of thanks.

T. N. Armstrong.

PROFESSIONAL PHOTOGRAPHERS AND DEPRESSION OF BUSINESS.

II.

What I have to say further about the causes of depression regards more nearly the photographers themselves. I will begin with an illustration.

When I was still quite young there had been some great and almost sudden movements, which had increased enormously the occupation for a set of men whose ranks I should afterwards have been glad myself to join, had circumstances permitted. The first impulse had been given by the invention of and improvements in the steam engine. This called into existence a large number of mechanical engineers. This movement was soon followed by the spread of railways all over the country, with all the surveying, valuing, and civil engineering involved in it. There was also a series of Commons' Inclosure Acts, requiring the survey and valuation of all properties having a claim, besides that of the commons themselves, with the laying out of the same; and there had been the Tithe Commutation Act, requiring the surveying, mapping, and valuing of all the parishes in the kingdom. These various operations had, within a comparatively brief space, called into the field a very large number of engineers, surveyors, and valuers. The business was profitable, and the entrance-door not too difficult. The enormous amount of work to be done had brought a corresponding increase in the number of workers. As the work fell back again to more normal conditions, what was to become of all these? It is evident that only those would continue to find employment who were regarded as the *fittest*, or who possessed corresponding advantages in some other way. Yet to many of these, well-to-do fathers with promising sons continued to offer large premiums, that such sons at the end of the term for which they were articled might also join the ranks. Afterwards, in more cases than one, where fathers had been giving their sons a special education, and asked my advice as they were turning their minds to such an object, I was obliged to point out to them that there were no doubt many who would readily accept their premiums; but unless there were some special circumstances, or some special interest, ensuring employment for their sons afterwards, they would be wise to pause before entering further on that path.

Now, although the parallel in regard to photographers may not entirely hold, yet I think it will run a long way. While, from the causes pointed out in the former part of this article, incomes and surpluses were increasing, the increased demand for such objects as photographs must have tended greatly to increase the number of workers. Here the door was even more widely open, and, in general, neither the same education nor the same expensive articles were required. Looking at the general state of things when I first began (some twenty years, or rather more, ago) to interest myself practically in photography, and so long as wet collodion had to be chiefly relied upon, I should judge there were difficulties in regard to manipulation and other things, which have proved a barrier to many. At least, there seemed to me, at that time, to be numerous indications that many, attempting to enter, had been so little satisfied with what they found themselves able to accomplish, that they had elected to retire. More recently I have become aware that during the time which had elapsed since my own attention had ceased to be given to the subject, there had taken place so much improvement and so much simplification, as to remove the barriers for nearly all but the most contracted in mind or awkward in manipulation, and doubtless the number of workers has increased in proportion.

Whether the absolute amount of employment to be given to photographers be actually less than during those years of prosperity referred to in the former part, or whether, on the other hand, the sum total has increased, it is not difficult to conceive that the workers may have increased out of all proportion to the increase of the work, and that what might have provided a very comfortable existence for one, may render existence much more precarious when divided between two, three, or four. I should think it must be competition of this kind that is actually the most formidable difficulty for the professional photographer, although, as I have pointed out and as we all know, it is not in this profession alone that this difficult question has to be dealt with. And what is the solution: Shall we endeavour to get laws made to turn out the superfluous members? All seem to have the same right to enter, and also to remain, if they can. Perhaps the only law we can invoke to regulate the question is one that already, for some ages past, has been in existence. To this law the clearest and most concise expression has perhaps been given by a very thoughtful man called Darwin: *The struggle for existence and the survival of the fittest.* I think it must apply not less aptly and inexorably to the members of any open profession than to the different species of plants and animals in reference to which it was enunciated, although, in individual cases, what are called accidental circumstances may seem sometimes to interfere with it. How many in the profession clearly recognise this law and endeavour to turn if to their own profit, it would not be easy to say; but it is evident there must be very many, and it is probably these who have least right to complain of the depression. For the rest, the only remedy which I can perceive actually lying in their own hands is that which is to be found in this same law: *The survival of the fittest.* It is that which I see, in various forms, constantly insisted on by those kind hearted gentlemen, whose sympathies naturally tend to their own fraternity, be they amateur or professional; and as the former, deriving their existence from other sources, may be left to take care of themselves, it is, of course, chiefly for the latter that the good advice is intended.

I have myself been searching in my own mind, since I have seen the question so sharply raised in the JOURNAL, for a remedy, and, as I said, the one indicated above is the only practical one I have been able to think of.

I do not really know, but I suppose that the entrance to the profession of the larger number of those who afterwards see most reason to complain is through being apprenticed or articled, and through serving as assistants to those already practising. If we consider the status, or the different grades of these latter, from the highest to the lowest, I suppose the ideal of the pupil or assistant, and the routine he is likely himself to adopt, depends principally on that with which he has already been associated. It seems reasonable to presume, however, that no very small number enter by such a door as that which admitted "John Chinaman" in the recent article (August 17) on "Cameras and Chinamen," and that the standard aimed at, and the routine adopted, is fixed accordingly. What I fear most, from my knowledge of what happens in other walks of life, is that very many never aim at rising above the standard, or the routine, to which they have thus been introduced, although it is evident that for these new comers the contest must in many cases be more keen than for those from whom they have adopted them.

My advice, then, to all—to those who have already entered the profession, and to those who are preparing to do so—is to endeavour by all means to place themselves among the *fittest*, to set before themselves a higher standard than any to which they have already attained, and to set their minds to reflect and contrive continually how they may reach it.

In starting to practise in the profession on their own account there are, of course, a number of questions more directly of a business order requiring a cool judgment and a business mind—not too much haste at first, but rather patient investigation: the locality to be chosen, the class of people likely to furnish the *clientèle* most desired, the adaptability of the business premises, whether any little means one may possess are to be spent partly in buying a business already formed (if such a thing can be done), or in building up a business oneself. In regard to the former plan, which must often appear very tempting, judging by the advertisements which appear, I would make one observation. I will suppose that such a business has been, in the hands of the person wishing to dispose of it, all that it is set forth to be. The fact of its having been a prosperous business would lead us to suppose that the individuality of the owner has had a great deal to do with building it up. That is an item which he will take away with himself and which he can by no means sell to another. It does not at all follow that the individuality of the successor will prove equally acceptable to those who have hitherto been the chief supporters of the business. However, the converse of this statement will also hold. If the formation of the business has been dependent on circumstances largely independent of such individuality, that of the successor may, on the other hand, be such as greatly to aid its increase and extension, especially if his work is equal or superior to that of the predecessor, and these are points he should by all means strive after. I have dwelt for a moment on the circumstances of the first selection, because I conceive it to be a matter by no means unimportant. Upon this depends very much whether the struggle is to be carried on under conditions which will continually bring new satisfaction and promote the buoyancy and the energy that are so necessary in such a race; or whether one's work is to be carried on amid discouragement, demanding greater physical exertion and, at the same time, calculated to lame the mental and moral energy so necessary for all who set themselves to aim at higher things.

And now I must pause again. I had not supposed that the thoughts which were occupying my mind would take so many words to express them. In my first spare time I shall hope to conclude, in comparatively few words, what I was chiefly wishing to urge on those who have not yet sufficiently considered the need of or the means they may use in placing themselves in the ranks of the fittest.

W. WASHAM.

ELLIOTT'S CARBON TISSUE.

ON its merits, no printing method deserves to be so widely availed of as the carbon process. The results it produces comply with the very highest ideals of technical and artistic beauty; the process is easy to work, and when once mastered presents none of the occasional difficulties that are the invariable associates of other processes, and very few indeed of its own. Then it is comparatively inexpensive; and above all, a carbon print is not menaced by the common bugbear of impermanence. During the last few years we have watched with pleasure a steady growth in favour of carbon work—amounting, indeed, to a virtual revival, and we are persuaded that among both professionals and amateurs it is immediately destined to be still further popular. As we have so often pointed out in these columns, it is easily adapted, for besides paper-positive printing, transparency and lantern-slide making, full instructions for which will be found in our back volumes.

Not only by the remarkably effective work with which visitors to numerous photographic exhibitions must be familiar, as well as by the large number of charming prints, direct and enlarged, which Messrs. Elliott & Son, of Barnet, produce for photographers and the trade, but also in other ways has this firm taken a great part in popularising carbon printing. In attempting to remove the erroneous, but curiously persistent, idea that carbon printing is difficult and needs expensive apparatus, Messrs. Elliott have been specially active, by demonstrating its simplicity before photographic societies and others—endeavours which deserve success in more ways than one. It is astonishing to reflect what splendid opportunities modern commercial firms afford the photographic neophyte of the day for becoming practically acquainted with the ins-and-outs of the various processes of photography.

Needless to say that, in addition to being themselves extensive carbon printers and enlargers, Messrs. Elliott & Son supply the tissue, sensitised or unsensitised, in bands or cut pieces of various colours, prepared transfer papers, temporary or final supports—in fact, all the material for carbon printing. Recently we ourselves had the oppportunity of trying samples of the (sensitised) brown, black, and red chalk tissues sent out by the firm, and were much pleased, not only with the careful way in which the tissue had been prepared, but also with its excellence and certainty of working. Perfect judgment appears to have been exercised in the selection of the pigments, which in the finished prints give tones of great artistic taste. The instructions given by Messrs. Elliott & Son for working their tissue are singularly clear and terse: for the general benefit we endorse their recommendation that, in the double transfer process, ground opal forms a good rigid temporary support, giving to the finished print a beautiful matt surface.

A carbon enlargement by Messrs. Elliott & Son is an artistic and technical triumph; and carbon printing, under the clear and explicit instructions which they issue with their tissue, &c., becomes as easy as A B C.

NEW RESEARCHES ON THE INFRA-RED REGION OF THE SOLAR SPECTRUM.

[Comptes Rendus.]

IN September, 1882, I submitted to the Academy a communication entitled "Observations on the Solar Spectrum," accompanied by a figure of the curve of energy of the infra-red spectrum obtained by means of a glass prism. On referring to this curve we see that below the wave-length 1·2 μ we have obtained only twelve inflections, great and small, including the great band, the wave-length of which is about 1·8 μ, the band which I have since designated as Ω, the existence of which has been established with precision by the observations made at Mount Whitney. It will be remembered that the existence of heat has also been established at a distance of nearly 3 μ, the limit at which the prism ceased to transmit the radiation.

Photography has not succeeded in representing a much larger part of the infra-red than the eye has been able to perceive, considering that the rays whose wave-length exceeds 0·8 μ can be distinguished with the naked eye, and I do not know that photographs have been published giving radiations the length of which is much above 1 μ.

Certain interesting results have been obtained even below this point (1 μ) by procedures of phosphorescence. But, if I am not mistaken, the curve given in my communication to the Academy comprised our principal actual knowledge concerning the extreme region, around and beyond Ω in the spectrum of a glass prism. These inflections were obtained and determined by means of the bolometer, and by a procedure so slow as to leave us no prospect of carrying our measurements much further.

In 1890 the Congress at Washington authorised certain astrophysical researches, the execution of which was intrusted to the Smithsonian Institute. Thanks to the experiments conducted in the last years, we have at last succeeded in substituting for the slow and personal method just referred to, another, which—though founded on the use of the bolometer—is almost automatic, and which, whilst much superior to the old method in precision, is at the same time incomparably more rapid and delicate.

The bolometer and its appendages have been improved in such a manner that they are not confined to indicating a change of temperature;

they also give its value where its variations are below one millionth of a degree C., since they are shown in the metallic ribbon of the bolometer, which has $\frac{1}{20}$ mm. in diameter, and $\frac{1}{5000}$ mm. in thickness.

Clockwork of great precision moves the spectrum in such a manner that each of the rays, visible or invisible, passes successively over the ribbon, which meantime, on account of its slight mass, changes its thermic equilibrium in so short a time that it may be regarded as insensible. Since what is dark to the eye is cold to the bolometer, the presence of an invisible absorption ray is indicated by an almost instantaneous deflection of the galvanometer.

This deflection was formerly shown to the eye upon a scale. At present there is substituted for the scale a sensitive photographic plate, moved in a vertical direction by the same perfect wheelwork which passes the spectrum over the bolometer. It follows that the curve of energy is registered in a perfectly automatic manner by means of photography, with the aid of the bolometer, in regions hitherto quite inaccessible to photography alone.

A perfect synchronism being thus secured in the movement of the photographic plate and of the distant circle which carries the prism, we see without difficulty that the curve traced automatically can show us at first sight not merely the magnitude of the variations of the temperature of the spectrum, but also the exact part of the spectrum where they are produced.

Not many dozens, but thousands, of deflections, corresponding to the Frauenhofer rays of the visible spectrum, may thus be registered; and we can now obtain with precision, in an hour, results which could not be obtained with the micrometer, even at the cost of many years of arduous work, so well that we may take for comparison in one and the same day several representations of the entire spectrum. These, as well as others obtained on different days, are submitted to a strict comparison by a method which checks the existence of each inflection, at the same point of all the curves thus traced independently of each other, with a probable error of position which corresponds to less than a second of an arc. On thus examining the lower invisible spectrum, we discover that it is the seat of absorption, at least as complex as those produced in the visible spectrum, and the new method already distinguishes more than 2000 invisible rays. The maps of this region, hitherto unknown, will soon be published.

To prove to what extent the new method possesses the power of separation, we may apply it not only to the invisible spectrum, where for the present our word must be taken for the results obtained, but to the visible spectrum, where it may be applied to the study of a known region, *e.g.*, that of the ray D. Our apparatus, purely thermometric, not merely resolves this ray into its two elements, but reveals the ray of nickel found in the middle. This is the well-known test of visual spectroscopes of considerable power.

The graphic trace, on the contrary, is automatic, and of a double effect. We have, firstly, the curve of energy obtained automatically; the abrupt inflections are due to the extreme sensitiveness of the apparatus. It registers photographically the variation of temperature produced by each of the rays, which separately are invisible unless magnified.

A method, the details of which will be given in a future communication, renders it possible to convert this curve of energy into a linear spectrum. This linear spectrum, which the author gives in his memoir, is obtained by an automatic procedure applicable to all parts of the spectrum. Although the known angular distance between the rays D, in the spectrum given by rock-salt, scarcely exceeds ten seconds of the arc, the ray of nickel appears so separate from its neighbours that the possibility of a much further resolution appears evident. The instrument can separate rays whose interval does not exceed two seconds. Now, since this purely thermometric process is applicable in the total extent of the invisible heat spectrum given by a prism of rock-salt on a surface of 2° (say 7200″), we may say that this procedure has a power of resolution capable of revealing to us thousands of rays if they exist.

Taking the instance of these D rays, my object has been to inspire confidence in the assertion that the entire inferior infra-red spectrum, from 1·2 μ to 6 μ, may now be reproduced automatically by a process giving hundreds of rays for each ray known hitherto, and that the relative position of each will be given with a precision hitherto unknown for measurements of this kind.

Let us add that not merely the greater part of the solar energy is found in this little-known region, but the absorptions seem to be due to our atmosphere rather than to that of the sun. Hence it is not improbable that their study may supply a precious means for foreseeing the variations which influence meteorological perturbations.—*Chemical News.*

Prof. Langley.

SIR DAVID SALOMONS AT HOME.

The Croydon Camera Club's excursion, held on the 8th inst., in charge of the President, Mr. Hector Maclean, F.G.S., to Broomhill, by kind invitation of Sir David Salomons assuredly deserves to be recorded in the Club's transactions with vermilion ink, for almost everything conspired to bring about a successful half-holiday of pleasure and profit mingled in very effective proportion. To recount the often-told attractions and marvels of Broomhill is needless—the task would anyhow be impossible within the short space available—but mention may well be made of the equine palace, which, only just completed, is a veritable model, which all who rejoice in horses and stabling may aim at rivalling, but which none are likely to equal. Sir David, with a graciousness which is all his own, with much care and lucidity explained and, where possible, demonstrated the many improvements and inventions with which this—in the best sense of the word—magnificent building teems.

Photography was actively engaged in by the more irrepressible of the camerists, which included a party of members of the Tunbridge Wells Amateur Photographic Association, amongst whom were numbered the world's *doyen* in photographic picture-making, Mr. H. P. Robinson, together with one of the latest of the new and successful exhibitors, viz., Mr. E. R. Ashton. After due sacrifice had been made to the goddess who delights in dry plates, the famous workrooms and studio were inspected: here were seen astounding contrivances for all manner of research, craft, and recording purposes. Electricity whirled round wheels which drove a score of various machines—some which whistled out shrill flute-like sounds, so fast did they revolve; airpumps that produced a practical vacuum in as many seconds as formerly took minutes; drills, lathes, electric hammers, and many another ingenious and curious machine, were set going and briefly described.

Then Sir David's newly devised, complicated, but effective microscopic attachment for the projection of images of microscopic slides on to the screen attracted great interest; while some who were lantern operators gazed with veritable awe upon a unique "three-decker," which almost seemed over-perfect in its amazingly numerous attachments and adjusting parts. Pictures and statuary, of which there is a most attractive collection, an electric piano, gardens of shadow and parterres of colour, a tall astronomical observatory tower, and the engine-rooms all clamoured for admiration. Prior to returning, Sir David entertained the party with tea, coffee, and other light refreshment. At the instance of Mr. Hector Maclean, speaking on behalf of Croydon Camera Club, seconded by Mr. E. Catchpole, on behalf of the Tunbridge Wells Amateur Photographic Association, hearty thanks were tendered to Sir David for his great kindness and hospitality. The latter, in reply, stated that he was very pleased at being able to receive and entertain the members of the two clubs represented, and would willingly extend to them an invitation to come again next year. And then, our over-kind host attending us to the very door, we were sent away with clouds of Havannah pouring from our lips; and, as one last parting touch of the new science, we lit our cigars by an electric lighter, which hangs convenient in the hall, and just as the sun was setting drove off down into the city of pantiles.

PHOTOGRAPHY WITHOUT LIGHT.

For a long time, according to Professor A. E. Dolbear, it was believed there were three different kinds of ether waves, known as heat, light, and actinic rays. The latter were supposed to be the ones that produced the chemical action on photographic plates, while light consisted of rays of a different kind, capable of affecting the eye. It was discovered, however, that the same rays that can produce vision can also heat a body, and also do photographic work, and what any ray can do depends upon the kind of matter it falls upon, so that all rays have similar characteristic properties. This discovery makes it plain that there is no peculiar kind of ether waves which can be called light, as distinguished from other kinds of ether waves. What is called light is a physiological phenomenon, and has no existence apart from eyes. So well assured is this, that the serious proposal is made to banish the word "light" from physics. The sensitive coating upon a photographic plate is an unstable chemical compound, which may be broken up by mechanical pressure, by heat or by ether waves. The proper wave-length for a given plate depends upon the nature of its surface. The tanning of the skin, the darkening of newly laid shingles, the colouring upon apples and other fruits, is a photographic process, as can be shown by shielding them from the sun's rays. It has long been known by photographers that pictures may be taken with ether waves much too long to be seen by the eye, if some other substances are used in place of the simple silver salts in common use.

Since it has been shown, according to the Professor, that ether waves of all lengths have an electro-magnetic origin, it has been apparent that all the effects of light can be duplicated with suitable electric apparatus. Lay a coin, like a half-dollar, on a plate of glass, and let a few sparks from an electric machine fall on it. Remove the coin, and the glass surface will not appear to have been affected; but, if it be breathed on, the image of the coin will at once be seen, and that it is really engraved on the glass surface is evident, for it will not easily rub off. If a piece of

photographic paper takes the place of the glass, it must have the imprint of the coin made upon it. It is not needful to have the sparks fall upon the coin; for, if it be enclosed in a dark box, brought near to an electric machine having short sparks passing between its knobs, the ether waves set up by the latter will be sufficiently short to affect the photographic surface, which may be developed afterwards in the ordinary way. So it is actually possible to take a photograph of an object in absolute darkness, with the ether waves set up by working an electric machine. Not much has yet been done in this direction, but it is a new clue to chemical possibilities, and one may confidently look forward to the time when the qualities and colours of surfaces of many things will be changed to suit the taste by an application of electric waves of suitable length to bring about the proper chemical reactions, and an electric machine may become a necessary adjunct to the apparatus of the photographer.

PHOTOGRAPHIC EXHIBITION AT THE ROYAL AQUARIUM.

On Tuesday last, September 11, what was announced as a great "Optical" and Photographic Exhibition was opened at the Royal Aquarium, Westminster. We shall dismiss the purely "optical" as distinguished from the photographic part of the display, with the remark that the extent and importance of the former are far inferior to its interest. The attempt to include in a photographic exhibition a section devoted to apparatus and instruments employed in allied sciences can scarcely be pronounced successful, and we are probably justified in the conjecture that the Exhibition will stand or fall by its photographic character alone. As a photographic exhibition it is unquestionably deeply interesting and instructive, and for this great credit is due to its organizer, Mr. E. A. Du Plat, who, in the face of many difficulties, and some amount of prejudice existing in the photographic world against the holding of exhibitions at places of entertainment like the Aquarium, has brought together a collection of exhibits which, especially in the department illustrative of photo-mechanical and photo-chromographic printing, is worth going many a mile to see. The photographic apparatus section might have been larger and more representative, but what there is shown in it is good and varied. We may say that the guide and catalogue is prefaced by an able introduction, and some fragmentary facts relating to photography, by Mr. Du Plat, and an outline description of the principal photo-mechanical printing processes, which is also a useful compilation.

The apparatus is displayed on the main floor.

Although not strictly belonging to this department, the Platinotype Company's stall is one of interest, and is educational. Here are not only specimens of the work, but the process of exposure and development is shown as in every-day practice.

J. F. Shew & Co. exhibit a selection of cameras and apparatus, notable among them being the Eclipse camera in various forms and in its various modifications.

The object which, standing proudly pre-eminent in the case of J. H. Dallmeyer, Limited, first fills the eye, is a magnificent telescope, equipped with every appliance for sidereal work in the behests of the new astronomy, about which we have written a good deal of late. Here are also a large collection of photographic lenses, together with the "Naturalists' hand camera," and a variety of other hand cameras and tele-photo lenses of high and moderate power.

W. Wray's exhibits comprise a three-inch aperture astronomical telescope, an altazimuth stand, an equatorial mounting for telescopes, a microscope complete with objectives and eyepieces, and a large collection of photographic lenses of every kind and size. We also observe in this exhibit a variety of lantern projection lenses, and a large astronomical object-glass in cell.

The case of J. Swift & Son is well stocked with the various optical productions for which this firm is so well known. (By the way, we miss seeing the entry of these exhibits in the catalogue, but one cannot miss seeing the case of exhibits itself.)

J. Pillischer shows microscopes, telescopes, meteorological and ophthalmic appliances.

T. Aston & Son, Birmingham, have quite a variety optical show. This includes stereoscopes and slides, opera and field glasses, spectacles and eyeglasses, and a considerable assortment of stand and hand cameras, some of which are of new designs.

Probably the largest exhibit in the building is that of Walter Tyler, whose speciality is the lantern. Here we have lanterns of every conceivable class, with lamps, burners, regulators, reading lamps, and everything intimately or remotely connected with the lantern.

Burton & Co.'s exhibits consist of photographic mounts of every description, including plate-sunk, platinotype, and view mounts.

W. R. Clark, Camberwell, has several circular diffraction gratings, 5400 lines to the inch, for use with the lantern.

J. Theobald & Co.'s exhibits consist of lanterns and slides. They show in operation the transference of chromo-lithographs from paper to glass.

Bowen & Co. have a case containing solid drawn opticians' aluminium tubes; also sheets, wire, and castings, all of this metal.

Airs & Co. have "Bessus" plate and film-holders, jet-centerers, and biunial lanterns.

There is a large collection of lantern transparencies exhibited by James Dore, Sandown, I.W.

Various appliances in connexion with ophthalmic surgery are exhibited by Curry & Paxton.

The Automatic Sight-testing and Optical Supply Company also have a good show of aids to vision in the form of spectacles.

The Photochrom Zurich Company have a stand of their much-admired "natural colour" photographs, which are sure to elicit admiration by their artistic beauties. Views at home and abroad are included in the display, which strikes an admirable "note of colour" among its brazen surroundings.

The competitive and loan collections will be found in the galleries. In the competition organized by the Exhibition authorities we notice many familiar works by E. Dockree (architecture, photo-micrographic slides, lantern slides), J. H. Gear, Edward Hawkins, H. N. King (whose views in the Royal palaces are examples of faultless technique), R. H. Lord (*How's that?* &c.), W. P. Marsh (a selection of his always welcome marine studies), Douglas Pym, and others. Frankly, this part of the Exhibition is rather weak, and scarcely calls for detailed critical notice. The competition organized by *Pearson's Weekly* is numerously patronised.

The main interest of the Exhibition will undoubtedly be focussed in the Loan Collection, which handsomely redeems its promise of being educationally valuable. Mr. Burchett shows some of his charming figure studies, notably the exquisite *Belle Bretonne* and *Girl with Violin;* Mr. C. Court Cole, some of his Oxford Cathedral interior series; Mr. W. England, Alpine views; and other representative workers in pictorial photography, who send well-known examples of their powers are Messrs. Horsley Hinton, A. Keighley, and Mrs. Main and Mr. R. Terras. Mr. E. J. Wall, who is one of the Judges, lends a large collection of competitive prints. We were specially pleased with some fine examples of portraiture by Mr. Vernon Kaye, the lighting and posing of the sitters being most artistically done. Mr. Gambier Bolton sends a great many of his animal studies, most of them being well known. These are sure to attract and delight the general public, who will need no second invitation to recognise in Mr. Bolton a master of this difficult branch of work.

The pictorial and scientific sides of the loan collection are about equally divided. In the latter, Mr. A. Caplatzi shows numerous obsolete forms of telescopes, microscopes, &c., and Mr. M. W. Dunscombe sends a unique collection of spectacles, ancient and modern. The proprietors of the *Graphic* have two cases illustrative of the processes of wood engraving and zinco work *ab initio* to the finished print, all the intermediate stages in the preparation of the blocks being shown. They also show numerous black and white drawings. This collection deserves careful inspection. A series of about eighty calotype negatives, taken by the late Mr. Wiggin, of Ipswich, are also on view.

The Autotype Company have some fine autotype enlargements, and Messrs. Bedford Lemere, & Co., show to what a pitch of technical excellence it is possible to bring architectural and interior photography. A capital exhibit is that of the "E. R. A." Company, their examples of half-tone work being remarkably good. Messrs. Hare & Co.'s colour work in from two to six printings; and the examples also sent by Messrs. Husnick & Hausler, of Prague, show this branch of reproduction to advantage, and will prove instructive in giving an insight into the methods adopted to secure colour effects.

The Photochromatic Company of Belfast also have some very beautiful specimens of colour work. Messrs. S. B. Bolas & Co.'s exhibit illustrates, *inter alia*, the stages of a collotype print, and Mr. H. Wilmer does the same for photogravure, and in this section will also be found exhibits illustrating the construction of wood blocks; the picture photographed on wood, partly and finally engraved (Messrs. Cheshire); stages in the production of a Woodburytype (Eyre & Spottiswoode); materials and apparatus used in the various photo-mechanical processes (Penrose & Co.), and many other highly instructiue exhibits connected with block and colour work. Messrs. Sprague have a fine exhibit of their ink-photo process. On the whole, as we said at the outset, this section will be found well worth studying. Its interest is such that it is impossible to do justice to it here.

The Exhibition remains open till October 6, and we may seek an early opportunity of returning to some of its more salient features. In the meanwhile, all those taking part in it are to be felicitated on its success.

Our Editorial Table.

Photographische Chemie.

By R. Ed. Liesegang. Düsseldorf: Ed. Liesegang, Verlag.

In this work the author treats, with ability and succinctness, of the chemical principles suggested by the action of light on silver salts; development, toning and fixing; platinotype, the chromium and other processes. The book is published at 2 marks 50.

The Churches of Shropshire.

By D. S. Granage, M.A. Wellington: Salop, Hobson & Co.

We have received the first volume of *An Architectural Account of the Churches of Shropshire* by D. H. S. Granage. It treats of the churches in the hundred of Brimstree, concerning which it gives much information of archæological and architectural interest. From a photographic point of view, the chief attraction of the volume is a series of excellent collotype reproductions of photographs of churches, from negatives by Mr. M. J. Harding. The churches depicted are Claverley, Shifnal, and Tong, and the photographs are extremely fine. The firm above named receive subscriptions for the entire work.

Convention Photographs.

By J. Stuart, Glasgow.

Except when photographing the group of members at the Edinburgh Convention, we do not remember having seen Mr. Stuart with a camera at these annual gatherings until the Dublin meeting. Judging from specimens sent us, he is certainly able to give a good account of himself. While so many others use hand cameras or similarly small instruments, Mr. Stuart's camera was one of whole-plate dimensions. As might have been expected of one so skilled in pictorial art as this gentleman, Mr. Stuart's photographs are as excellent pictorially as they are technically perfect. In one we have a man sitting all alone by a rocky pool, there being only the faintest bit of sky visible. There are two poulaphouca pictures, one near to the bridge the other being taken from a point lower down. In the latter it requires but little effort of imagination to hear the noise of the roaring torrent. There is a group on the steps at Powerscourt, singularly soft and delicate An ivy clad tower adjacent to a church, an interior of St. Patrick's and a view of a party at lunch in the open all equally attest Mr. Stuart's skill in using the camera.

Convention Snap-Shots.

By F. W. Hindley.

We have said more than once that Mr. F. W. Hindley (Jonathan Fallowfield) is one of the most expert snap-shottists we know. He well sustains this character in some hand-camera pictures taken at the Convention. Those sent to us are portraits of well-known members, at once recognisable. We prize these and similar snap-shot productions, as they recall happy memories.

Stereographs of Norwegian Scenery.

By F. A. Bridge.

We are very glad to find that Mr. Bridge has entered the increasingly popular and always delightful field of stereoscopic photography. We can predict, from the specimens received, that he has a successful career before him in this direction, because his subjects are interesting and attractive, his photography is faultless, the trimming and mounting of his prints are such as, when viewed in the stereoscope, to project the pictures behind the mount, and lastly, and most important, the pictures are mounted at such a distance apart as to cause easy coalescence in the ordinary stereoscope without straining of the muscles of the eye. We mention this also as a hint to several other friends, who seem to persist in mounting the prints too far apart.

News and Notes.

The Goerz Double Anastigmat. — At the Photographic Exhibition recently held at Erfurt a gold medal was awarded to Mr. C. P. Goerz, of Berlin, for excellence of photographic objectives.

Mr. C. C. Vevers, of 12, Market-street, Briggate, Leeds, sends us his latest second-hand list. It contains particulars of a great many bargains that appeal to the wants of both amateur and professional photographers.

Carbon Printing.—In reference to the letter of a correspondent in our issue of August 31, as to the makers of carbon tissue not supplying glass plates coated with bichromated gelatine for transparency work, Messrs. Elliott & Son, of Barnet, inform us that they supply such coated plates.

The Society of Amateur Photographers of New York. — Mr. H. Snowden Ward, 6, Farringdon-avenue, London, E.C., has consented to act as the European Secretary of the Photo-mechanical Exhibition to be held by the Society of Amateur Photographers of New York. Prints, &c., intended for the Exhibition coming from any part of Europe should be sent to Mr. Ward, at his address given above, carriage prepaid, on or before October 15, 1894. They will be forwarded by Mr. Ward to the Society at the expense of the Society.

South Australian Photographic Society (Founded 1885).—The following are the officers:—*Patrons:* His Excellency the Right Hon. the Earl of Kintore, P.C., G.C.M.G., Sir E. T. Smith, K.C.M.G., Sir Charles Todd, K.C.M.G., Hon. Dr. J. A. Cockburn, M.P., Professor E. H. Rennie, M.A., D.Sc., Professor W. H. Bragg, M.A., Mr. J. J. Green.—*Past Presidents:* Messrs. S. J. Dailey and G. Stace.—*President:* Mr. C. F. Clough, Assoc. M. Inst. C.E.—*Vice-President:* Mr. E. W. Belcher.—*Committee:* The Executive Officers and Messrs. G. Stace, P. A. Roberts, and A. W. Dobbie.—*Hon. Librarian:* Mr. J. D. Dixon.—*Hon Treasurer:* Mr. R. B. Adamson, Belgrave-terrace, College-town.—*Hon Secretary:* Mr. A. H. Kingsborough, Childers-street, North Adelaide.

The Hackney and South London Photographic Societies' Exhibitions.—In order to save trouble, expense, and inconvenience to intending exhibitors at these Exhibitions, the Hackney Photographic Society is prepared to collect exhibits from the Exhibition of the Royal Photographic Society of Great Britain, Pall Mall, and at the Salon, and deliver them at Morley Hall, Hackney, in time to be shown there, at the following charge, which includes carriage, viz., 6*d.* each picture, with a minimum charge of 1*s.* 6*d.*, and 3*d.* each set of lantern slides. The South London Photographic Society will be prepared on similar terms to collect exhibits from Morley Hall, and to deliver them at the Public Baths, Camberwell, in time to be included in their Exhibition. The fees in each case to be paid to the Society receiving the exhibits.

The South London Photographic Society's sixth annual Exhibition will be held at the Public Baths, Church-street, Camberwell, S.E., on November 27, 28, 29, and 30, and December 1, 1894. The following classes are open to members only:—A, portraiture and figure study, including animals; B, architecture; C, landscape and seascape, above half-plate; D, landscape and seascape, half-plate and under; E, enlargements; F, lantern slides; G, excursion pictures. The following are open classes:—H, pictures which have previously received an award; J, pictures not previously medalled; K, lantern slides which have previously received an award; L, lantern slides not previously medalled. Entry forms and further information respecting the Exhibition can be obtained from Chas. H. Oakden, Hon. Secretary, 51, Melbourne-grove, East Dulwich, S.E.

Photography in Sydney, N.S.W.—A friend sends us the following advertisement from a Sydney contemporary:—"A Marvellous Offer. Messrs. Peel & Co. are now supplying twelve highly finished cabinet portraits, and an enlargement of the same sitter, finished in the best style of high art, size 20×15, in a first-class 3-inch gilt frame, size 24½×19½ for 12*s.* 6*d.* The frame alone is worth more than the money. The usual price for the frame and enlargement is 2*l.* 2*s.*; nevertheless, Messrs. Peel & Co. are giving the enlargement framed and the twelve cabinets as above for 12*s.* 6*d.* To copy from another photograph is 12*s.* 6*d.* for the enlargement and frame without the cabinets. Messrs. Peel & Co. have a number of these enlargements on view in their newly built vestibule, and guarantee every order supplied equal to them in every way. There are no conditions other than paying the 12*s.* 6*d.* The framed picture is much larger than this newspaper. Messrs. Peel & Co. have always maintained a high reputation for artistic portraiture, and they assure the public that this reputation will always be jealously guarded. Patrons have a guarantee of modern posing, effective lighting, and high-class finish both in the portraits and in the framed enlargement. Peel's Studio, 482, George-street, Sydney. Note.—Peel's entrance is a part of Beale's sewing-machine warehouse, and has no other connexion."

At the City of Manchester Municipal Technical School, Princes-street, during the Session 1894–5, a course of lectures and demonstrations will be given on Photography by Mr. C. F. S. Rothwell, F.C.S., fully illustrated with the aid of the most modern apparatus and by means of demonstrations carried out in a thoroughly practical manner. They will extend over about thirty evenings. The following is the syllabus:—I. Introduction—History of Photography. II. The "Dark Room"—Lighting of the "Dark Room"—Testing the Safety of the Illumination. III. and IV. Photographic Optics—The Form and Construction of Lenses, and their selection and use for special purposes. V. and VI. Cameras—The use of various movements—Tripods. VII. Instantaneous Shutters—Efficiency of various forms of Shutters. VIII. Exposure of Plates—Methods of Measuring—Correct Exposure. IX. Chemistry of Photography in Application to the Preparation of Plates and the Action of Developers. X. The manufacture of Gelatine Plates. XI. Developers and Development—Ferrous oxalate and pyrogallic acid methods. XII. Development continued Amidol—Hydroquinone—Metol—Rodinal and Glycin. XIII. Fixing—Intensification and reduction. XIV. Theories of the action of Light on Silver Salts—Hurter & Driffield's Experiments. XV. Testing the Speed of Plates and Shutters—Isochromatic Plates and Screens. XVI. Copying engravings and printed matter. XVII. Hand Cameras and Hand-camera Work—Films and Film Photography. XVIII. Silver and Gelatino-chloride Paper Printing—Vignetting—Printing-in Clouds. XIX. Toning—Fixing and Enamelling Prints—Blue Process—Copying Engineers' Drawings. XX. Wet Collodion Process—Positive and Negative Processes. XXI. Bromide Paper—Printing and Enlarging—Lantern Slide making. XXII. Carbon Printing—Single and Double Transfer. XXIII. Platinotype Process. XXIV. Application of Photography to Scientific and Industrial Processes.

Dr. A. A. Common on Celestial Photographs.—In the course of a review of Dr. Roberts's book on *Star Photographs* Dr. A. A. Common says: "Had Dr. Roberts' work been only to produce the first photograph, that of the great nebula in Andromeda, and had that been the only result of all his labour, he would have been amply repaid, for it is certainly not too much to say that, in this picture, photography has done more to justify its use by the astronomer than in any other case; and one can feel that the hopes that were formed by Rutherford and others in the early days of photography, and which lay dormant for so many years, have now been realised. The perfection of delineation enables the true character of this marvellous object, which remained hidden from the closest scrutiny of such a careful and competent investigator as G. P. Bond, to be at once seen and appreciated. It is difficult to

imagine hat such an enormous object, as the Andromeda nebula must, be not very near to us; perhaps it may be found to be the nearest celestial objec of all beyond the Solar System. It is one that offers the best chance of the detection of parallax, as it seems to be projected on a crowd of stars, and there are well-defined points that might be taken as fiducial points for measurement. Apart from the great promise this nebula thus seems to give of determining parallax, there is a fair presumption that in course of time the rotation of the outer portion may perhaps be detected by observation of the positions of the two outer detached portions in relation to the neighbouring stars. The photographs are arranged in order of right ascension, each has its position given, and many have marked fiducial stars whose position is given for 1900. The scale of enlargement is also given, so that with the help of a table of corrections of errors due to the slight alterations in scale in enlarging or printing, any point on the photograph can be determined with an accuracy sufficient at least for purposes of identification. For some purposes, no doubt, it will be absolutely essential to have recourse to the original negatives; but, as Dr. Roberts has pointed out, there are many purposes for which these paper copies are available. In addition to the full date of each object, which is admirably done, there are various useful references to previous observations. The accuracy with which the telescope is kept pointed during a long exposure is seen by a glance at the shape of the brighter star images, as a shift, if not at once corrected, produces deformation. In nearly every photograph the stars are round, in some they seem absolutely so, which shows the perfection of the instrumental arrangements of Sir Howard Grubb and the care with which the exposures have been made. Some of the star photographs—as, for instance, plate 43—show a perfection of image and an absence of distortion over a large field that is very satisfactory. A comparison with a plate of the same region taken by an International Chart refractor would be interesting. In looking at the examples of spiral nebulæ, of which there are several, one cannot help thinking of Lord Rosse and the correctness with which he delineated these objects, though his views at the time were not generally accepted by astronomers. These most interesting nebulæ will repay further study, perhaps, more than any other. Some of the cluster photographs are too much enlarged for the ordinary distance at which one reads a book, but the proper effect can be obtained by looking at them about three feet away. All the photographs are about as good as it is possible to take with an instrument of the size used by Dr. Roberts and the present dry plates; better photographs can only be obtained by the use of a larger telescope, or by means of dry plates that will, with the same or greater sensitiveness, give a finer grain. This is shown by a comparison of the photograph of the cluster M. 5, taken by Dr. Roberts, with one taken with a larger telescope of a similar kind. Dr. Roberts states (p. 91) that 'the cluster is inclosed in dense nebulosity about the centre—the nebulosity hides the stars, even on the negative;' but an inspection of the photographs by a larger instrument shows that the stars are quite distinct, though the exposure was very much longer, a result that might fairly be expected. A comparison of photographs of this object, taken at different dates, shows that many of the stars of this cluster are variables, and, of course, it is just possible that there may be variability in the central portions. Excellent as are the paper reproductions of these photographs, they cannot give all the beautiful detail to be seen on the original negative of a nebula. If change be taking place, it is more than likely that it may be seen in the finer detail first, in which case the original negative must be seen. This points to the absolute necessity of preserving the negative where it shall be available in after-years. We hope that all valuable originals will fine their way eventually to the keeping of the Royal Astronomical Society, which now undertakes this important duty."

Professor Hermann von Helmholtz, whose colour theory has so often been referred to in our pages in connexion with the heliochromic work of Ives and others, died on Saturday last at Charlottenburg. "It is curious," says a contemporary, "that in Germany, where specialism reigns supreme in everything, it should be so common to meet men distinguished in different and widely separated departments of research. Helmholtz was a physician, a professor of anatomy and physiology, having held appointments at Berlin, Koenigsberg, and Heidelberg, and continued such to the end, and yet his fame will rest chiefly on his inquiries in physics and mathematics, which he even applied to physiological phenomena. More, perhaps, than any of his contemporaries, he realised the importance of investigating the laws of electricity, optics, and sound as they affect living beings and vital processes. But, wholly apart from these researches, Helmholtz will always be held in reverence in connexion with the great law of the Conservation of Energy. This doctrine, and that of Evolution, are unquestionably the most important, because the most general of the scientific theories of the nineteenth century. There is this difference, however, between them—that whereas Darwinism is still a hypothesis, open to discussion, and rejected by some eminent naturalists, there is no question anywhere about the great law which Helmholtz was the first to state in exact terms, that the sum total of the forces at work or quiescent in the universe is always the same. They may exist as heat, gravitation, electricity, chemical affinity, cohesion, or matter in motion; as forces they may be transmuted into one another, but they can never be lost or destroyed. Just as Science teaches that no power in the universe but that of its maker can annihilate a grain of sand or an atom of oxygen, so it asserts that the energy of a ray of light, of a planet's motion, of a falling stone, or a burning coal, can never be extinguished. This doctrine was implicitly stated by Newton, who, however, himself, as well as his successors, failed to grasp the vast significance of what he had laid down. It received immense importance when Dr. Joule, of Manchester, demonstrated that a degree of heat was always an exact equivalent of the same amount of work, and much of the best labour of Lord Kelvin has been done in the development of the theory and the reconstruction of Natural Philosophy on this basis. It was Helmholtz, in his famous memoir, *Die Erhaltung der Kraft*—which we now translate Conservation of Energy—who first expounded the law in its present form in 1847. To English readers the name of Helmholtz has been rendered familiar by his remarkable speculations on the origin of the sun's heat, and the time the great luminary, on which the life of the solar system depends, is likely to last. Adopting the idea that the sun became a hot body by the collision of the particles of which it is composed—drawn together possibly from enormous distances by their mutual attractions—Helmholtz showed that this, and no other suggested process, would explain the millions of years during which the source of our heat has certainly been in existence. Sir William Thomson (now Lord Kelvin) worked out this hypothesis, and he has shown that it will afford the geologists twenty million years for the probable past of the globe, and give humanity ten million years to come before the sun himself grows dim with age and nature sinks in years. The geologists are not likely to be content with less than a hundred million years for the world's history, and it is quite possible that in the end the higher limit may be extended thus far. By remarkable calculations Helmholtz proved that the work done by the contraction of the sun's mass one-tenth per cent. of his diameter, would give off heat enough to serve the earth and its fellow-planets for twenty thousand years. In another still more marvellous line of research, Helmholtz and Lord Kelvin have been associated. In 1858 the eminent German physicist proved mathematically an astounding theory, to the effect that in a perfect fluid vortex motion—such as the tobacco-smoker often sees in the shape of smoke-rings—would be eternal. Such rings would continue to revolve, and nothing would be able to separate, divide, or destroy them. Lord Kelvin took up this startling conclusion, and built upon it a theory of the universe. This perfect medium (the ether of space) and these vortex motions, said the great English physicist, represent the universe. A perfect fluid fills all space, and the things we call matter are portions of this fluid animated by vortex motions. It is probably at once the most abstruse and most daring physical theory that was ever propounded. Unfortunately it is one on which only a possible senior wrangler is legitimately entitled to express an opinion, so deeply plunged is it in an abyss of mathematics. In the realm of optics Helmholtz was the author of a theory of colour."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,790.—"Automatic Hand Camera." A. McLucas.—*Dated September*, 1894.

No. 16,844.—"Improvements in or connected with Photographic Shutters." W. Oehmke and C. P. Goerz.—*Dated September*, 1894.

No. 17,097.—"An Improved Apparatus for Enlarging from Photographic Negatives or Positives." T. P. Bethell and J. W. Rhodes.—*Dated September*, 1894.

No. 17,125.—"Improvements in Albums for Photographic Prints." P. T. Johnson.—*Dated September*, 1894.

No. 16,916.—"An Improved Apparatus for Manipulating Lime and Electric Lights, and the Boxes used therewith." H. Taylor.—*Dated September*, 1894.

PATENTS COMPLETED.

Improvements in Saturators and Jets for Producing Oxyhydrogen or Limelight.

No. 18,224. Alfred Suiter, 32 Newington Butts, Surrey.—*August* 4, 1894.

When saturators are used for producing the hydrogen element for oxy-hydrogen or limelight, the flame is apt to pass or pop back, or fire into the mixing chamber of jet, and so interfere with the working of a dissolver.

The object of this invention is to prevent this popping back, to reduce the weight and bulk of the apparatus, and to reduce the time in getting the apparatus in the best working order to give the most brilliant light.

In carrying out my invention, I combine the saturator and jet in one, and employ a cistern—which may be stuffed with porous material or not—to hold benzoline or other suchlike volatile material. I use the mixing chamber or burner of the jet as a saturator, by stuffing it with some porous material which dips down, or is connected with the cistern of volatile material, much the same as a wick in an oil lamp. By these means, the saturator portion gets warm in a very short space of time, as it is in absolute contact with the flame, and its forming only such a small proportion of the whole apparatus.

To regulate the temperature so that substances of a less volatile nature than even benzoline can be used, and so that an excess of vapour can be produced—so preventing the flame having a tendency to pass or pop back—I fit the saturator portion with a sheath with projecting arm or arms, and capable of adjustment to or from the flame, so as to conduct more or less heat to the saturator portion as may be required. In practice, I find it is not absolutely necessary to have this heater adjustable if placed a prearranged distance from the flame, according to the volatility of the material being used.

The claims are:—1. In saturators for producing limelight, the use of the mixing chamber or burner of jet as a saturator or vapouriser. 2. The use of a sheath or heater fixed or adjustable substantially as herein described.

An Automatic Image-finder for Lenses and Mirrors.

No. 15,387. Richard Creagh Bodkin, St. Vincent's College, Castleknock, County Dublin.—*August* 18, 1894.

The automatic image-finder for lenses and mirrors is an instrument by means of which an object placed in any position immediately indicates where its image must be, and proves experimentally that the image is there. The instrument consists of an object (A), capable of being moved with ease into various positions.

From the extremities of this object proceed two parallel rays (in the shape of wires) along which it travels. These parallel rays, according to theory, are

always refracted to the principal focus (B), and so the ray or wire passing through B represents the path of one of them.

The direction of this ray or wire is, therefore, always constant, no matter where the object is placed. The only thing then to be determined, is at what point the rays intersect the secondary axes. Now, the secondary axes are always straight lines drawn from the extremities of the object and passing through the centre of the lens. Hence, in the instrument, there are two wires passing through the centre of the lens and also through the extremities of the object. These wires work on a pivot, and so are capable of moving in or out according as the position of the object requires. The object can slide along them, and by its motion, open or close them, owing to the fact that these secondary axes pass through two eyes or similar fittings, placed on the extremities of the object. Thus, the point at which the parallel rays and the secondary axes must meet is shown, and so the position of the image.

The focus (B) is capable of being altered, as it slides in a groove or other adjustable fittings, to suit lenses of different focus. In the case of concave lenses, the only change to be made is to place the focus (B) at the opposite side, where a similar adjustable fitting is also provided. To prove experimentally that the image is really at the place indicated—a candle lamp, electric lamp, or similar light-giving source, is placed immediately over the object (A). Over the section of the lens is placed a glass lens of known focus, the refracted parallel ray passing through the principal focus (B) is fixed to the focus of the lens—a screen is placed at the point where the parallel rays intersect the secondary axes, and immediately a sharp image of the object appears on it.

The claim is:—An automatic image-finder for lenses and mirrors, by means of which an object placed in any position immediately indicates where its image must be, and proves experimentally that the image is there substantially as described.

Improved Means and Apparatus for Securing Accurate Focus Registration in Photographic Cameras.

No. 17,060. Thomas Rudolph Dallmeyer, 25, Newman-street, Oxford-street, London.—*August* 11, 1894.

This invention relates to improved means and apparatus whereby the accurate focussing of the object on the plane where the sensitive film is to receive the impression can be verified without the use of the ground-glass screen, in such manner that it shall be absolutely certain that the image of the object will be clearly registered on that plane when the sensitive film is exposed.

For this purpose I employ the following devices:—

According to one arrangement, I form an opening in the top of the camera, and near the front edge of this opening I place a mirror (preferably) in a plane parallel to that occupied at the back of the camera by the sensitive film when the exposure is taking place. The aforesaid mirror is enclosed in a box which covers the opening in the top of the camera, and from which box light is excluded, except what may be reflected to it after passing through the lens. An inspection opening is made in the aforesaid covering box at a point so placed that the image of the object registered on the focussing surface at the back of the camera is reflected to the aforesaid mirror, and thence to the eye, so that the eye, looking at the said mirror, sees the reflection of the image on the focussing surface, and absolutely accurate focus registration can thereby be secured, with the advantage that the operator sees the image while facing the object itself.

The focussing surface employed may be the roller-blind shutter, when such is employed, or the back of the dark slide, for example, the said surface being in either case preferably whitened.

When the sensitised plate is normally placed or stored behind the plane occupied by the focussing surface at the time when the focussing is effected, I arrange so that the sensitised plate can be moved forward after the focussing has been effected, but before exposure, in order that its surface may occupy exactly the position previously occupied by the focussing surface, whereby the registration of the image on the sensitised plate is exactly the same as that on the focussing surface.

According to another arrangement, I place in the camera, behind the lens and at an angle of 45° with the axis thereof, a mirror or totally reflecting prism, which reflects the rays of light passing through the lens in a direction at right angles to such axis; these reflected rays of light are received on a second mirror or totally reflecting prism placed in a plane parallel to the first, and are reflected therefrom in a direction parallel to the axis of the lens. The second mirror is placed at the front end and in the axis of a telescope tube, the rear or eyepiece end of which is preferably placed towards the rear end of the camera. On looking through the telescope, the reflected image of the object is seen by means of the mirrors or prisms. In this way the lens itself becomes the object-glass of the telescope, and the exact focus of the image seen through the telescope, so as to coincide with that which would be registered on the focussing surface, if there were one, or on the sensitised plate when the latter is exposed, is effected in the following manner for each person using the camera fitted with this arrangement.

The person who is to use the camera focusses a suitable object on the usual glass screen by direct vision in the usual way, the first above-mentioned mirror being, for the time being, moved out of the way. He then replaces the said first mirror and focusses the telescope until he can see the reflected object therein as clearly and as well defined as he saw the object on the glass screen by direct vision through the lens. Whenever after that the same operator, with the same focussing of the telescope, so focusses an object with the lens so as to bring the reflected Image of that object clearly and well defined to the eye at the telescope, he may be quite certain that he has absolutely accurate focus registration on the sensitised plate.

The last-described arrangement is more especially applicable to what is now known as tele-photography, but it may be more or less applicable to ordinary photography.

The first of the two mirrors mentioned in the last-described arrangement is preferably removed by suitable mechanism from behind the lens previous to and during the exposure of the plate but instead of removing it entirely, it may be turned edgewise, so that it is in a line with the axis of the lens, with its back, which should be blackened, towards the second of the two mirrors, or, in some cases, towards the side of the camera. The few rays of light cut off from the plate by the mirror thus presented edgewise to the lens do not materially affect the image formed on the plate.

The claims are:—1. The improved means for securing accurate focus registration in photographic cameras, which consists in the employment of mirrors, or totally reflecting prisms, so arranged and adapted as to reflect the image of the object through an observation opening or eyepiece, in such a manner that it appears to the operator as clearly and sharply defined as it is, or would be, on the surface of the focussing-screen, or on the sensitised plate, substantially as described. 2. In a photographic camera the arrangement and adaptation of a mirror, and an observation opening, or an eyepiece, whereby the image of the object formed by the lens on a surface coincident with that of the sensitised plate when exposed, is reflected to the eye of the operator placed at such opening or eyepiece. 3. In a photographic camera the use of one or more mirrors, or of one or more totally reflecting prisms, so arranged and adapted that the image of the object formed by the lens is reflected to the eye of the operator through an eyepiece in exact registration with the image that would be formed on a surface coincident with that of the sensitised plate when exposed.

Improved Method of and Means for Operating the Colours or Coloured Glasses connected with Limelights.

No. 18,623. Ernest Sewell Cooper, Ivy Cottage, Manchester-road, Milnsbridge, near Huddersfield, Yorkshire.—*August* 11, 1894.

This invention refers to the coloured glasses or plates which are introduced in front of the lens of the lime-box for throwing varied colours upon scenery, persons, or objects for producing changing and pleasing scenic or coloured effects.

At present the colours or glasses are separate or detached, and have to be picked up by hand one at a time and introduced into grooves formed in the lime-box, in which grooves they are slided into position in front of the lens and limelight. This manipulation of the glasses, in addition to having to attend to the light and angle of the lime-box, is a disadvantage, especially when, as is usually the case, there is but little room for the operator to work in, and frequently the glasses are let fall and broken. The said glasses are also liable to jam in the grooves when being slided into position, or removed from the box, which not only delays the change from one colour to another, but in many cases spoils the effect.

My invention is intended to provide means whereby the glasses or colours can be placed in front of, or removed from, the lens with ease and certainty, and without liability of breakage.

In carrying out my invention I mount the frames or glasses preferably upon hollow shafts or tubes, one for each glass, said shafts being arranged concentrically, and adapted to work one within the other.

The outer shaft or shell is supported in suitable bearings attached to or formed on the side of the lime box, and to the opposite ends of the series of shafts are secured lever arms of different lengths, by which any of the shafts can be turned round at will. Each lever is provided with a button or stud to form a handle.

The said buttons may be affixed to studs, which are provided with spiral springs, so as to enable them to yield slightly to pressure, and said studs may also answer as stop pieces to limit the movement of the glasses.

The levers are situated at the rear of the lime box, and, by moving any of them round a part of a revolution, the glass or colour connected therewith is brought in front of the lens and limelight, and, by moving a second lever in the reverse direction, the glass already in front of the limelight is withdrawn; thus any colour can be brought into play and removed by the turning of the levers corresponding thereto, which may be marked or coloured so as to prevent mistakes.

By this means the glasses are always in position, ready for being moved in front of the lens, and, being secured to the shafts, they are not liable to fall or get misplaced in making rapid changes; their action is quick, certain, and smooth, and the operator has much less trouble in making the changes.

A stop-piece on the side of the lime box limits the outward movement of the glasses, and the base of the lime box in front of the lens is preferably lined with indiarubber, felt, or other suitable yielding substance or material to form a cushion or bed for the glasses when moved down in front of the light, and to break their fall if allowed to descend too rapidly.

Instead of hollow shafts working one within the other, solid shafts, arranged at the side of the lime box, may be employed and actuated as before described.

Glasses or plates with views or subjects thereon may be removable from the frames, which are fast with the shafts, so that others can be substituted.

Improvements in or relating to Limelight Apparatus.

No. 2365. George Wright Gwyer, jun., 64, Cotham-road, Bristol, Gloucestershire.—*August* 11, 1894.

My invention relates to the substitution or use, in place of the ordinary limelight jet tray, of an apparatus of almost equal portability forming a support for the limelight jet, and also a saturator, which can be used with an ordinary limelight jet. The apparatus may, by a shifting of the usual rubber tubing, be at once worked either with oxygen and hydrogen in the usual manner, or as an ether saturator in combination with oxygen alone; the change from one form of light to the other being made without removing either the jet or any part of the apparatus from the lantern.

In carrying out my invention I construct a flat, closed metal case or box, similar in shape to an ordinary limelight jet tray and preferably about one inch in height. This forms the combined saturator and "tray," the interior being divided into a series of communicating chambers so that the gas in passing through is forced to take a zigzag, up-and-down or tortuous passage, to ensure thorough saturation by the fluid in the vessel, the interior being tightly

packed with suitable absorbent material. I prefer to introduce the gas by means of a spray, or perforated tube, and beneath or around the outlet pipe from the saturator I place a preferably trough or angle-shaped piece of metal perforated with small holes, whilst the remaining portion of the division or compartment is very tightly packed with absorbent material. This chamber, which I term the buffer chamber, serves to collect and absorb any excess of liquid which may be introduced into the saturator, and to take up any liquid which may be driven through the vessel, when an excessive pressure of gas is employed, and thus prevent it from being driven or escaping into the tubes or chamber of the jet. As a further check, I may cover the gas outlet from the saturator with perforated metal or similar reticulate material.

At or near the centre of the back of the saturator I provide an upright rod or tube to which an ordinary "jet" may be secured and held in position in any usual manner.

When it is desired to use the ordinary gases—oxygen and hydrogen—the saturator taps are turned off, and the saturator is not used except as a means of support for the jet; but when it is desired to use the saturator itself, the inlet to the saturator and the oxygen tube of jet are connected together by indiarubber tubes and a T or Y piece, or in other suitable manner, and the hydrogen tube of jet and the outlet from the saturator are also connected together by rubber tubing, the supply of oxygen being introduced through the third arm of the Y piece. The saturator tubes and jet may be supplied with ordinary valves or taps, or screw-down valves, in order to control the supply of gas to the saturator and jet.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
17	Leeds Photo. Society	*Architectural Studies in Normandy* (illustrated). E. H. Jacob, M.A.
17	North Middlesex	*Printing and Toning.* C. C. Gill.
17	Richmond	
17	South London	*Wet Collodion.* W. E. Debenham.
18	Birmingham Photo. Society	
18	Brixton and Clapham	*Enlargements and their Production.*
18	Hackney	*Photographic Perspective.* A. B. Hoskins.
18	Hastings and St. Leonards	
18	North London	
18	Paisley	
18	West London	
19	Brechin	
19	Bury	
19	Croydon Camera Club	*A New and Simple Enlarging Apparatus.* G. R. White.
19	Leytonstone	
19	Liverpool Amateur	Exc.: Furness Abbey. Leader, A.W. Beer.
19	Manchester Camera Club	
19	Photographic Club	
19	Southport	
19	Southsea	
20	Birmingham Photo. Society	
20	Glossop Dale	
20	Greenock	
20	Hull	
20	London and Provincial	Demonstration of the *Klic Process of Photogravure.* Horace Wilmer.
20	Oldham	
20	Oxford Photo. Society	
21	Cardiff	
21	Central Photographic Club	
21	Croydon Microscopical	*Animal Photography.* T. Fall.
21	Holborn	
21	Leamington	
21	Maidstone	
21	North Kent	
22	Hull	
22	Leytonstone	Exc.: Pitsea. Leader, G. H. Cricks.
22	South London	Exc.: Shirley Hills. Leader, Mr. Moss.
22	West London	Excursion: Waltham Abbey.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 6,—Mr. W. D. Welford in the chair.

Mr. A. Cowan had been experimenting with Mr. A. L. Henderson's formula for toning after fixing, and found the addition of an acid was not necessary; he had toned with platinum in an alkaline sulphocyanide bath; he further thought that an acid state of this bath was responsible for double tones.

Mr. A. J. Brown brought down the prints operated upon by the Zenotype Company last week, he having completed their fixing and washing.

Messrs. L. S. Zachariasen and Frederick J. Abbott were elected members of the Association.

MERCURY-TREATED GELATINO-CHLORIDE PRINTS.

Mr. T. E. Freshwater showed prints sent to him from India, the damp climate of which had spoiled the gelatino-chloride paper, and caused it to tone to a greenish colour. His friend had tried immersion in mercury bichloride, and found that it restored the tone to its usual colour, and desired to know if this treatment was against their permanence.

Mr. W. E. DEBENHAM said that the reactions of silver and mercury were complex, and he could not answer the question off-hand.

Mr. E. J. WALL said that these two metals, in the presence of an alkaline chloride, formed a permanent compound.

Mr. R. P. Drage had treated aristotype paper with mercury bichloride, and found the tones improved.

THE TELE-PHOTO LENS.

Mr. T. R. DALLMEYER being present, was asked to offer some remarks upon optical matters. He expressed himself willing to answer questions to the best of his ability.

He replied to Mr. Parfitt that there was no limit to the size obtainable of the image of the moon with the tele-photo lens, but, practically, the lengthened exposure determined it, as the moon's proper motion would interfere with definition unless the camera was mounted upon an equatorial stand. He remarked, with pleasure, that a recent eclipse expedition had used the tele-photo method instead of secondary magnification, and had obtained better definition. Respecting the magnifying power of this lens, the rule governing the size of image projected of a lantern slide followed the same optical law.

TONING.

Mr. E. J. WALL opened a discussion on toning. Of the three possible states of the bath, acidity gave red tones and slow action; the bath kept well, but had gone out of date. Neutrality gave brown tones, and would not keep so long, whilst alkalinity favoured purple tones, and would keep but a short time. With organic matter, neutral gold chloride formed a stable compound, but not so in an acid state. He concluded by saying that he believed the combined bath was all right provided it was properly used—no alum, no lead, and not acid—with correctly printed and washed prints. A large number of gelatino-chloride prints passed through his hands, and he believed some thirty per cent. of those, as usually treated, would not last twelve months. In adding alum to hypo, the decomposition would not be complete in forty-eight hours, nor, indeed, in three months. When a platinum bath worked slowly, he recommended the addition of some gold chloride, which made it active again.

As an example of toning after fixing, Mr. Wall gave a formula for toning lantern slides to a blue shade; it was distinctly alkaline. The proportion of sulphocyanide to gold could be anything between 4 to 1 and 60 to 1; 30 to 1 might be considered as a mean amount. If more sulphocyanide were used than stated, then the gelatine might be attacked; if less, there would not be a proper combination with the gold.

A vote of thanks to Messrs. Dallmeyer and Wall concluded the meeting.

PHOTOGRAPHIC CLUB.

SEPTEMBER 5,—Mr. E. W. Parfitt in the chair.

The HON. SECRETARY read a letter from the Royal Photographic Society, asking for a show of slides for an evening during the coming Exhibition.

The Hon. Secretary was instructed to write that the Club would give a show.

Mr. COWAN, referring to the question of toning after fixing, which Mr. Henderson had lately "resurrected," said that he had experimented with the results he then showed. The first was fixed only, the second with addition of acid to the sulphocyanide bath, and the third without. He came to the conclusion that if operators ascertained that the bath was neutral, or slightly alkaline, they would not be troubled with double toning. Answering a question as to the surest test for acidity or alkalinity of a solution, he said that he always had by him some phenol phthalein, two drops of which in a pint of solution would instantly detect a trace of either. It was first suggested to him by the late Mr. A. M. Levy.

The HON. SECRETARY reminded members of the annual outing to Hampstead, and it was decided to have same on 29th inst.

Mr. NESBIT asked Mr. Welford his opinion, with regard to pressing the button release of a hand camera, whether he had found a difference between a heavy and light build of camera?

Mr. WELFORD said that it entirely depended upon the shape of shutter and distance it had to travel. He much preferred a pneumatic ball and tube.

The Chairman, Mr. Cowan, Mr. Tottem, and others did not approve of ball and tube, instancing cameras fitted with ball and tube being used by preference without it.

Mr. WALLIS, having instanced a "crack rifle shot" before firing always inflated his lungs and held his breath at the critical moment,

Mr. Troup and Mr. Tottem corroborated from experience, the latter adding that, if the button-release of a camera was released as the trigger of a rifle, *i.e.*, a compensating pressure on opposite side of camera, no movement would be noticed in resulting negatives.

Hackney Photographic Society.—September 4, Mr. R. Beckett presiding.—Mr. L. Fowler Pool was elected a member. Work done by the zenotype process was shown by Messrs. Dean and Roofe. Mr. A. BARKER inquired if any one could recommend a good mountant, always ready for use. Mr. ROOFE recommended Houghton's "Excelsior" mountant. Mr. RODER deprecated the use of fish glue, but Mr. GOSLING said he used it round the edges of the prints only, and found it good for glazed prints. Mr. FARMER recommended "Stickphast" paste. Mr. R. BECKETT preferred gelatine. Use a soft gelatine dissolved in a vessel placed in hot water. The mountant should be rather thin, to obviate Mr. A. Barker's objection that, in the event of the print not being placed accurately on the mount, the gelatine sets so soon that the print could not be shifted without injury. The HON. SECRETARY then informed the members that a change of place of meeting was contemplated, and that circulars would be sent to all, so that it might be discussed and settled at next meeting. Messrs. Loman & Co.'s representative showed and explained their "Reflex" hand camera, which had several ingenious and useful features. The same firm also showed their "Premier" hand camera. The representative of another firm showed and explained the "Vedette" hand camera. This, besides possessing several useful points, can be converted into an enlarging camera. Mr. GOSLING gave particulars of the excursion to Waltham Abbey on the 8th inst.

FORTHCOMING EXHIBITIONS.

1894.	
Sept. 14–Oct. 6	*Royal Aquarium.
,, 17–21	*Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	*Royal Photographic Society of Great Britain. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1	*Stanley Show (Photographic Section).
,, 29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December.....	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
1895.	
March 25–30	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

Correspondence.

CARBON PRINTING.

To the EDITOR.

SIR,—I had not seen the letter in your issue of August 31 when I wrote my second article on *Lantern Slides by the Carbon Process* for last week's supplement; but if your correspondent, "An Amateur Carbon Worker," finds any difficulty in coating his transfer glasses with bichromatised gelatine, he will find the alternative solution I there give equally efficient, and much easier to apply.

The difficulty with gelatine is, of course, the setting and drying; but with the solution of albumen or sugar and bichromate a little may be poured on to the glass, and rubbed well in with a piece of linen rag in order to make it take "kindly" to the glass, and the plate at once dried at the fire. Or if a particularly even coating be desired, the mixture may be rubbed in as already described, and then a fresh quantity poured over the whole surface, and drained off as closely as possible, as the thinnest possible film on the glass suffices to hold the carbon image.

Of the two solutions I prefer the albumen. The white of one egg is stirred—not beaten—into from six to ten ounces of water and a little ammonia added, together with three or four grains of bichromate of potash to each ounce, and the whole carefully filtered. Using the solution as I have described, several dozen glasses may be prepared in the course of an evening, or a single one may be got ready at a moment's notice and dried quickly at the fire.

The almost inappreciable film of matter left on the glass of course requires exposure to light before the transfer is made.—I am, yours, &c.,

September 5, 1894. W. B. BOLTON.

DEVELOPING SOLIO PRINTS.

To the EDITOR.

SIR,—Your article on "The Development of Gelatino-chloride Prints" describes a few trials of tannin and pyro as a developer, and the failures you experienced. Nevertheless I repeat what I wrote in my last, that for *Solio* paper I have found no developer more easily used or more powerful for this purpose.

The *back* of the paper becomes stained, but that is of no moment; the film and front of the prints, in my hands, are *not* discoloured. I inclose two quarter-plate prints, hurriedly made, on solio paper, cut in halves, showing the depth of printing and the results of development. The paper has been in my possession for twelve months, and has slightly deteriorated; but the resulting prints, which were placed after development in the hypo bath without washing, do not show any signs of discolouration on the fronts; the backs are stained.

The prints were developed in the solution of tannin and pyro recommended in my last letter. I do not consider these directions so delightfully vague as you seem to think. Have you never recommended the measurement of dry pyro in a bone spoon when mixing a developer for dry plates in order to save the trouble of repeatedly weighing it? If so, what is there more vague in speaking of "sufficient tannin to stand on a threpenny-bit, dissolved in one ounce of water, with the addition of five minims of a ten per cent. solution of pyro, acidified with nitric acid?"

The amount of nitric acid (used as a preservative) added to the ten per cent. pyro solution when first made up was twenty minims. Nothing extraordinary about that, I'm sure. Will it also be necessary to say that a threepenny-bit is *not* absolutely necessary for the measurement of tannin?—a half-a-crown will do just as well so long as the amount of tannin is not excessively increased beyond what the smaller coin will hold.

The advantages of this process over alkaline development after conversion of the chloride into bromide and the subsequent washing are simplicity and saving of time. There is also not so much danger of overdoing the development with tannin and pyro as with alkaline development; as with the first it is necessary to carry development to a depth beyond the finished result, but with alkaline development the print must be stopped at a certain indefinite point, when the detail is out and the shadows are only faint, as the toning acts as intensification.

Tannin alone will develop without staining if the printing has been carried to about half the required depth. Pyro is added as an accelerator when the printing is much underdone.

Acid pyro alone develops up the image, but with flat, poor results.

If a slight yellowing of the whites appears in developing it disappears in the fixing bath. If Ilford P.O.P. is used, the film is stained badly.

Finally, I should like to hear the opinions of any of your readers who have tried this method of developing *solio* paper.—I am, yours, &c.,

Stroud, Gloucestershire, September 8, 1894. W. RIDLER.

LEAD FORMATE AND QUINOL.

To the EDITOR.

SIR,—Rather more than two years ago (*Photographic News*, 1892, p. 252) a formula was given for quinol, sodic carbonate and lead *acetate*. It was described as suitable for greatly over-exposed plates. On mixing, a very dense precipitate of, I presume, lead carbonate was thrown down, a proportionate amount of soda being converted into sodic acetate. I did not try this with quinol, but with pyro I found it gave very excellent results, the exposure not requiring to be excessive. I gave it up owing to the extreme difficulty of filtering out the deposit. It broke through filter paper, and clogged up cotton-wool, and had to be filtered two or three times. I ascertained that the clear solution showed no trace of lead, so that it seems likely that sodic acetate would answer as well. It would be interesting to know whether the formate acts in the same way, and whether the precipitate in this case is more easily got rid of. Lead formate is not quoted in photographic lists.—I am, yours, &c.,

September 8, 1894. CLIFFORD E. F. NASH.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITOR.

SIR,—Will you kindly give publicity, in your next issue, to the inclosed report, from the local press, of a case recently decided, of great importance to professional photography? Mr. H. Dunning, of Usk, Mon., is a valued member of our Association, and has been with us from the founding of the Association. It was a subject of great regret to the President and Council that we were not able to take this case up and fight it for Mr. Dunning. It was just an instance which illustrated forcibly one of the numerous advantages which would accrue to the profession if this Association were supported as it deserves to be.

Mr. Dunning is to be congratulated on winning his case; and, on the important declaration made by the judge, that "the negative is the property of the photographer, unless a special agreement is made to the contrary."

Mr. Dunning emphatically denied in Court that he had, in any way, "published," or even offered for sale, a single copy of the negatives in question. Of course the "counter-claim" will never be heard of further, in face of such a decision.—I am, yours, &c.,

D. J. O'NEILL, *Secretary*,
National Association of Professional Photographers.

47, *Charlotte-road, Birmingham, September* 5, 1894.

P.S.—If "Rudder Grange," or any other of your correspondents in the recent "Call to Arms," will favour me with their names and addresses, I shall be happy to communicate with them.

[ABERGAVENNY COUNTY COURT, BEFORE HIS HONOUR JUDGE OWEN.—"NEW CAUSES.

"Henry Dunning *v.* Arthur Herbert.—The plaintiff in this case is a photographer living at Usk, and was represented by Mr. James Corner, instructed by Messrs. Watkins, of Pontypool. The defendant was represented by Mr. Fred Gardner, who said that his client was at the Embassy at Brussels, and was unable to leave there as the Ambassador was away. He had given the plaintiffs notice that he should apply for an adjournment.

"Mr. Corner said that as far as he could see there was no defence to the action.

"Mr. Gardner: The action is, amongst other things, for going to two houses and taking certain photographs. We say that the arrangement was that the negatives were to be the property of my client, Mr. Herbert.

"Mr. Corner read some correspondence in which it appeared that a cheque for 18*l.* 8*s.* 6*d.* was sent to the plaintiff by the defendant after the summons was issued, but the solicitors for the plaintiff had incurred the plaint fee previous to receiving that cheque, and the cheque was returned. In the correspondence the plaintiff's solicitors denied the defendant's right to the nega-

tives, but admitted that he had given an undertaking not to sell copies, and that so far he had complied with that undertaking.

"His Honour: My view of the law is that the negative is the property of the photographer unless a special agreement is made. The photographer has no right to publish the photographs without the permission of the person whose place is taken.

"A counter-claim had been filed for damages for publishing the photographs.

"His Honour said that that might be a ground for injunction.

"Mr. Corner contended that the plaintiff ought not to be kept out of his money.

"Mr. Dunning was then called, and proved his claim for 18*l.* 8*s.* 6*d.*

"His Honour gave judgment for the plaintiff, with liberty for the defendant to bring an action upon the counter-claim."

HACKNEY PHOTOGRAPHIC SOCIETY'S FORTHCOMING EXHIBITION.

To the EDITOR.

SIR,—For the delay in issuing prospectus of the Exhibition in November next we must apologise to the numerous gentlemen who have written for forms, but we hope to have them ready next week.

The open classes will be:—1. *General work:* award, 2 silver medals, 1 bronze. 2. *Portraiture and genre:* award, 1 silver medal, 1 bronze (in this class firms can compete as such, the work not necessarily requiring to be that of one man only). 3. *Champion*, for medalled pictures: award, 1 gold medal, 1 silver. 4. *Lantern slides:* award, 1 silver medal, 1 bronze. In addition to the above awards it is proposed to grant certificates. The judges who have kindly consented to act are Messrs. E. J. Wall, Valentine Blanchard, and Ralph W. Robinson.—I am, yours, &c.,

September 8, 1894. W. F. FENTON-JONES, *Hon. Sec.*

THE REJECTED.

To the EDITOR.

SIR,—The proposed Exhibition at the Central Club of the rejected pictures from the two coming Exhibitions would be one of the most interesting shows of the year if it could be fully carried out, but how more than a small percentage of the rejected from either Exhibition is to be collected is a puzzle difficult of solution. In the first place, how is the executive of the Club to reach all the unfortunate producers of rejected photographs? It would be anything but desirable—indeed, it would be dishonourable—for the Secretaries of either Exhibition to disclose the names and addresses of those who had failed. I myself intend to send both to the Salon and the Pall Mall, but if I thought that, in the event of rejection, my misfortune would be proclaimed by another society to all the world, I should certainly not contribute.

Another strong objection which will have weight with many is that, in their circular letter, the Secretaries of the Club call the prospective rejected *photograms*. I need not tell you, sir, that there are many who think this an opprobrious name for a work of art, or have a sentimental objection, which should be respected, to having their photographs called photograms. One consideration, however, would possibly justify the use of the obnoxious appellation. There is a certain feeling of belittlement in the word, so possibly there would be a certain sense of fitness in calling the rejected *photograms;* but surely it would not be courteous.

Some of your contemporaries seem to think there will be revelations among the rejected. For instance, one supposes it will discover what is not to the taste of the Salon Hanging Committee; forgetting that last year a large number of pictures, highly approved by the Committee, were declined, not for want of merit, but for want of space.—I am, yours, &c., SIABOD.

P.S.—Since writing the above, I find that the word *photogram* has been withdrawn, and *photograph* substituted. A wise retrocession.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

Debenham & Co., York.—*Portrait of Canon Machell.*

William Henry Fischer, Manchester.—*Portrait of Mr. C. Malcolm Wood.*

Edmund Eccles, Bury.—*Group of the Bury Association Football Players.*

George Dixon Scorah, Fleetwood.—*Photograph of Drawing entitled "Mother-in-Law."*

ALPHA.—The correct address is that given in our ALMANAC (page 221) as Charles Burr, optician, Wakefield-street, East Ham, London.

J. J.—The firm ceased to exist some years ago. Gwynne & Co., Brook-street, Holborn, supply a special plant for portraiture by electric light.

J. H. COATH.—It is the opinion of several expert photographers that the example sent is a case of double exposure, but how produced it is difficult to decide.

T. C. (Widnes).—The mounts may be at fault, but we see no evidence of it. Certainly, some of the stains on the prints are clearly due to faulty manipulation.

B. F. J. B.—A provisional protection only was obtained for the invention Hence you are quite at liberty to manufacture the article in question.

YELLOW.—The paper named is an excellent one. From the appearance of the print sent we should be inclined to think that your manipulations are at fault in some way or another. Do you use the combined or separate baths?

C. WALTHEW.—The markings round the two edges of the negatives sent are what are known as drying marks. That is, the plate, after it was coated with the emulsion, dried unevenly. The reason why the marks show only on two edges is that the quarter-plate was evidently cut from a whole plate.

R. B. T.—When paraffin is recommended for the coating of the inside of wooden vessels for photographic purposes it is, of course, not paraffin oil, but solid paraffin—paraffin wax. It may be had from most oil shops in the neighbourhood of Clerkenwell, and in a purer form from such houses as Hopkins & Williams.

H. W. B.—1. A suitable dead black varnish for the inside of lens mounts may be made by mixing "vegetable black" with common lacquer. If too little black is added, it dries glossy. 2. Try sandarac, one ounce; alcohol, six ounces; and castor oil, about eighty grains. This forms a good varnish, on which retouching can easily be done.

A. BELLETTI.—On the whole, the Smee form of battery is, perhaps, the best, certainly the most convenient to use for depositing copper on hardened gelatine; but electrical matters scarcely come within our province. We should recommend you to get some one or other of the elementary works on Electro-deposition. There are several published, any one of which will serve your purpose.

SHYLOX.—We strongly suspect that your difficulty in getting the films to strip from the waxed glass plates is due to the wax used. White wax is rarely pure, and unsophisticated wax is necessary. Get some common yellow beeswax from some farmhouse where bees are kept, and the older it is the better. Why not use French chalk, it is far easier of application and the surface it yields is nearly, if not equal, to that given by wax?

T. SOMES.—If a wide-angle lens of five-inches focus, used on a whole-plate, will not include the whole of the subject desired, and the camera cannot be taken farther away, we fear that there is no way out of the difficulty, except by taking two negatives and combining them, either in the printing or in the mounting afterwards. A lens of less equivalent focus than that named cannot be expected to cover the whole-plate to the corners, even when a very small stop is used.

S. HERTZ says: "I want to obtain a hard, and very insoluble, film of gelatine. I have tried chrome alum in varying proportions up to the point when it coagulated the solution, and it does not make it sufficiently hard when it is afterwards wetted with water. Can you assist me? If so, I shall be much indebted."—The most insoluble film of gelatine we know of is obtained by the addition of either of the bichromates of potash, ammonia, or soda, and subsequent exposure to light.

W. C. W.—Retaining the specimen, under the circumstances detailed, is nothing short of a fraud. We have never heard of the so-called "firm" or its grand title. Write to the Superintendent of Police of the district without delay. You might also proceed against the firm, whoever they may be, for using the Royal Arms and "by appointment to the Queen," as we know it cannot hold a royal warrant, for penalties, if you care to go to the trouble. On the whole, perhaps you will do well to get your pictures back and rest content.

A. M. Z. says: "I wish to try the metol and hydroquinone developer, the formula of which you published two or three weeks back in the BRITISH JOURNAL OF PHOTOGRAPHY. The stock solution contains, I see, metol, four grains to the ounce. Am I right in supposing that in case 1 (over-exposure) the stock solution should be diluted to metol, one grain per ounce, and bromide added? 2. Too brilliant a view, such as whitewashed cottage and dark ivy, with a tendency to give hard negative. Developer made up to metol two grains to the ounce, bromide omitted. 3. Under-exposure dilute stock solution to one grain metol per ounce, omit bromide. 4. Too flat a view, metol, one grain per ounce and bromide. 5. I see you say developer (stock solution) should be diluted according to circumstances with from one to three volumes of water; this gives strength of from two grains to one grain of metol per ounce of developer. Is it ever advisable to use it with more than the former or less than the latter amount?"—In reply: 1. Dilute the stock solution so that it contains two grains of metol to the ounce, and add bromide freely as required. 2. To counteract the tendency to hardness, simply dilute the stock solution without any addition of bromide. 3. For under-exposure the same treatment *and* patience. 4. Strong developer and bromide as required. 5. The limits mentioned may be exceeded if it be found necessary, but such will rarely be the case. Generally stated, where density and contrast are required, a strong developer and plenty of bromide should be used, and *vice versâ*.

*** Several answers, &c., held over.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1794. Vol. XLI.—SEPTEMBER 21, 1894.

FIXED ALKALIES IN USE.

Since writing last week on the subject of *Fixed Alkalies* we have extended our tests to the hydrates of potassium and sodium, but without finding any such wide divergence from theoretical values as we had to record in connexion with the carbonates. This is in part, no doubt, due to the fact that the samples tested were newly obtained from a good source, and therefore had not been subjected to any of the conditions that would lead readily to deterioration; but probably also it may be that the hydrates are not, strange as it may seem, so prone to change as are the carbonates.

An old sample of sodium hydrate that has been in our possession for over ten years justifies us in making this suggestion. It has had no special care devoted to it, but forms the remnant of an original two-pound bottle, some four ounces of which still remain. It has stood on the ordinary laboratory shelf in a wide-mouth stoppered bottle without any luting, indeed the stopper had become so firmly fixed in by the action of the soda that the bottle had to be broken in order to get at the contents, as mentioned last week. Under these circumstances it might be imagined that little change ought to take place, although we found on trial that it was about twenty-seven per cent. below its theoretical value. On testing, however, a perfectly new sample in precisely the same manner, we found a difference of over fifteen per cent. from the proper value, so that we may set it down that sodium hydrate, at any rate, is not liable to any very rapid change if kept under ordinarily careful circumstances.

Potassium hydrate is, no doubt, more liable to change on account of its more hygroscopic character, its deliquescent nature rendering it more liable to pass into the state of carbonate; but, at any rate, this and the corresponding sodium base are obtainable in a more definite and reliable condition than their carbonates, and, if properly stored, will remain in practically the same condition for a reasonable period.

The object of the present article is to give an account of the actual behaviour of the samples of carbonate of potassium and sodium, mentioned in our article of last week, when put to the test of development; and the result of our experiments tends rather to show that there is scarcely so much danger to be anticipated from variations in their value as might be anticipated, or as we have already suggested. In other words, the "latitude" in development is so great—at least with the more modern reducing agents—that the quantity of alkali used seems to be of no further importance than that it prolongs or reduces the time occupied in bringing out the image, and in working it up to printing density.

It is quite possible, and indeed probable, that the same remarks apply to ammonia to a modified extent if used with the newer developing agents, but our experiments have not, so far, extended to the use of ammonia. The volatile nature of ammonia prevents any accurate test of what may be termed "its staying powers," but it is most probable that variations in its strength have little more effect on development than—as in the case of the carbonate—to hasten or retard the final result.

For the purpose of our experiments, we prepared a solution of metol, hydroquinone, and sulphite of soda, in the proportions given in a formula two or three weeks ago, and to separate quantities of this solution the different samples of alkali were added in precisely equal proportion, quite regardless of their state of hydration. This may seem, and indeed is, a pretty stiff test; but, as the result proved, the variation in results scarcely went beyond an alteration in the time occupied in the process of development. It would be wrong to say that absolute identity of image was obtained in every case, for such was not so, but the variations in density were as much in favour of the strong as the weak alkali in different experiments, the real difference being perhaps due to longer or shorter time.

The samples of alkali tested were those mentioned in our article of last week, namely carbonate of potash as obtained from the chemist and after drying; carbonate of soda in the form of "washing soda" in its normal state, after desiccation, also after free exposure to the atmosphere for four or five days; and finally pure crystallised carbonate of soda. These were added to the standard solution of metol-quinone in the proportion of—

Carbonate of potash	10 grains,
Carbonate of soda	30 ,,

to each ounce.

No attempt was made to secure absolute identity of exposure, except in one instance, where a plate was cut in two and developed with two solutions offering the widest divergence in strength. The exposures were made in the ordinary way—as if for ordinary development with the same solution—and were submitted to the action of the different mixtures already mentioned, and the results scarcely varied from one another any more than would have been the case if the same solution had

been employed throughout, except in the time occupied in the development. Two separate series of trials were made, one without bromide, the other with one grain of potassium bromide to each ounce.

With the two samples of carbonate of potash there was literally no difference in the final image, and comparatively little in the time occupied in development. Of several exposures made, with approximately equal timing, it was impossible to say whether the dry or the hydrated salt gave the greater density or the fuller detail—in fact, but for a slightly quicker action on the part of the dry salt, there was practically no difference.

With the carbonate of soda, the dried salt brought out the image much more rapidly, especially without bromide, and worked up density also in a shorter time; but the untreated washing soda, as well as the pure crystals, gave as much density and as much detail when allowed sufficient time for action. In fact, as a supreme test, the cut plate already mentioned was developed, one half with pure crystals—deca-hydrated—the other with dried washing soda, and presumably mono-hydrated, each half being so treated as to get out all the exposure would give, regardless of the time occupied. The result was, so far as detail and gradation were concerned, apparently equal action, but a little more general density in the case of the dried salt.

We must admit a certain amount of surprise at the result of these experiments, though at the same time some satisfaction in the feeling that we are not quite so much at the mercy of our chemicals as we had imagined.

AUXILIARY EXPOSURE.

The diminution in the actinic quality of the light during the last few weeks reminds one that a greater is to follow, and that "snap-shottists" will soon be heavily handicapped. Hence any means by which exposure can be curtailed, or, what comes to the same thing, a minimum action of the light can be augmented, will be a considerable gain during the coming season; for, sensitive as gelatine plates can be made, they are often not quick enough, under some conditions of light and the rapid exposure that is sometimes necessary in taking moving objects, to secure a fully exposed negative. If this end can be attained, even to a limited extent, it will manifestly be a considerable gain.

These considerations bring us to the old and vexed question of auxiliary, or, as it is sometimes termed, supplementary exposure. In saying that the question is an old one as well as a vexed one, it may be mentioned that it was much discussed in the Daguerreotype days. In the wet-collodion time it was frequently argued *pro* and *con.*, and it crops up every now and again in connexion with the present dry plates. After all these years, the question at issue remains pretty much where it did at first. Some maintain that the only effect obtainable is a slight fogging or veiling of the plate, and thus a more harmonious negative is produced than would otherwise be the case. On the other hand, not a few affirm that more actual detail is secured, and that without any trace of fog, provided the action is not carried too far.

More than twenty years ago (see our volume for 1872) we witnessed a series of experiments with wet collodion that proved conclusively, to us, that additional detail could be obtained by supplementary lighting, and that, too, without a trace of fog, unless, indeed, the action was overdone. At about the time to which we refer there was considerable controversy as to how the supplementary lighting should be carried out. It was thought by some that it should be through a coloured medium, and some advocated one colour and others another. But the experiments referred to convinced us that the colour was immaterial and that a brief exposure to white light brought about the same result. The only advantage that coloured light seemed to possess was that the supplementary exposure could be more accurately gauged than it could be with white light, owing to the latter's greater activity.

With gelatine plates the same difference of opinion obtains as to the value of auxiliary lighting as has always existed in other processes. Some say that only a veiling is produced, others that additional detail is obtainable. It is quite customary with experienced hands, when they find they have a much under-exposed negative developing, to give it a slight exposure to light, and by this means they often secure a better result than would otherwise be the case. It is not our intention here to discuss whether more detail is actually obtained or not, for it matters very little in practice so long as a better *tout-ensemble* is ultimately secured. Of course, no one would for a moment suggest under-exposure with the idea of compensating for it by any after-treatment. Supplementary exposure should only be resorted to in extreme cases, when other means fail.

It has just been said that there exists with dry-plate workers, as in former times with older processes, contrary opinions as to the effect of the secondary lighting, and it may be that there are very valid grounds for them. For example, A may try the method and find it advantageous, while B, in trying it, may obtain only a decided fog even with the faintest possible supplementary lighting. This may often be accounted for by the latter's plates having already received the maximum of auxiliary lighting they will stand; for, as our early investigations on the subject proved, it matters not whether it is done before or after the camera exposure, or during the development. In examining the plates at the manufactory, or in packing them, they may receive a certain, though infinitesimal, supplementary lighting. In placing the plates in the slides, or changing them, they may receive a little more, for the light in many dark rooms would assuredly fog a very sensitive plate if long submitted to it. Not a few of the cheaper forms of cameras, particularly the bellows of them, are not absolutely light-proof under all conditions. Again, the insides of many cameras reflect sufficient light to, in itself, produce the maximum "supplementary light" the plate will bear without actually fogging it. Now, if such plates were further treated to secondary lighting, fog would be the inevitable result.

Twenty or more years ago, when this subject was on the *tapis*, we remember a correspondent writing to the effect that when he added a new dark room to his establishment he found that a much longer exposure—twenty to thirty per cent.—was needed on plates (wet) that were manipulated in it than with those prepared and developed in the old room. At our suggestion an extra thickness of orange calico was put on the window of the latter, and it was found to make the two rooms equal. We mention this simply to show that discrepancies with different workers may be due to actually employing this so-called "auxiliary lighting" to the maximum extent without being aware of the fact, and consequently anything more would assuredly produce fog.

A Last Outing.—On Saturday, September 29, following a custom now established for several years, the Photographic Club will wind up the season with an outing to Hampstead, and will be joined by the London and Provincial Photographic Association. Hitherto these outings have been very successful, and we do not doubt that on this occasion a pleasant gathering will result. Although so near London, Hampstead is an ideal place for camera work.

Fluorescence.—This property of certain salts, so closely connected with isochromatic photography, receives an important examination by Mr. E. Buckingham in a paper published in a foreign chemical journal. The well-known irregular photographic action of quinine, when applied to a surface to be photographed, being since shown to be owing to the particular acid employed in aiding its solution, is now easily explainable in the light of this chemist's experiments. He states that the bivalent quinine sulphate is more strongly fluorescent than the univalent citrate. The effect of alkalies on quinine salts is to diminish the effect, while acids and neutral salts increase it—results to be anticipated in accordance with theory. With eosine, the foundation of modern orthochromatic plates, dilution increased the fluorescence; the addition of strong acids and neutral salts, if in sufficient quantity, caused a diminution, as also did strong alkalies.

The Price of Aluminium.—The greatly increased cost of aluminium-mounted lenses over those of brass is usually considered to be owing to the increased value of the metal, but this not the true explanation, which is really to be found in the difficulty and cost of working the material. Up to the present time no entirely satisfactory simple method of soldering this metal is known, though numberless methods have been put into circulation or sold as trade secrets. At Neuhausen, where it is made at the rate of about three tons per diem by the electrical process, it is estimated, upon a basis of the horse power required to produce it (fifty to sixty horse power per kilogramme), that one shilling and sixpence per pound will probably be the minimum possible price. Even putting it at half-a-crown to cover dealers' profits and so forth, it will be seen from this that the actual value of the raw material in a lens mount is a question of a few coppers only, while the increase in cost is more than as many shillings as the pence value of the metal. If, then, we are to have aluminium-mounted lenses at a price little exceeding those of brass, it is evident that we must devise, not a cheaper method of producing the metal, but an easier mode of *working* it.

An Old Sample of Sel d'Or.—We have lately had an opportunity of examining a sample of sel d'or of unknown age, but certainly not less than thirty-seven years. It was of Forder & Gelis' make, and was contained in a small stoppered bottle with the original seal unbroken. It will interest our readers to be informed that, so far as visual appearances could indicate, the salt was in as perfect a condition as when it first left the makers' hands, perfectly white and well-formed crystals. The fact, however, of this chemical itself, the double hyposulphite of gold and soda as it was formerly termed, being unchanged is no criterion of the permanency of its effect to be anticipated after employing it as a toning agent. Indeed, at the time its purpose was very popular the great fault alleged against it was, first, the fugacity of the pictures; and, second, the yellowness of the whites. Turning to an old volume of the *Photographic Notes* of our late esteemed collaborateur, Mr. Thos. Sutton, we find numerous complaints to that effect made public in his columns. It is worthy of note that Mr. Sutton, while admitting the existence of this latter defect, stated that, as indicated by his frequently repeated experiments, a complete remedy against yellowing was found in washing the prints in salt and water before toning and before fixing. It is amusing to note, too, that the practices of the sophistication of gold salts, so much heard of a year or two ago, were in vogue nearly forty years since, one correspondent complaining that he had analysed a sample he had purchased and found it to contain only eight per cent of gold.

The Relative Affinities of Certain Acids.—An abstract of a paper by Mr. Cary Lea, the original of which appears in the *American Journal of Science*, is given in the September issue of the *Journal of the Chemical Society*. He shows how erroneous are many of the conceptions regarding the relative affinities of well-known acids. It has often been the custom to explain, when in photographic practice two salts are mixed, how the acids change places in a solution, though no precipitation takes place. Mr. Lea gives data showing that the exchange of acids is often different from what is commonly supposed, and one of his observations throws light upon the anomalous action that apparently takes place at times when sulphuric acid is added to sulphite of soda solution to make the acid fixing bath. He points out how, to obtain true comparative results with his methods of mixing salts and sulphuric acid, it is necessary to use acid always of the same strength, and to add the salt to it. As an example, he shows that, when four c.c. of normal sulphuric acid are added to forty c.c. of normal sodium nitrate, not a trace of free sulphuric acid can be found in the solution; but, when the same quantity of acid is used in a solution of one-tenth the strength, the result is quite different, and an abundance of free sulphuric acid is found in the solution. No doubt the same effect will occur in the case we instance of sulphite; hence, to obtain a uniform mixture of neutral and acid sulphite by the method of adding sulphuric acid, that acid should always be employed of the same strength, preferably strong rather than weak.

JOTTINGS.

THE announcement that Dr. Bertillon's method of anthropometrical measurements has been adopted by the Police authorities for the identification of criminals means, I suppose, that photography, which has hitherto been employed for that purpose, will forthwith be wholly or partially abandoned. I know very little of the extent to which photography is made use of by the Police, and how far it has failed in their hands, but it has always struck me that, although on theoretical grounds nothing could be so scientifically accurate and reliable as the image formed by the unemotional lens, the field of possible error was a wide one. I am not going to point out how, despite the ignorant belief to the contrary, photography can be made to lie, although it will be apparent that this must be admitted as a factor in the case. Not only by lenticular agency, but by other means, photographic portraiture is easily falsified, and, doubtless, far more frequently by inadvertence than by design. It is therefore easy to see that in cases of criminal identification by photography the door is opened very wide for doubt and deceptiveness.

I am thinking of quite another agency, which may operate to entirely vitiate the fidelity and reliability of the photographic records secured by the Police photographer. I mean the person photographed. The sitter, if he be a criminal, with all a criminal's artifice and command of histrionics (your habitual criminal is by nature a masterful actor), holds the key to the situation. Let the photographer be never so clever, his lens and plate never so well adapted for the purpose in view, the enormous power which the sitter has over the control of the muscles and the expression of the face is such that, given the inclination, nothing short of a miracle can prevent him imparting to the negative such a degree of mobility that the resulting print shall bear little or no critical resemblance to the face of the original, comparatively considered. I do not know whether this aspect of the matter has ever cropped up in actual experience, but I think it of sufficient importance to warrant attention being drawn to it as a possible factor in casting discredit on the value of photography as a scientific aid in the identification of criminals.

Under the Bertillon system all this, as well as the possibilities of error in other directions, is to be changed. The metre measure is to be substituted for the image-forming objective. Criminals will have "the rule run over them" in various parts of the body which are not liable to undergo alteration; the figures will be docketed for

reference, and—*voilà tout*. By this means the certainty of identification will, I suppose, be assured, and the possibility of mistakes reduced to a minimum. I am curious to know how the plan is expected to work out in the case of twins, and also whether the system does not offer opportunities for the introduction of flagrant errors. I read the other day that a man had a new nose formed out of one of his fingers fitted to his face. Assuming the Bertillon system took cognisance of nose or no nose, how would this and other difficulties that will suggest themselves to the reflective reader be got over? Finally, what about that old foe to scientific exactitude, the personal equation—always a most vital consideration in police questions?

I am fated to be police-y this month. Ugh! May my intercourse with the force never be so intimate as to necessitate my being photographed or anthropometricalised by them. Eh? Thank you, my dear sir. Yes, possibly I *ought* to be; but—*et tu, Brute?* Then, fall "Cosmos." But a truce to frivolling. The other day I saw a paragraph in which it was stated that a Hastings magistrate had delivered himself of sundry observations of photographic interest. Remarking on the number of drunken people brought to him, he said that the police should be enabled to photograph them in that unfortunate state, so that they might, when restored to their proper condition, see how they looked under the influence of too-potent liquids. As a piece of moral philosophy, I have nothing but praise for his Worship's recommendation. No better object-lesson in the evils of intemperance could be selected than allowing Philip to study his sober and unsober presentments side by side.

Nevertheless, this interesting method of enabling us to see ourselves as others (and the lens) see us, when we are *not* ourselves, is surrounded by difficulties of a practical nature, which perhaps his Worship of Hastings has not taken into consideration. For example, are we to suppose that all members of the force are to be armed with hand (or "detective") cameras when on their beats? Again, would a snap-shot of an individual with an inane grin on his face be taken as evidence of intoxication? If so, you and I, reader, can count off scores of people who, while being absolutely innocent of alcohol, must, like Mr. Pecksniff, be set down as "chronically" intoxicated. And, then, how would the police snap-shotist get on at night-time when, and not in the daytime, the majority of the public worshippers of Bacchus are seen in the thoroughfares? Would he carry a flash lamp? Or, would each police station have a photographic installation for use by night as well as day? There is evidently a strong Puritan spirit abroad, especially among the occupants of the magisterial bench. If the police are ever converted into photographic spies, I hope that the Lord Chancellor will also order a phonograph to be placed in every court of law and justice, so that the idiotical remarks of those who preside over them may be preserved for the delectation of those who live in the thirtieth century.

Reading through the lines of all that has been written of the Aquarium Exhibition, it is not difficult to forecast that, whatever measure of success it is destined to have will arise out of the eleventh-hour inclusion of a great many of the loan exhibits, notably the Photo-mechanical Section from the Falmouth Exhibition. The optical part seems to have resulted in a severe and unmistakable fizzle, a fact which even the Aquarium authorities appear to have recognised, for in their advertisements, instead of calling the Exhibition an "Optical and Photographic" one, they reverse the order, and say "Photographic and Optical." The trade does not seem to have been large supporters of the affair, at which I am not surprised. If the Aquarium authorities contemplate repeating the experiment next year, I will give them a hint that may be useful. Let them not place themselves in the hands of the insignificant and remote fringe of photographic journalism, but appeal direct to the photographic trade and public. If that policy fails, no other is likely to succeed.

How is it, all things being equal, that some unexposed plates retain their original good qualities for years, while others in a much shorter time deteriorate, and on development exhibit the disagreeable phenomenon of general fog? I ask the question, not for the purpose of attempting to answer it, for indeed I cannot, but rather for creating an opportunity of giving one explanation of the cause which I heard advanced some time ago, but which I have never seen in print. It is this: Decomposition of the gelatine, induced by living organisms contained in it—microbes, bacilli, what you will—which, as is their wont, multiply at a truly alarming rate, and in some way or another react on the silver haloid to fog it. Possibly the hint may induce some of our microscopic friends to submit some fog-giving films to examination with the view of ascertaining whether there is anything in the theory. I mention it here simply as a curiosity and nothing more.

The idea of an Exhibition of the works rejected by the Royal Photographic Society's and Salon's Exhibitions is one well calculated to tickle the "groundlings," but what other purpose it is likely to serve I cannot see. Besides other considerations, it is eminently probable that exigencies of space, and size and shape of picture may largely dictate rejection, and that therefore quite as good pictures are thrown out as are left in; indeed, I should be surprised if this were not the case. Hanging is no certificate of merit, any more than rejection is to be blindly accepted as a bar sinister. It is a mere case of the opinion of a few individuals plus expediency. Where, then, is the *raison-d'être* of an Exhibition of "rejected" works? If I had a photograph rejected at either the Exhibitions named, and I knew that new hanging committees would be appointed next year, I should keep it till then, and send it in again with a tolerable degree of confidence that it would be accepted, and this no matter how poor it was, as witness the cases of several works that were hung last year. A "rejected" Exhibition would simply be a collection of works that had failed to please some half-dozen by no means infallible gentlemen. *Tot homines*, &c.; so, why hold such an Exhibition?

Zenotype, according to all published accounts of it, is a remarkable method of simultaneous development and toning of gelatino-chloride prints. If all that is said about it is true, the inventor may claim to have taken advantage of several principles of photographic chemistry hitherto undreamed of. The particular point that bothers me in this connexion is the implied power of the zenotype-produced image to withstand the destructive action of a mixture of potassium ferridcyanide and hypo. Have any of my readers experimentally confirmed this extraordinary property?

COSMOS.

VIGNETTING.

YOUR leading article of a fortnight ago, on *Faulty Vignetting and its Remedy*, calls attention to an undoubtedly widespread fault, but I am afraid the suggested remedy is beyond the reach of the great majority of photographers who, if not careful or skilful enough to vignette properly in the ordinary way, would scarcely rise to the task of producing the gradation on the negative itself. Indeed, those who cannot, or will not, secure a passably soft vignette with the simple cardboard mask, as ordinarily employed, are not likely to take trouble enough to do it by any method short of the purely automatic, or until perfect vignetting glasses are an article of commerce.

In moderately careful hands the vignetting mask of cardboard, or other opaque material, especially if used in conjunction with the swinging or rotating table so frequently described, is capable of giving the most delicate and perfect results, but it undoubtedly requires to be used with care and intelligence. Besides this, the interposition of tissue paper or ground-glass screens, and the necessity for printing in a very weak light, help to render the process a slow one, and so bring even the most defective vignette glasses into a position of favour they would never otherwise occupy.

In principle there is no fault whatever to be found with the vignette glass, but the very nature of its manufacture renders it almost an impossibility to secure either evenness or softness of gradation; but by the exercise of a little care and patience it is possible to prepare the most perfectly graduated and shaded glasses at a very

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small cost, that may be used in full sunshine if desired, and give no more trouble in printing than when the negative is printed full out.

I have for many years used vignetting masks made of ordinary albumenised paper mechanically graduated by exposure to light on the ordinary rotating table, and so far as the result is concerned nothing could be much better. But, even when waxed or oiled and rendered as translucent as possible, the paper masks very materially interfere with the printing, and it is only with thin negatives and in a good light that they can be used with any satisfaction. Instead of paper, I have tried gelatine plates as well as collodion films, but by no method of development that I have been able to apply can I get sufficient softness of gradation; the shading is always harsh and abrupt, and the passage from clear glass to printing opacity altogether too short.

Collodio-chloride on glass printed out in the same manner as albumenised paper gives very fine results, and offers the additional advantage of pencilling the film to be stripped from the glass. Gelatino-chloride printing-out plates also lend themselves admirably to the purpose of rendering soft gradation; and last, and perhaps in many ways best, we have carbon tissue. For exquisite softness no method that I have tried approaches the last-named, though, where an extremely dense screen is required, some of the other processes named will be found to answer better, particularly gelatino-chloride.

But density I would point out is in itself inimical to softness and delicacy of gradation, at least such has been always my experience, for, if the edges of the screen are sufficiently opaque to entirely stop the passage of light, the shading will invariably be abrupt. The greatest softness is always obtained by means of a screen that is thin enough in its densest part to allow the picture to print through, and the vignette produced by its means is to my mind superior to any other. The lower portion of the figure is gradually shaded off to the edge of the picture, instead of stopping abruptly, while the combined thickness of the negative and of the screen itself suffice to preserve the background in a state of purity. In fact, an opaque vignetting screen is not only not a necessity, but it is a mistake, for the reason I have given, that it militates against softness.

If it be desired to secure a perfectly white margin all round the bust, then, instead of using a single vignetting mask with opaque edges, it will be found infinitely better to use two of different-sized openings, and each individually rather thin. By this means one gradation merges gradually into the other, and the combined strength of the two masks suffices to keep the edge of the picture clear.

The method by which the masks are made is simple enough in practice; but it will surprise many, on trying it for the first time, how difficult it is to obtain perfect results, although on paper everything looks so straightforward. Briefly stated, the process I adopt is as follows:—A specially constructed printing frame has a rebate cut in the front at a distance of half an inch or more, according to the degree of softness desired, from the printing plane. Into this rebate fits a glass plate, in the centre of which is pasted an oval or other shaped mask of opaque paper. I keep a set of these mounted masks of different sizes, each of which I know by its own number, and by this means I am able to prepare vignette glasses of any size to suit any kind of figure or subject.

The sensitive film is placed in the printing frame in the ordinary way, and, with mask in position in front, the whole is set upon the rotating table, and exposed to light, until a sufficient degree of density is secured. Nothing could well be simpler and more straightforward, apparently, but, when put into practice, it is surprising how many trivial things conspire to interfere with the perfection of results. It is needless to say that the softness of gradation is mainly dependent upon the distance between the mask and the sensitive surface; but it is also very materially affected by the position of the rotating table when in use. If the latter hang out in the open with an unobstructed light from all directions, the gradation will be altogether different from what it will be if the light is principally from one side; while, if the illumination be chiefly from the top—from a skylight, for instance—it can scarcely be called gradation at all.

Then, again, if the table does not swing perfectly horizontal, the gradation will be correspondingly uneven, or softer on one side than the other; in fact, in practice, I repeat, it requires the utmost care to secure perfection of result.

W. B. Bolton.

AMERICAN NOTES AND NEWS.

Americans in Europe.—The numerous American friends who visited Europe this summer have, in most instances, returned to their homes. In New York, for instance, where most of the respectable (so-called) churches have been closed during the summer months, owing to the heat that prevails, and the consequent exodus to the seaside resorts by the inhabitants, the Indian summer, with its genial temperature, is understood to be on tap on September 1, when business of every kind is resumed, and churches and schools once more opened. The visits to our editorial sanctum of such commercial powers in the Western land as Colonel V. Wilcox (the head of the old firm of E. & H. T. Anthony & Co.) have gladdened us. Colonel Wilcox, like so many other Northern business men, had to enter the Army of the Federals at the time of the late unhappy struggle in the States, and when engaged in this struggle he rose to the rank enunciated. When all was over, he resumed his position as a New York citizen. We were much pleased to meet with him once again, accompanied as he was by his son, Dr. Wilcox, who graduated in London, but is now a professor of one of the various departments of clinical medicine in New York. "No fool of a man" we adjudged him to be.

Among our callers, too, was Mr. George Eastman, of Rochester, whose name is known all over the world in connexion with many ramifications of photography for the million. It is to this gentleman we owe the coinage of a term—the "Kodak"—which seems now to have taken its place in our English literature. George Eastman was at first a skilled practical mechanic, then a banker, and is now one of the high priests of Baal, whose worshippers at the present time are more numerous than even in the period of the unhappy struggles between them and the worshippers of other entities in the days of Elijah. Alas, that we have seen so very little of the face of our own special object of adoration during the summer of 1894! May October make amends!

A Regal Convention Issue.—Without doubt the best value in the serial literature of photography in America that has yet been given for a small amount of money is the Convention number of the *Photographic Times*. It is brimful of photographs and good reading matter, and sells at the low price of fifteen cents. The writer of the article on photo-relief processes has a very just appreciation of the inestimable services rendered to this department of photography by the late Walter B. Woodbury; in fact, Woodbury may be said—and this in the most unbegrudging manner possible—to have not only alone and single-handed created the general principle of photo relief, but to have worked it out in all its ramifications. He was a man of genius.

Apparently as a foil to the many fine pictures in this number, there is a portrait of a tousely headed lady, "photographed from life by Eustace Calland," appropriately set in the midst of a species of murder story. It is a full-faced fuzzytype, suggesting the employment of an unstopped-down spectacle glass, and a bad one at that, as the lens by which it was taken. And yet who knows? There may be some who like this sort of thing. Turn from this to the exquisite photogravure which serves as frontispiece, and what a contrast is observable in pose, lighting, and execution!

American Conventions.—From a subsequent issue of the *Times* we learn that the fourth Annual Convention of the Photographers' Association of Ohio, which was held at Columbus last month, when contrasted with the Convention of the National Photographic Association of America, is far and away ahead of it. It was conducted on better lines, gave more useful and practical information, and was attended by far more photographers. The exhibits, too, were better.

Bogardus' Opinion of Excessive Retouching.—Mr. Abraham Bogardus, writing in the *St. Louis and Canadian Photographer*, *àpropos* of a foolish remark made somewhere, that the

more the negative is manipulated by taking away all photographic effect, the more artistic the picture, attacks this dogma with a sledge hammer. "If it is art," he says, "to obliterate truth, then the less we have to do with art the better. Should anybody be so lost to truth as to obliterate from one of Jackson's views of the Rockies the most unsightly stump, broken and ragged as it may be, he would detract from the real value of the picture in the estimation of all lovers of nature in its wildness. No! let the photograph alone if you would have the perfection of art. What! man's ideas more artistic than those of the Almighty Architect of this beautiful world?"

AN INSOLUBLE SUBSTRATUM FOR CARBON WORK.

HAVING seen various plans published for the preparation of glass for the reception of the carbon image, I presume that it is not generally known that so-called insoluble gelatine is soluble in acetic acid, and offers one of the best if not the best means of preparing glass plates prior to the transference of the carbon tissue. The following formula, which was devised by the late Mr. William Bedford, is most readily made, and answers the purpose admirably, reducing the trouble of gelatinising plates to the least possible quantity. Take hard gelatine 5 grammes, soak and melt in water 100 c.c., then add sufficient of a five per cent. solutiion of chrome alum to precipitate the gelatine thoroughly, and dissolve it by means of heat in a water bath, in glacial acetic acid 50 c.c., add gradually methylated spirit 200 c.c., and filter for use. The glass being thoroughly cleansed, pour on a small pool in the centre, just as if coating with collodion, pour off at one corner, and put in a rack to dry, which in a warm room will take place in a few minutes. A number can be prepared at a time, and are always ready for use.

EDWARD DUNMORE.

MR. MASKELL AND PHOTOGRAPHY.

"You ask me to tell you something about my opinions. These, I think, have been pretty freely expressed in papers furnished to various periodicals, or read before societies, from time to time. My interest in photography is extremely limited," says Mr. Maskell in the *Photographic Times* (New York), "and confined entirely to the expression of art by its means, and this, by the introduction of personal feeling and by the personal impress of the artist's craft, overpowering all considerations of the means employed. It almost compels the use of practices which by some are thought to be unphotographic; but, if what has been for many years considered the essential characteristics of photography be the only criterion of true photography, I have no hesitation in saying that a photograph, in its pretensions to be a work of art, is positively to my mind a thing to be abhorred. I claim, however, that any graphic representation produced by the action of light on sensitive substances is a photograph, and that neither a lens nor any special use of one is an essential, nor even, strictly speaking, a camera. However seemingly beautiful the effects may be which are produced by pure mechanism, I cannot admit their claim to the name of art. My views upon the claims of photography to that distinction were expressed at length on opening a discussion at the Camera Club on June 4, 1891, a discussion which was, in fact, a challenge to Mr. Joseph Pennell (who was present and replied) to substantiate the strictures which he had brought against this claim in a paper read by him a short time previously at the Society of Arts. The paper and discussion are reported in full in the number of the *Journal of the Camera Club* for July, 1891. With regard to my practice, I rarely use a lens, and I have always advocated the effects produced by the pinhole. I consider diffusion and suppression of detail to be absolutely essential, and I know no other method which gives such satisfactory results as the use of the most natural and simple implement, viz., a light-tight box with a hole in it. The idea which has been advocated o making the principal part of a picture sharp and throwing the remainder out of focus is not, in my opinion, to be recommended. I have never yet seen a successful application of this principle, and, happily, it may be said to be a thing more preached than practised, for we seldom find examples at our exhibitions.

I wish to see the manipulation in photography reduced to its simplest expression. The practical value of the mass of scientific papers written about photography is, I think, so far as art is concerned, of very small account, and I would say the same of the inventions and implements, such as developers and the rest, which have made their appearance in such numbers for many years past. Having no pretensions to scientific knowledge, learned dissertations, involving abstruse calculations and chemical investigations, are to me without interest, nor do I care even to attempt to follow them. Use a lens, if you will, judiciously, or do without it; take pyro (or some equivalent reagent), bromide and an alkali and, with a suitable and equally simple printing method, you have all that is necessary in the way of apparatus for the production of the most artistic photograph ever exhibited. Nor is proficiency in the use of these materials a matter which may not be easily acquired in a very short space of time. But it is not proficiency in their use alone which will make an artist-photographer, neither will any amount of scientific knowledge concerning them advance one iota toward this end. As to the value of the mass of inventions I have just spoken of, I have no hesitation in saying that it is of little consequence, after all, to those who nowadays follow seriously the pursuit of art in photography. If we look around the walls of such an exhibition as the Salon, we shall find scarcely a picture the effect of which could not have been equally as well produced with the processes of twenty—nay, even, if we compare them with the admirable calotypes of the earliest days of photography—of forty years ago. Collodion is, if necessary, equal to any artistic refinements of pictorial photography; rough papers can still be sensitised with the processes of these days; carbon we have yet with us, and the earliest forms of pigment printing are again being introduced (and I may say, *en passant*, that I anticipate from this revival before long the happiest results). Platinotype, alone, has been a distinct addition to our resources, of very high value.

I should only weary you if I were to enlarge on all the points which may suggest themselves regarding the opinions which you have asked me to express. I believe in the capabilities of art in photography, but I am bound to admit that its practical exponents at the present time—those who may be said to be artists—may almost be counted on the fingers of both hands. I am sensible of the attraction and interest which have combined to spread photography among thousands and thousands of people. At the same time, I think if we are really to consider photography as an art, its popularity is of very little importance, nor ever likely to lead to any results of value. I think exhibitions are overdone. It is easy nowadays to produce something which appears to have resemblance to a picture, but not one in a thousand of the things exhibited at most of our photographic exhibitions has any claims to be so placed. What is called professional photography continues to show no abatement, neither does it exhibit any variety. As a mechanical industry it is, no doubt, a triumph of mechanism. As art it is everywhere an abomination. Could it be otherwise, when we consider that, from the manner in which the results are brought about, it must necessarily be mechanical to the last degree? Is it not a palpable and instructive fact that, if we should take the half-dozen leading professionals in all the chief cities of the world, we should find that there is not a pin to choose between their productions? In every case there is the same mechanical system, the same results of a stereotyped method of posing, lighting, and subsequent retouching. And it is no less an instructive fact to consider that this retouchiug, which destroys or alters the lighting and modelling of the figure, is almost invariably done by operators who have never seen, and have no sort of knowledge of, the sitter. One might well ask, indeed, if there be art in these productions, who is the artist? One of the greatest names in the professional world lately avowed that he had never devoloped a plate or printed a print in his life, and doubtless there are many others whose names are blazoned on their house fronts who would have to make the same admission. Query then, find the artist? That we have, nevertheless, among us some few who, although called professionals, are yet artists, the Photographic Salon at the Dudley Gallery showed us last year. Their courage in emancipating themselves from a purely commercial business has borne fruit, and will, I believe, become still more fruitful. When I mention the Photographic Salon, I mention that which, since the inception of the idea, I have had most at heart. I think it has been a potent factor for good, and its influence will be felt more and more year by year. Whether or no the ideas it encourages tend to the advancement of what is called *pure* photography is, according to my ideas, a matter of indifference."

[As a commentary on Mr. Maskell's ideas about art in photography, the following remarks of Mr. Holman Hunt will be read with peculiar interest we are sure.—ED. *B.J.P.*]

MR. HOLMAN HUNT ON THE APPRECIATION OF ART.

"WERE I to speak on art, my one strain," says Mr. Holman Hunt in a letter to a correspondent, "from beginning to end, would be to caution my audience in their judgment against the authority of the theoretical teachers, and to advise them to rely instead on their own best judgment.

I imagine that their interest in the subject would be not as practical artists, but as men with a desire to cultivate a sound sense of appreciation for what is really capable of elevating the taste. For this there are many treacherous snares in the present day. Doctrinaires go about laying down dogmas—for instance, that all work should have moral teaching, or that it should have none; that everything should be minutely finished, or that it should be done as much as possible without exact elaboration; that everything should be idealised, or that nothing should be more than real, or different than the accidental fact. This is but a brief enumeration of the laws laid down by theorists, who are all wrong in making hard-and-fast rules. You will have heard of the different fashions of the day, and you will have seen some of the productions of the new schools. My advice is, Not to be taken in by any declaration that such a work is in the 'correct style.' If a work does not, on sober examination, give you the conviction that nature in that phase is sweeter or nobler than you thought before, it is not good to you; and do not be frightened out of your judgment, which on art ought to enable you to decide on the value of a particular work, as much as you can on other questions. Some delights are not lasting. Seek those that train the soul to love life, your fellow individuals, and the community at large, and eschew all others."

PRINTING FROM ENLARGED NEGATIVES.

It may be taken for granted that a printing process which suits the fine detail of a small negative may be largely improved upon when we come to treat magnified reproductions. Such enlarged negatives invariably show some degree of coarseness, rendering the use of albumen paper almost an impossibility and employment of glossy surfaces generally a mistake.

It happens, however, that for large prints a matt or rough-surface paper is conceded to be most artistic, or, shall we say, in better taste. It also conveniently happens that the use of such rough or matt-surface paper most effectually obliterates all signs of the above-mentioned deficiency, and it follows, therefore, that, when printing from enlarged negatives, we choose a surface which comes up to these requirements.

Carbon, platinotype, and bromide have so far been most in use, all possessing most desirable qualities, and six months ago I should, no doubt, have treated of the two latter as most likely to be favoured by the amateur; but so quickly do matters progress in our science that *now* I should be glad to know, apart from any questions of permanency, what could we desire better than the *matt* printing-out paper? Certainly, so far as I have used it, it gives the utmost satisfaction and practically leaves nothing to be desired. Without doubt the amateur will find it the most reliable and economical (to say nothing of its simplicity) process by which to secure prints from his enlarged negatives.

But, firstly, the treatment of the negative must be considered, this being of great importance, as we naturally wish to give our work the requisite degree of finish.

An enlarged negative is usually somewhat coarser in grain than the original; in other respects—for density, detail, cleanness, and sparkle—it may be, and often is, much superior. We must, however, always lay ourselves out for a certain amount of work in connexion with them in any direction tending to improvement, not only in their printing, but artistic, qualities. Hence, in all cases, a rule may be made to avoid *too great density*. We can more easily put *on* density, or what takes the place of such, than remove it. We can do much to improve a negative which is rather *weak*, and that too with much satisfaction to ourselves, but one which is over-dense is more or less an abomination.

A first rough proof should be taken, toned, fixed, and roughly mounted. We can then see at a glance what may be done in the way of "betterment."

The sky is generally a weak part, and usually requires blocking out altogether. If the subject is an architectural one, this blocking out is a simple matter. We improvise a retouching desk, that is to say, rest the negative face up in a frame, using a piece of white paper as a reflector. Viewed thus by reflected light, a dense colour —amber or Venetian red—is applied with a fine brush along the entire sky line, working into all the deviations of the stonework, and continuing this to a uniform depth of a quarter of an inch. The remainder of the sky may be finished on the *back* of negative, using red or brown paper carefully cut to the outline and pasted on. Care is taken when the negative is of large size to allow for the expansion of the wetted paper, but this is a detail readily treated by the operator. Enough to say that the *sky* is to be blocked out entirely, and colour or paper applied, without infringing in any way upon the detail of the building.

Now, once more giving attention to the rough print, we may conclude that certain parts would be better for more contrast. We can with a soft lead pencil work up and lighten these parts very effectively, giving point and emphasis to a rather heavy mass of stonework. A single experiment is enough to give the beginner an idea what it is safe to do in this direction; we can only hint generally at what may be attempted in the way of technical improvement.

Very often the printing capacity of the negative will be improved if it is given a backing of mineral paper or tracing paper. This paper will be found in many respects better than matt varnish.

A piece of mineral paper is cut rather smaller all round than the negative; it is then brushed over with thin starch paste, then applied to the back of plate and gently squeegeed. It is advisable to have the negative face down on a clean flat surface, as a blotting pad, to absorb any misture which is likely to ooze out round the edges on application of the scraper.

We can work with great ease upon the dry-paper backing with pencil, stump and graphine, or colour. Certain portions may be cut out to admit light more readily to these parts, other places also may receive a second layer of paper to still further soften the effect.

Landscape negatives are often troublesome. If the sky prints through of a distinct and uniform shade, the question will arise whether to block it out altogether or endeavour, by application of masses of colour to the back, to break up this objectionable feature into pleasing cloud effects. We are often assisted in this work by an already dim outline of cloud, which only requires strengthening to make it workable. Considerable skill is required and may be exerted; failing this, it is easier to make the negative print an entirely *white* sky. This cannot be done quite in the same way as in the previous example. The work had better be entirely on the *back* of negative and partake more of the nature of a vignetting process, sharp lines being by no means, or very rarely, permissible.

An enlargement of mine often comes in for commendation—"That's a nice cloud! How well it suits the landscape!" "Yes," I reply, "it does." And this is true; but it was all pure accident. On account of an ill-judged effort at economy of solution, the plate was unevenly developed, showing certain streaky lines and patches in the sky and between the branches of the trees. By the application of mineral paper and some work with a stump and blacklead, a particularly neat cloud has been formed. I take no merit for this, but it shows that sometimes a mistake may be turned to good account.

Many enlargements owe a very great deal to the "sky" printed into it. It is therefore very desirable to have a fair assortment of sky negatives—*home-made by preference*, but *bought* ones rather than none at all. Of course, the usual objection to bought cloud negatives is that you have no monopoly in that particular umbraceous effort; it may be the cloud of a dozen other fellows.

The worker should, I think use his own clouds, *i.e.*, negatives he has himself made, and certainly, if he has been able to make an enlarged negative of his landscape or castle, he can as easily make one from his "sky" negative.

Sky negatives should be on paper to be of most use; they can then be printed from either side as may be most suitable in the direction of lighting. A large printing frame should be used, fitted with plate glass; one 20×16 will do for 15×12 prints. We have to adjust the print to the part of sky negatives we wish to insert, and this can only be done conveniently by using a good-sized frame. It is best to print all the copies first, and then print in the skies one after the other. The sky negative will be held up to the light, and the print adjusted to it, both then placed together in the frame. While in this position it will be well, with a little gummed paper, to fasten the cloud negative to the glass by the corners, also to make some kind of index by which the succeeding prints may be, without any preliminary delay, placed at once in the frame. There is no great skill required in the mere *technical* operation of printing in a sky. The adjustment made, print and negative in contact, the hinged back is fixed, and the frame taken to the light, by means of a soft velvet focus cloth we roughly cover up the landscape, taking care not to cut the line of demarcation too fine, and not allowing the cloth to remain exactly in the same place all the time. The sky may, and should, impinge slightly upon the landscape, but this should be softened so much by shading as to show no perceptible line or mark.

I have mentioned "matt P.O.P." So easy will this be found in working, that any detailed description would be quite out of place. Enough to say that any one who can turn out decent prints on the enamel P.O.P. will not fail with the new paper. At the same time, many difficulties incidental to a highly enamelled surface, such as

drying and mounting, are entirely absent. These two items in themselves are enough to commend it to workers and manipulators of large prints. The finished prints are more like those by the carbon process than any I have ever used. Make a good print in single transfer and cold-press it, and you have the appearance of a matt P.O.P. print. I content myself with the ordinary warm tone, but, from all accounts which there is no reason to doubt, a great variety of tone is to be had from warm browns, and sepias to black.

Prints having been obtained and finished by mounting, we may have to do a little spotting in order to complete our work, the paper under notice takes all this, using the proper colour, without giving any visible sign of the fact. This little point even is not to be despised.

It must not be forgotten that the prints dry a little darker than when looked at in the ordinary way; hence, while making a little allowance during printing for some loss of strength while toning, &c., it is well to be careful not to overdo it.

For warm tones, a diluted bath (the Ilford sulphocyanide) should be used, and blacks by the same bath with an increased quantity of gold. Enlarged negatives in my experience are invariably *vigorous*, or at least can be made so, hence they lend themselves particularly well to a printing process which will give good black tones.

I hold that every man should make the most of his negatives or prints by any dodging or working up which he may deem necessary and which will tend to improve them; such a practice introduces a personality which is, to say the least, desirable. These efforts may not invariably be in the right direction, but, as efforts, they should be commended. I read somewhere, I believe in an article by Mr. V. Blanchard, that an artist or painter does not hesitate at the last moment to touch up his work here and there, strengthening or softening as the case may be, in order to produce more contrast or harmony. Certainly, when working with enlarged negatives, the enthusiastic worker has full scope for ingenuity, artistic capability, and technical powers.

J. Pike.

DEVELOPMENT WITH THE ALKALINE CARBONATES.

Part II.

In the paper which appeared in the issue of this Journal for August 3 last, I proposed to myself the task of instituting a comparison between the merits for photographic purposes of the several carbonates that are found capable of taking the place of ammonia in the ordinary process of development with alkaline pyrogallol.

I pointed out that there are four salts — the carbonates of potassium, sodium, lithium, and ammonium—available for the purposes of the photographer, and, after a few remarks on their properties and chemical constitution, addressed myself to a careful consideration of the manner of making up the experimental stock solutions.

The mode of preparation of these solutions, as I showed, is necessarily dependent on certain elementary chemical principles, a disregard of which would result in the failure of our attempt to institute an accurate comparison between the qualities of the developers. In other words, we must take into account the wide difference which, in regard to molecular constitution, exists between the several salts we propose to employ.

Carbon dioxide is, as we know, a constituent common to all, and accordingly we cannot do better than choose, as a convenient basis for our calculations, the definite numerical series that represents the combining proportions of this substance.

Our procedure, in practice, is as follows: we make up a number of standard solutions, each, in so far as regards the amount of carbonate dissolved, of a different strength, but at the same time containing an equivalent of combined carbon dioxide which remains constant for a like volume of each of the remaining solutions.

At this early or theoretical stage of the inquiry, I had just arrived at the conclusion of my former paper, after having given a full share of attention to the manner of making the short and simple calculations whence our formulæ are deduced.

There is, however, one point that seems to deserve a fuller treatment than my former opportunities permitted me to give it, and whose importance must be my justification for making a brief digression from the natural course of the present article.

I allude to the developing properties of ammonium bicarbonate. As has been already said, this salt is one of the products of a peculiar form of chemical decomposition which ensues when the sesquicarbonate of ammonium is dissolved in water. The other product of the reaction is the neutral carbonate of ammonium. Our sesquicarbonate developer, then, is a compound solution, containing two salts, each of which has its own special influence on the process of development. Merely to study the properties of what is not a single developer, but a mixture of two, is a very unsatisfactory and unscientific way of going to work. What we really require is some definite information as to the respective developing properties of the two salts we are employing, and this, obviously, cannot be obtained unless, by testing the one in the absence of the other, we can free ourselves from the complication that results when both are employed together. On this account, we shall require, in addition to our former standard solutions, one of ammonium bicarbonate.

Following the same principles which guided us when we last went to work, we find, firstly, as the result of experiment, that 100 grains of ammonium bicarbonate, when treated with an excess of acid, will yield us, as nearly as possible, 55·69 grains of carbon dioxide. The amount from 10 grains we will, for convenience, call 5·57 grains, and multiplying this, as in our former example, by 3·2, we have 17·82 grains for product, otherwise the amount of the dioxide which 32 grains of the bicarbonate will yield us. The unvarying quantity of this gas which we obtain from a single fluid ounce of each of our standard developers is 2·44 grains. As one fluid ounce of the standard sodium carbonate solution contains just 16 grains of the crystallised salt, we take for our calculation half of 17·82 grains, *i.e.*, 8·91 grains, and arrange our figures in this way:—

$$8{\cdot}91 : 2{\cdot}44 :: 16 : x.$$

We thus find for the value of x, 4·38, and this is, of course, the number of grains of ammonium bicarbonate that we must dissolve in each fluid ounce of water in order to produce the theoretical amount of carbon dioxide, 2·44 grains.

As I was unable to procure a sample of ammonium bicarbonate for the purpose of my experiments, I prepared my stock solution of this salt by saturating a dilute solution of ammonia with carbon dioxide gas. The strength of the ammonia solution was such that each fluid ounce contained exactly 3·13 minims of concentrated solution of ammonia of specific gravity ·880. This, on saturation, produced a stock solution of the proper strength, that is to say, one containing, to each fluid ounce, just 4·38 grains of the bicarbonate. I hardly think I need say anything in regard to the calculations by which these latter figures were arrived at. The bare results will probably be found sufficient for such of my readers as may desire to repeat the experiments for themselves.

I now pass to the second or practical stage of the inquiry.

In order to secure uniformity in the preliminary operations, I took certain precautions:—

Firstly, all the plates employed were of one definite degree of rapidity.

Secondly, each of these plates was exposed to light under the same negative.

Thirdly, the quality of the light employed was constant throughout the exposures.

Lastly, all the exposures were of equal duration.

Fourteen gelatino-bromide plates, of a medium degree of rapidity, having been selected, each in its turn was exposed to light under the chosen negative. The latter was of the finest quality that could be obtained, and was particularly remarkable for its wide range of tone gradation.

The light to which the plates were exposed was that of a gas flame, distant one foot from the printing frame, and the time of exposure amounted to thirty seconds.

The plates were intentionally slightly over-exposed, the correct exposure required in each case amounting to only twenty-three or twenty-four seconds.

Experiment No. 1.—The exposed plate was developed for two minutes in ordinary pyro and ammonia solution, the proportions per fluid ounce being 2·25 grains of pyrogallol, ·47 grain of potassium bromide, and 1·87 minim of ammonia, the latter of the usual specific gravity of ·880.

The details were completely visible when one minute had elapsed. The resulting image, though of fair quality, was decidedly weak, and showed a want of due contrast.

Experiment No. 2.—The standard solution of lithium carbonate was employed. The quantity of pyrogallol added was as before, 2·25 grains to each fluid ounce of the alkaline solution, and in all the subsequent experiments the same proportion was adhered to. The development lasted for one minute and a half, but all the details of the image had made their appearance in forty-five seconds' time. The result was a yellowish-brown positive, of a quality superior to that of the former image, but still lacking both in density and the finer gradations of light and shade.

Experiment No. 3.—The lithium-carbonate developer was again

employed, but with the addition of a restrainer, in the form of half a grain of potassium bromide to each fluid ounce of solution.

The details came out in ninety seconds, and the development lasted altogether for two minutes and a quarter. The resulting image was of fine quality, and rather brilliant, with well-marked contrasts, and of a golden-yellow tone.

Experiment No. 4.—The plate was developed with the standard potassium-carbonate solution. The details made their appearance in forty-five seconds, and the development lasted altogether for seventy-five seconds. The image produced was of an orange or yellow-brown tone, fairly good, but slightly wanting in contrast.

Experiment No. 5.—The potassium-carbonate developer was employed again, half a grain of potassium bromide having been first added to each fluid ounce of solution, as in experiment No. 3.

All the details were visible when one minute had elapsed, and the time of development amounted to two minutes and a quarter. The result was an image of a rich golden tone, vigorous and full of contrast, but slightly over-dense.

Experiment No. 6.—Solution A (ammonium sesquicarbonate and free ammonia) was the developer in this case. The development was rapid, lasting only one minute.

The details were completely visible in twenty seconds. The resulting image, which was of a light brown tone, was somewhat weak. Decided traces of green fog were visible round the margin of the plate.

Experiment No. 7.—Solution A was employed, with the addition of the usual proportion of restrainer.

Twenty-five seconds elapsed before the details were wholly visible, and the development lasted altogether for seventy-five seconds.

The result was a rather dense positive of a rich brown colour, with well-balanced contrasts. By reflected light no green fog could be discerned; but, on examining the plate by transmitted light, a very faint brown tint or stain extending round the margin was just visible.

Experiment No. 8.—The standard solution of sodium carbonate was employed.

The development lasted for one minute and forty-five seconds. Fifty seconds of this period had elapsed before all the details were visible.

The image produced was of medium quality, and of a brownish-yellow tone. The density obtained was insufficient.

Experiment No. 9.—The developer consisted of standard sodium-carbonate solution and bromide of potassium. The details came out in eighty seconds, and the development lasted altogether for two minutes and a half.

A positive of good quality was produced, the tone of which inclined to yellow. The density was fairly satisfactory, and the gradation of the half-tones was scarcely inferior to that obtained in experiment No. 7.

Experiment No. 10.—Solution C, the weaker of the two remaining stock solutions of ammonium sesquicarbonate, was the developer employed. The details were not completely visible until fully four minutes had elapsed. The process of development extended over eight minutes.

The result was a vigorous brown positive of excessive density, but with plenty of contrast. Green fog and blue markings appeared round the margin of the plate, and showed brown by transmitted light.

Experiment No. 11.—The plate was developed with the standard solution of ammonium-bicarbonate. The image did not begin to appear until the plate had remained for five minutes in the developing bath. The details were fully visible in eight minutes and a half, and the whole time of development amounted to fifteen minutes. A thin reddish-brown positive of rather weak quality was the result. The details of the original were marred by a light brown tint, which, extending over and obscuring the high lights, produced a disagreeable monotone effect. There was an entire absence of surface stains, but by transmitted light a brown tint due to green fog was apparent.

Experiment No. 12.—Solution B (the concentrated sesquicarbonate) was the developer. The image began to appear in about two minutes, and had fully revealed itself when five and a half minutes had elapsed. The development lasted altogether for twelve minutes. The positive produced was of a brown tone, of fair density and full of contrast, but considerably stained at the edges, round which a border of a brown colour, due to green fog, was visible by transmitted light.

Experiment No. 13.—Solution B, modified by the addition of the customary proportion of bromide, constituted the developer. The process of development was a very slow one, lasting for no less than twenty-eight minutes. Fourteen minutes passed before the image began to appear, and twenty-two before all the details were visible on the surface of the plate. The finished image was of excellent quality, and of remarkable brilliancy and clearness. Notwithstanding the long immersion in the developing solution, not the least trace of stain or fog was discernible.

MATTHEW WILSON.

(*To be continued.*)

LETTERS TO A YOUNG PHOTOGRAPHER.—III.

MY DEAR RICHARD,— . . . . To return to the prints. I must thank you for relieving me of the necessity of ascertaining, by experiment, the particular process by which they were made. I should not have guessed that they were on gelatino-chloride paper. Again, the films themselves are of such a consistency that I doubt if any method known to chemical science could determine whether albumen, or gelatine, or collodion, or what was the vehicle which originally held the sensitive salt. Mark the word "originally," my dear Richard. You have carried out the operations of printing, toning, fixing, and washing in such a manner that, while producing the most novel effects in so far as the actual image is concerned, you have subjected the vehicle itself to such a drastic kind of treatment that you have succeeded in converting it into a mysterious organic substance which defies analysis, and which, to my thinking, would probably find its most useful office in being turned into bullet-proof garments. If you can recall the precise method by which you attained this remarkable result, it might be worth your while to submit a mass of gelatine to similar treatment. If the same kind of effect is thereby produced as on the gelatine of your prints, pray make haste to patent the idea, and then submit it to the War Office. It would make your fortune, for, clothed in your patent bullet-proof gelatine, Tommy Atkins could afford to regard a storm of bullets with as much nonchalance as he would a shower of rain.

And now to discuss your prints technically and pictorially. Frankly, my dear Richard, I interpret your wish that I should guess the precise means by which you have obtained the amazing effects in positive printing now before me, more as an indication that you are anxious to provide me with a little intellectual amusement in attempting to solve a difficult problem than as betokening any degree of faith in the sureness and certainty of my being able to reach the same end by the exercise of my photographic knowledge. You ask: "How do you think I got these tones?" I give it up, but I will try and guess, and will therefore run over the various modifications capable of being introduced into the usual system of toning and fixing gelatino-chloride prints which might help to give a print some such appearance as that possessed by yours. In so doing I may possibly guess your secret. If I do, will you tell me? I promise you I will not give it away; it will be too precious for that.

First of all, setting aside for the moment their art qualities, let us calmly and dispassionately survey your prints as technical productions. So considered, what have we? The prints are, I suppose, intended to represent landscapes with evening effects. The foreground in each one is very dark, and the sky is as dark as the foreground. The very black patches in the sky are, no doubt, clouds; the minute circular spots and the larger one are, I suppose, the stars and the moon. There is not a bit of white paper on the prints; they are, in fact, as dark as Nature herself at night time. The tone is not purple black, it is not brown, sepia, or red, it is not blue, it is not green—it is a combination of all six. Taken as a whole, the prints, as I hinted to you in my last, are quite unlike anything of the kind I have seen before. They are not comparable to anything producible by any or all of the graphic arts, singly or mixed, or in any combination. They are the first articulate utterances of the New, the Newest, Photography! I am convinced, my dear Richard, that future ages will acclaim you as the Founder of a School, the Apostle of a Movement, for your prints are in every sense a departure from the withered conventionalities of print-making hitherto in vogue. They are, in fine, unique; they palpitate with soul, they make me think—oh, such a lot!

We have heard lately a great deal of the advantages of toning after fixing. Have you been trying this on your prints? If so, I should be curious to know how you succeeded in depositing as much gold in the lights as in the shadows by this method. Or, again, you may have developed up partly printed images. In that case it might be well to point out to you that you need only develop the actual image, not the whole of the silver deposit, exposed and unexposed. I recall some experiments made by somebody with the view of depositing gold on paper before it was printed. This might give the effects you have got. To fix the paper before it was printed would not perhaps conduce to the formation of an image unless you were careful to leave some hyposulphite of silver on the surface, in which case a perfect result would possibly be secured, although such a method would entail certain obvious disadvantages. The addition of an alkaline developer to the gold toning bath might possibly lead to the better precipitation of gold on the print, but then you would sacrifice, as you possibly have done, the discriminative action which a toning solution should possess. I know your habits of independent thought so well as to be assured that you did not wash the prints to

remove the free silver before placing them in the toning bath (that is, you used such a bath, which is not clear); and I am equally positive that after toning and fixing you were quite indifferent to the somewhat debatable advantages of passing the prints through a solution of plain water. As, no doubt, you surmise, modern prints suffer from too much washing. I am glad you endorse the admirable experimental work of Mr. Haddon and Mr. Grundy.

How far you printed out in the first instance, or indeed, whether you printed at all, I cannot quite decide from your specimens. *If* you printed, then I should assume, from the appearance of the images, that the back, and not the front, of the paper was placed in contact with the negative. This is a neat and effective way of getting softness. In trimming the prints, you have risen superior to the slavish custom of keeping the lines of the margins at right angles, which is another indication of your habits of independent thought; while in mounting them, you have declined to recognise any relation of symmetry between the outer dimensions of the prints and those of the mounts. I presume that the large quantity of the starch mountant which appears on the faces of the prints was added to secure a matt effect. At a distance, the appearance of the print is, doubtless, greatly improved by the artistic way in which you have put the mountant to such novel uses. Regarded at the normal focus of the eyes, however (say eight inches), your intention is not clear. Still, this is a detail of the new photography, the full significance and philosophy of which have yet to be grasped.

Notwithstanding your kindness in asking my acceptance of them, I return you the prints, for I am persuaded that some day you will value them to a degree far beyond what I should. They are destined to be historical. They mark an epoch in photography. They may be fated to be imitated; they will never be surpassed. Keep the method a secret; and some Sunday morning, when time hangs heavy on your hands, let me suggest that you try the old fashioned way of printing and toning. Although I do not suppose that you will be induced to adopt it in preference to your own startlingly original system, yet there are points in it, and certain qualities in the results it gives, which may strike you as worth committing to memory, in case at some future time you may want to know how the photographers of this decadent period produced the results which twentieth-century public opinion, with you at its head, will look upon with amused curiosity and contempt.—I am, yours, &c., Junius Junior.

PS. I enclose the prints. Send 'em to the Salon!—J. J.

THE DENSITY OF THE IMAGE IN RELATION TO ITS PERMANENCE.

Probably there is nothing in connexion with photographic discussions in which there is a greater muddle, or more misunderstanding, than what is meant when speaking of the constitution of the photographic image.

As a rule, we speak of the image of a print as a deposit of metallic silver, and argue therefrom that any change that takes place in the print must necessarily be the same as the chemical action of a substance upon that metal: for instance, the combination between silver and sulphur, when polished silver is tarnished on exposure to the atmosphere. To an extent, the results are the same as far as the silver is concerned, but the point I wish to take up now is to show how little the silver on an ordinary print can affect its fading. There are many problems far more complicated than the conversion of the silver into a sulphide to be solved before we can understand fully the causes of the fading of our albumen prints.

Our old friend "Free Lance" recently referred to the noted investigations of MM. Davanne & Girard. If I remember right, those gentlemen looked upon the image as practically a deposit of metallic silver, and thought there were two isomeric forms of sulphide of silver—the black and the yellow—and that fading was the gradual passing of the former into the latter. Others thought that the change in the colour of the image was caused by the black sulphide of silver absorbing oxygen, and being converted into a sulphate.

But, if we look into the matter closely from another standpoint, we shall find that any chemical change in the silver can have but a very slight effect on the fading of the image. Sulphide of silver is about as permanent a substance as we can have; the mischief is that there is not sufficient silver in the print to give proper covering power when changed into a sulphate.

In previous articles I have shown that density of image in a developed film does not depend upon the amount of silver contained in it. And we find the same law holds good in a printed-out image. Take, for instance, an emulsion formed with a chloride and citrate, and another prepared with a chloride, and the equivalent to the citrate formed by a carbonate and citrate acid. The results are entirely different both in covering power and colour. The fact seems to be that everything depends upon the mysterious combinations of silver with organic matter previous to the exposure to light, and that it is due to these combinations that the density colour and quality of the image depends, and not upon the quantity of the metal itself in the film. That this is so was proved to me very forcibly some time since during some experiments I was making with albumen and silver, during which I obtained results totally opposed to all ideas that I had had in regard to the formation of albumenate of silver and the action upon it of light.

We all know that if we coat a sheet of paper with albumen containing a chloride such as that of ammonia, dry it, and float it upon a silver bath, that the film will contain chloride of silver, albumenate of silver, and some free silver nitrate. On exposure to light, we obtain a dense deposit of reduced metallic silver and other substances, which I will refer to later on.

Now, I thought if I could prevent the coagulation of the albumen by the silver, I could then obtain a chloro-albumen emulsion, with which I could coat paper, and we would not have the trouble and mess of floating the paper on the silver bath. After a time I succeeded in making a perfect albumen emulsion, without any coagulation or deposit. I used the same amount of chloride and silver as would be used in the albumen film on a sheet of paper. I expected after that that all would have been plain sailing, but now the strange part of the business began. I coated glass plates with the emulsion, dried them, and exposed them to bright sunlight; and, after several hours, could get no reduction, or, at least, only the slightest possible change (nothing like a recognisable image). I added forty grains of silver to each ounce of albumen beyond the silver required by the chloride, and still no change after hours in bright sunlight.

Using the same sensitising solution with gelatine, I obtained a dense and rapid reduction by light; but with albumen, which is supposed to form a far more definite compound with silver, light had no reducing action, practically, whatever.

To return, however, to the subject of compounds that are reduced by the action of light. Although it is surprising what a small amount of silver is actually present, or is required to obtain density in a dry-plate film, yet, when we come to investigate the constitution of the image on an albumen print, we obtain results so startling that it becomes a question whether we ought to call them silver prints at all.

Where we have been on the wrong track appears to me that we have been thinking of the metallic silver and gold in the image, and overlooking almost entirely the important part that the organic matter which is thrown down by the silver in its reduction by light plays in the constitution of the density of the image and its permanence.

Experienced men find that a sheet of ordinary albumenised paper requires, to obtain a good, plucky image, about twenty-eight grains of silver nitrate (converted into chloride, albumenate, and free nitrate). If these twenty-eight grains of nitrate of silver were reduced by light to a metallic state—that is, by the blackening of the film all over—there ought to be 17·78 grains of metallic silver in the sheet. But what do we find after the paper has been through the hypo bath and washing waters? Professor Hardwich found less than half a grain; other analysts have, I believe, found nearly three-quarters of a grain, but they probably used double-albumenised paper, and there would no doubt be some silver bound up in the coagulated albumen that, in the former case, would have been removed in the hypo bath from the thinner film. We will say there is half a grain. Upon that basis, it will require a sheet of paper *four feet long by eighteen inches wide before we can obtain a single grain of silver* from the dense deposit forming the blackened image all over the surface of the paper.

Can we imagine, for one moment, that it is possible for that one grain of silver to cover up, with a proper density, six square feet of paper? or that the fading of the image can be simply due to the chemical action of the sulphuretted hydrogen in the atmosphere converting that small amount of silver into a sulphide?

We now come to some points that I have never seen or heard referred to, but they are of the greatest importance.

There is only one grain of metallic silver in the blackened film on six square feet of paper. To obtain that, only about one and a half grains (1·57) of silver nitrate would be required. And yet, for a piece of paper of that size, fifty-six grains of nitrate of silver have to be used to obtain proper printing qualities. Why do we have to use those extra fifty-four and a half grains of silver, and what part do they play in the formation of the photographic image? They do not of themselves form the density of the deposit, because they are removed in the hypo bath and washing waters.

It is evident, therefore, that their only use, upon being acted upon by light, is to combine with and throw down in the film a deposit of organic matter, and that after that their work is done, and they are converted in the fixing bath into the form of hyposulphite of silver, which is dissolved in the excess of hyposulphite of soda present, and afterwards removed in the washing waters.

To sum up, then, we find that, on a sheet of paper four feet by one foot six inches, we have a photographic image formed by a deposit of organic matter thrown down by the fifty-four and a half grains of silver, plus one grain of metallic silver obtained from the remaining one and a half grains of silver nitrate; and I ask, have we ever thoroughly realised what functions this organic matter must have in regard to the permanence of the image in our photographic prints? We seem to have nearly overlooked its importance altogether, and thought only of the chemical action of sulphur, &c., on the atoms of silver bound up with it.

I do not mean that these atoms of silver are not dispersed equally throughout the film, only that they themselves do not give the density of deposit. Even if they are converted into sulphide of silver, can they make much difference in the density of such deposit, seeing that they have only come from one thirty-sixth of the silver nitrate used, the

remaining thirty-five thirty-sixths being required to deposit organic matter, and are afterwards taken from the film altogether?

Of course it is in regard to the toning of the images, and the permanence of the deposit when exposed to the destructive action of sulphur, &c., that the importance of this organic matter comes into question, and here is opened up a vast new field of investigation.

The first thing to find out in this inquiry is, what agents cause injury to this deposit of organic matter, how they act upon it, and how their destructive action can best be prevented.

Experience has taught us that what we most have to contend against is the minute traces of sulphuretted hydrogen in the atmosphere, the destructive action of which is hastened by the presence of damp or acids.

Further, it is evident that the action of the sulphuretted hydrogen is to destroy, *by a kind of bleaching action*, the deposit of organic matter, and what is left behind in a thoroughly faded print is little more than the small trace of metallic silver converted into a sulphide.

We also know that, if we deposit gold or platinum upon the image, the destructive action of the sulphur is, to an extent, stayed.

I do not think that the toning by gold prevents the formation of sulphide of silver in the image, neither does it appear to prevent the removal of the silver from the film in the hypo bath. It seems rather that it retards the organic matter being bleached by the sulphuretted hydrgen. And it is evident that it is far more important to find something that will prevent this altogether than to trouble about the chemical change that may take place in the atoms of the one grain of silver dispersed throughout the blackened film on the surface of six square feet of paper.

I wonder how much silver there is in the film of a washed-out-looking print obtained from a thin, overexposed, quarter-plate negative?

HERBERT S. STARNES.

CENTRAL PHOTOGRAPHIC CLUB.

THIS Club was instituted in 1893 for the purpose of affording opportunities for social intercourse between all who are interested in photography, without distinction.

The rooms at the address—13, Henrietta-street, W.C.—are open every day from eleven a.m. to eleven p.m., for the use of members, and comprise general room (where smoking is allowed), library, and excellently fitted dark room. The principal English and foreign photographic journals are taken, and the members of the Club have a special tariff for refreshments. An exhibition of members' work is always on view, frequent changes being made. Members have the privilege of introducing a friend at any time.

Social and technical meetings are held every Friday evening during the session from September to May. These meetings take place in a large room in the hotel, the ordinary club rooms not being interfered with, so that those members who do not desire to attend these meetings can still use the club rooms as upon any other day. Country members will find the Club a very convenient centre for the transaction of business or meeting their friends, and it also gives them a place for the receipt and conduct of correspondence, full materials for that purpose being provided.

Private lavatory accommodation is provided for the use of members.

An attendant is always in charge of the club rooms.

The following gentlemen have kindly consented to act as "members in charge" of the club room on certain evenings in the month, the dates of which will be announced in the photographic journals week by week:—Messrs. T. Fall, Horsley Hinton, G. H. James, J. H. Avery, H. Snowden Ward, E. J. Wall, W. Allport, F. T. Carter, J. W. Hunter, and W. Ethelbert Henry. Other gentlemen are invited to send in their names. The Secretaries are always in attendance on Friday evenings.

The subscriptions for town members is 21*s*., and for country members 10*s*. 6*d*. annually, the same being due and payable on October 1. Life members are admitted upon payment of ten years' subscriptions. The Hon. Treasurer is Mr. F. T. Carter, to whom subscriptions should be sent. Full information regarding the Club will be given upon application to the Hon. Secretaries.

The following is the programme for the winter:—September 24, Instruction Evening: *Camera Manipulation*, Mr. John H. Avery. 28, *The Lantern Microscope and Apparatus for Photo-micrography*, Mr. R. G. Mason. Auditors to be appointed. October 1, Instruction Evening: *Exposure*, Mr. Alfred W. Dollond. 5, Annual Meeting. 6, Visit, by kind permission to Mr. W. Wray's Optical Works. Meet at Laurel House, North Hill, Highgate, at three p.m. 6, Last day for receiving pictures for the Salon and R.P.S.G.B. Rejected Exhibition. 8, Special Night: *Exhibitions and Exhibitors, with particular note concerning present Exhibitions*, Mr. A. H. Wall. 10, Instruction Evening: *The Preparation of Solutions*, Mr. E. J. Wall. 12, Open Evening. 13, *Conversazione*. Opening of the Salon, and R.P.S.G.B. Rejected Exhibition. 15, Instruction Exhibition: *Development*, Mr. John H. Avery. 19, *The Peak of Derbyshire* (with lantern illustrations), Mr. R. Keene. 22, Instruction Evening: *Intensification and Reduction*, Mr. W. Ethelbert Henry. 26, *Black and White; or the Preparation of Illustrations for Photo-reproduction*. Mr. Horsley Hinton. 29, Instruction Evening: *The Preparation of Negatives for Printing*, Mr. Edward Dunmore. November 2, *Precious Stones* (with lantern illustrations), Mr. T. C. Hepworth. 5, Instruction Evening: *Carbon Printing*, Mr. John H. Avery. 9, *Windsor Castle in the Jubilee Year* (with lantern illustrations), Mr. W. Brooks. 12, Instruction Evening: *Bromide Printing*, Mr. G. H. James. 16, *The Photographic Convention of* 1892 *and* 1894 (with lantern illustrations), Mrs. Catherine Weed Ward. 19, Instruction Evening: *Modifying Bromide Prints by After-treatment*, Mr. W. Ethelbert Henry. 23, *The Life Model* (with lantern illustrations), Mr. Gleeson White. 26, Instruction Evening: *Lantern Slides*, Mr. C. H. Oakden. 30, Demonstration: *The Exposure, Development, and Toning of Bromide Opals*. Mr. W. Ethelbert Henry. December 7, Demonstration: *The Toning and Finishing of Prints in Large Quantities*, Mr. Thomas Fall. 14, Open Evening. 17, Instruction Evening: *Elementary Photo-micrography*, Mr. C. H. Oakden.

The Instruction Evenings are intended for beginners, and will be of a strictly practical nature, and informal.

Members may introduce friends to the meeting either personally or by ticket, which may be obtained from the Secretaries. The meetings of this Club commence at eight p.m., and members are politely asked to remember this.

The programme for the new year will be published in due course. Amongst the arrangements are a valuable paper by M. Leon Vidal; Lectures from the Rev. Dr. Landsdell, Dr. Lindsay Johnson, and Mr. E. J. Wall; Demonstrations by Mr. W. Brooks; and Lantern Evenings from Mr. Paul Lange, from Mr. H. Snowden Ward (on *To Chicago and Back*, illustrated by slides), from Mr. W. H. Rau, Official Photographer to the Pennsylvania Railroad.

A TOWER BRIDGE GROUP.

PHOTOGRAPHY played a busy part at the opening of the Tower Bridge; the ceremony and its incidents, the scenes on the river and its banks, and the bridge itself affording opportunities for camera work to several hundreds of photographers on the memorable 30th of June. Photographic mementoes of the occasion therefore abound in great variety.

The London Stereoscopic Company, Cheapside, have secured what in all probability will be generally regarded as one of the most interesting photographic souvenirs of the opening of the bridge. This represents a group of about 130 royal and distinguished personages. The moment selected for taking the picture was that at which the address to the Prince of Wales was being read by the Recorder. This ceremony took place in a canvas tent temporarily erected on the bridge, so that the difficulties attending the exposure were great. Nothwithstanding this, a highly successful result has been secured.

Besides the Prince of Wales, the Princess, the Dukes of York, Cambridge, and Connaught, the Duke and Duchess of Teck, and many other members of the royal family, a large number of noble, distinguished, civic, and ecclesiastical guests figure in the picture, which is crowded with "speaking likenesses" of the assembled company. It is to be issued of the size 24 × 18, handsomely framed, and it will form not only an excellent work of art, but also an exquisite photographic souvenir of an event memorable in the annals of the City. Needless to say that the picture is printed, in platinotype, in the Company's usual finished style.

Our Editorial Table.

LUMIERE'S PANCHROMATIC PLATES.

Fuerst Bros., 17, Philpot-lane, London, E.C.

EVERY one who has studied the subject of orthochromatising plates knows that by the skilful selection of the agent they can be rendered sensitive to certain sets of colours. Lumière, however, has gone a step farther, and a sample of his "Panchromatic" plates, sent us by Messrs. Fuerst, have been so prepared as to be sensitive to red, yellow, and green. The trials we gave these plates substantiate the claims made on their behalf. But here arises the question: Seeing that they are sensitive simultaneously to red as well as to yellow and green, by what manner of light are they to be manipulated? We followed the sound advice given us by Messrs. Fuerst, and did so in a light so very subdued that we may be said to have transferred them to and from the dark slide by feeling, while for developing we covered up the bath in which this was done, and allowed them to remain for a period which we had ascertained by previous experiment to be correct. But there is no real difficulty to be experienced in their development, for after one has remained in the dark room for ten or fifteen minutes the eyes acquire powers of observation sufficient to permit of watching the progress of development with a certain amount of ease, more especially if the light is very subdued and the developing dish is kept covered until the details are believed to be rendered visible. A yellow screen can be used with these plates if preferred. They are very sensitive.

Convention Pictures.

By J. Brier, Macclesfield.

In the records of the late Dublin Convention mention was made of a cutter yacht built for and sailed by one of the members, Mr. J. Brier, of Macclesfield. Its owner has favoured us with some pictures of his pretty little vessel *Murre*, in which her charming figure is displayed both lying peacefully at anchor and also when under full sail. A view of *Ireland's Eye* accompanies them. They are all printed in platinum, and attest the skill of the artist both in technique and pictorial art.

The Velox Developer, Improved.

By Cadett & Neall.

This developer has only as yet been in the hands of the public for a brief period. Mr. Cadett has, however, subjected it to some modification, whereby its energy in developing a latent image has been considerably intensified. In what this modification consists we know not, it is to the result that photographers look; and in the dark weather, now so soon to be upon us, everything that conduces to shortening the exposure in the camera will be specially valued.

The Strand Magazine and the Picture Magazine.

George Newnes, Limited.

Mrs. E. Main is the artist selected this month for supplying the fine-art photographs for the September issue of the *Picture Magazine*. Of these there are six choice examples, all being snow scenes in the Engadine and other Swiss localities. These alone are worth much more than the price (6*d.*) for which the magazine sells. But besides these there are also a large collection of portraits of "Coming Rulers," headed appropriately by the Prince and Princess of Wales, old prints and pictures, pictures of places, miscellaneous pictures, and comic pictures.

The portraits of celebrities in the *Strand Magazine*, taken at different times of their lives, are the Rev. and Hon. E. Carr-Glyn, the Crown Prince and Princess of Denmark, and the Maharajah Gaekwar of Baroda. *Apropos* of an article, "The Likenesses of Shakespeare," by Alexander Cargill, we find no fewer than sixteen of them, each differing from the other, although a vein of similarity runs through all of them.

Ireland in the Magic Lantern.

This is the title of a lantern reading prepared for and sent to us by W. Laurence, of Dublin, to illustrate or, more correctly, to accompany, certain slides illustrative of the Lakes of Killarney and Glengariff *viâ* Cork and Bantry. There appear to be no fewer than eighty-seven views in this set, which will, doubtless, prove all that is claimed for them.

Primus Photographic Specialities.

Butcher & Son, Blackheath, S.E.

This catalogue is accompanied by a specimen of the "Primus" patent printing frame. The framework of this is made of metal, with a stout rim round the outside, which keeps it quite rigid. The springs are made of brass, and fold on hinges straight over the negative. They are wide enough to form the whole of the back of the frame. The price for quarter-plate is 9*d.*

The catalogue embraces the Primus camera, which, say the compilers, is not a toy that can be worked by simply pressing the button, but is designed for the person who has, or wishes to have, a knowledge of photography. Instructions are given for setting up and using this camera. It also contains various things interesting to the lantern specialist, among which may be noted cover glasses containing clouds.

Lumière's Citos Matte P.O.P.

Messrs. Fuerst Brothers, of Philpot Lane, have sent us a a sample of this new paper, which we hope to have an early opportunity of trying. For developing the partly printed image, the following developer is recommended: Immerse, without washing, in

Water	8½ ounces (fluid.
Pyrogallic acid	15 grains.
Acetic acid	a few drops.

Little by little the proof will gain in density, and, as soon as the density is considered sufficient, the proof is treated the same as the ordinary Citos paper, by combined or separate toning and fixing.

Queen Films.

By Austin Edwards, Willoughby-lane, Park, Tottenham.

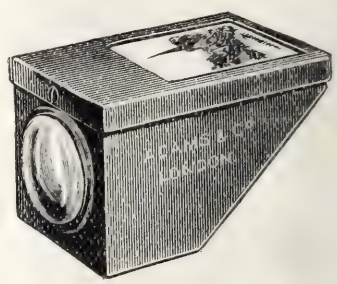
In the preparation of his films Mr. Austin Edwards has brought to bear the great experience he had acquired elsewhere previous to his commencing business on his own account. We have given a thorough trial to a sample received from him, and have been much pleased with the quality of the negatives obtained. Indeed we cannot desire anything better as regards gradation and general pluck. They are made in three degrees of sensitiveness and in every size.

Messrs. Whittaker & Co., of Paternoster-square, favour us with the *Programme of Technological Examinations*, including regulations for the registration and inspection of classes in technology and manual training to be held under the auspices of the City and Guilds of London Institute, for the session 1894–5. In a recent issue we made extracts relating to the photographic department. The book, which is published at 10*d.* net, should be in the hands of those who intend to sit for examination in any of the numerous branches of technology.

A Double Refracting Finder.

By Adams & Co.

Not double refracting in the sense understood in the polarisation of light, but rather a finder, having two refracting lenses. This finder is different in its optical construction from any other. There is no



ground glass about it. An image is formed by a convex lens, and this is directed at a right angle by a mirror, covered by another, and somewhat powerful convex lens, which forms an eyepiece. The result of this arrangement gives a finder having an exceeding degree of luminosity. In fact, it need not be shaded from the direct beams of the sun at all. Some idea of its exterior may be had from the cut.

News and Notes.

Messrs. Harley & Houser have removed from Chicago to 455, South Spring-street, Los Angeles, Cal., where they have a store and free dark room for the use of their customers.

Royal Photographic Society.—Technical Meeting, Tuesday, September 25, 8 p.m., at the Gallery, 5A, Pall Mall East. Explanation of the apparatus in the Exhibition by the exhibitors.

The Photographic Exhibition.—Lantern arrangements for the week.—Monday, September 24, Slides sent in for competition, also some by Mr. W. Scorer. Wednesday, September 26, by Miss Moysey, Mr. Carpenter, and Mr. Hankins. Saturday, September 29, *Around the Roman Campagna*, by Mr. G. E. Thompson (of Liverpool).

"A Bull" (?)—"Fuzzy-focus" writes: "Have you been in Ireland lately? Last two lines in par, 'Protecting Unfixed Negatives from Fog,' p. 582, is a good 'bull,' and well worth the price of the B. J. of P. this week. Not often you give us an Irishism." [Shade of Lincoln! Fancy a paraphrase of your famous saying being termed an "Irish" bull! What next?]

Playing it Low Down.—A Colchester photographer issues a handbill *àpropos* of the alleged recent murder by a photographer, which runs as follows:—"The Colchester Murder! The murder of the Photographic Profession in Colchester has commenced! Avail yourself of the offers while the opportunity lasts. 12 Midgets (two positions), 1*s.*; 12 *Cartes-de-Visite*, 2*s.* 6*d.*; 12 Cabinets, 5*s.* You should see specimens of our New Englossed Portraits! Weekly payments taken. No extra charge made for children."

A Record.—A correspondent writes: "The district of Reading is getting quite noted for octogenarian activity. We have one gentleman, upwards of eighty-five years of age, that bathes all the year round breaking the ice if

INTERNATIONAL
PRIZE COMPETITION.

For Professional Photographers only.

£200
STERLING.

JUDGES:—

MESSRS.

HAROLD BAKER (Birmingham).

W. J. BYRNE (Richmond).

THOMAS FALL (London).

— THE —

CADETT
PLATE

HOME SALE—SECOND TO NONE.

Any Professional Photographer in Great Britain and Ireland who has not received the Conditions, &c., of the above Competition, is requested to send a Post Card for the same, which will be forwarded post free.

☞ The Latest Date for Receipt of Prints for the **AMATEUR** Competition is the 30th instant.

CADETT & NEALL, ASHTEAD, SURREY.

A Professional Opinion

OF

ELLIOTT & SON'S

CARBON

ENLARGEMENTS.

(COPY.) "*Royal Marina Studio, Bognor, Sept.* 13, 1894.

"*Messrs. Elliott & Son,*

"*Gentlemen,—The Sepia Carbon Panel Enlargements safe to hand yesterday. I must say I am highly pleased with them; they are simply charming. The effect of the Sepia tint on the rough toned paper, with clean margins round the picture, is all that can be desired, and I must thank you for the pains you have taken in producing such effective and successful results.*

"*Please make a note on the negative that further copies may be printed in exactly the same manner.*

"*Yours faithfully,* (*Signed*) *W. P. MARSH.*"

(NOTE.—The colour referred to as Sepia by Mr. Marsh is our new colour, Barnet Brown.)

BARNET PHOTOGRAPHIC WORKS,

BARNET, HERTS.

necessary. But even this has been beaten, as far as age is concerned, by a youngster of eighty-seven, living at Burghfield, near Reading, entering the ranks of amateur photography. Mr. H. Lewis (of Danns, Reading) supplied him with an up-to-date outfit, which, of course, includes a T. P. shutter for instantaneous work. From a photographic view, "better late than never;" but what will the "Call to Arms" men think of this? Beg pardon, Mr. Editor, that discussion is closed.

American Weather Reporting.—With 3000 voluntary observers taking observations of temperature and rainfall, says the *Times*, and recording miscellaneous meteorological phenomena, it is now possible to supply, through the National Weather Service, climatological information for almost every county in the United States. Nearly every county in that country is provided with a station equipped with instruments of the Government standards. Should the work of establishing new stations proceed during the next two years at the same rate as during the past two, there will not be a county in the States that will not have a meteorological station. More than 10,000 correspondents are, it appears, at present co-operating with the National Weather Service through the State organizations; 3000 voluntary observers are furnishing monthly reports of daily observations of temperature and rainfall; and over 11,000 persons assist in the work of distributing the weather orecasts of the National Weather Service.

The Leytonstone Camera Club's third annual Exhibition and Competition will be held at the Masonic Hall, High-road, Leytonstone, on Thursday and Friday, November 29 and 30, and Saturday, December 1, 1894. The Judges will be Messrs. Bernard Alfieri, A. Horsley Hinton, and Andrew Pringle. Twenty-three medals, one gold, eleven silver, eleven bronze, are offered for competition in the following classes:—Members' Classes: A. Landscapes and seascapes, silver and bronze; B. Architecture (interior and exterior), silver and bronze; C. Portraiture and figure study, including animals, silver and bronze; D. Enlargements (which must be accompanied by a print from original negative), silver and bronze; E. Instantaneous and hand-camera work, silver and bronze; F. Lantern slides (set of six), silver and bronze. Open Classes: G. Special champion class (for pictures that have already received awards), in which a gold, silver, and bronze medals are offered; H. Prints of all kinds by any process; J. Lantern slides (set of six). A silver medal will be given for the most useful novelty in apparatus sent in for exhibition. There will be no entry fee in this class, but exhibitors will be expected to advertise in the official catalogue. Extra entry forms and all further information can be obtained from Messrs. Fred. W. Wates and George H. Cricks, Hon. Secretaries, "Rockcliffe," Bulwer-road, Leytonstone.

The following are the particulars of the International Prize Competition for Professional Photographers only, in which Messrs. Cadett & Neall are offering 200*l.* in prizes—first prize, 100*l.*; second prize, 50*l.*; third prize, 25*l.*; and five of 5*l.* Conditions:—1. Negatives to be taken solely on "Cadett" plates. 2. All prints to be mounted, without name and address; only one from each competitor to be sent, which is to become the property of Cadett & Neall. 3. Size of plate to be not smaller than $6\frac{1}{2} \times 4\frac{3}{4}$ (or 12×16 cm). 4. Any kind of printing paper to be used. 5. The work to be entirely that of the competitor or his *employé*. 6. Only photographers owning or renting a studio will be eligible. 7. Amateurs not eligible. 8. No *employé* will be eligible if his employer competes. 9. Any *employé* of a photographer desiring to compete will only become eligible by consent of his employer, and the negative must be taken in the studio of his employer. 10. In the event of an *employé* competing, the entry form must be countersigned by the employer. 11. All prints to be carefully packed and sent, carriage paid, to Cadett & Neall, Ashtead, Surrey, England. 12. Entries close on, and the latest date for receiving prints is, June 30, 1895. 13. Judges' decision will be announced in the English weekly photographic journals by July 31, 1895. 14. The Judges or their *employés* will not be eligible (except for exhibition purposes). 15. An arrangement will probably be made to publicly exhibit, after the awards, any selected prints, in which case the name, &c., of the competitor will be published. 16. An inquiry will be made (if deemed necessary) as to the winners being *bonâ fide* professional photographers before the distribution of the awards. The Judges are Messrs. Harold Baker (Birmingham), W. J. Byrne (Richmond), and Thos. Fall (London).

Messrs. Fuerst Bros., of 17. Philpot-lane, announce the following Money Prize Competition for United Kingdom, Great Britain and Colonies, open to Lumière's or any English commercial plates. Subject, reproduction of one chromolithograph and one coloured plate (supplied by us):—1st prize, 25*l.*; 2nd prize, 15*l.*; 3rd prize, 10*l.* (if the prizes are gained with Lumière's plates). 1st prize, 20*l.*; 2nd prize, 10*l.*; 3rd prize, 5*l.* (if the prizes are gained with English commercial plates). Conditions: 1. The following particulars to be clearly stated on a form to be sent to each competitor (on application), otherwise disqualification will ensue: (*a*) Name and address of dealer from whom plates were bought; (*b*) batch number; (*c*) full description of plates; (*d*) if screen used or not, and what kind of screen; (*e*) what developer used; (*f*) full particulars of treatment. 2. Negatives of the three winning competitors to become the property of Fuerst Bros. 3. Negatives only will be judged, and not more than one negative of each subject to compete, unless one is on a Lumière plate, in which case not more than two negatives of each subject are admissible. 4. A mounted print is required with each negative as a guide. Such print can be made by any silver printing-out process (state what paper used). The prints will become the property of Fuerst Bros. 5. The size of plate to be not smaller than half-plate ($6\frac{1}{2} \times 4\frac{3}{4}$). 6. All negatives and prints to be carefully packed, and to be sent carriage paid to Fuerst Bros., 17, Philpot-lane, London, E.C., by November 30, 1894, at latest. 7. Entries close November 24, 1894. 8. Exhibits are to be designated by a *nom-de-plume*, and to be accompanied by entry form, coupon, and a sealed envelope containing competitor's name and address. 9. The decision of the Judges will be announced in the weekly photographic journals, and will be final. 10. Judges: Capt. W. de W. Abney, C.B., R.E., F.R.S., P.R.A.S.; Mr. C. H. Bothamley, F.I.C., F.C.S.; Mr. Andrew Pringle, F.R.M.S.

The Identification of Criminals.—I must devote a few lines to congratulating Scotland-yard upon its enlightenment in accepting the Bertillon system of identifying criminals, *i.e.*, identification by the measurement of certain unvarying portions of the bodily structure. I was never so struck with the inefficiency of the old system as when visiting the inmost recesses of Scotland-yard by official invitation a few years ago. I found a score of detectives pouring over albums of photographs and registers of distinctive marks upon criminals in the hope of tracing the criminal pedigree of some offenders whom they had in hand. How uncertain photographs may be as a means of detection I need not say; every family has experience of them either in flattering or unflattering sense. Last night I was shown a photograph of Miss Kate Rorke, the actress, with the request that I should say who it was, and, although I happen to know the lady very well on the stage, I was quite unable to identify her "counterfeit presentment." So much for the trump card of the Criminal Investigation Department, old style! But, of course, photography was supplemented by the system of a register of body marks, which I investigated also at Scotland-yard. Excellent in theory! Only, unfortunately, many criminals have no body marks that are really distinctive. The departmental committee of inquiry into the identification business records a case where a minute red spot under the eye was the only distinctive mark given. Again, many marks, though definite enough in themselves, are shared by a great number of convicts. In the register for 1892, in the division "left hand," under the head tattoo marks, no fewer than twenty-eight persons are entered as having a ring on the second finger, and in only three of these cases is a second distinctive mark added. Names, of course, count for nothing, though I have no doubt that, if a psychologist presided over the Identification Department of Scotland-yard, he would find on the part of certain criminals a tendency to use certain names, without rhyme or reason. How loosely the present system works is shown by the fact that, whereas in Liverpool, Birmingham, and Bradford no fewer than seventy-nine per cent. of the criminals tried are recognised as old offenders, in London, where the number of persons to be dealt with is so much greater, and where identification is consequently so much more difficult, the proportion is only forty-seven per cent. As it is impossible to suppose that the proportion of habitual criminals in London is smaller than in the other places named, it would seem that, through the faultiness of the old system of identification, over thirty per cent. of criminals fail to be recognised as the old offenders that they are, and consequently miss the heavier punishment which is justly theirs. It will be some time, of course, before the Bertillon system exercises much practical effect, but the Scotland-yard authorities are entitled to the credit of making an excellent departure from their system of official routine.—*Referee*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
24	Central Photographic Club	*Camera Manipulation.* John H. Avery.
24	East London	*Retouching.* J. H Gear.
24	North Middlesex	*Photography and the Printing Press.* A. J. Johnson.
25	Birmingham Photo. Society	
25	Hackney	*The Hand Camera.* Walter D. Welford.
25	Halifax Camera Club	
25	Lancaster	
25	Leith	
25	Paisley	
25	Rochester	
25	Royal Photographic Society	Explanation of the Apparatus in the Exhibition by the exhibitors.
25	Warrington	
25	West London	
26	Burnley	
26	Croydon Camera Club	Exc.: Deepdene. Leader, The President.
26	Leytonstone	
26	Photographic Club	
26	Southport	
27	Glossop Dale	
27	Halifax Photo. Club	
27	Hull	
27	Liverpool Amateur	
27	London and Provincial	Open Evening.
27	Oldham	
28	Cardiff	
28	Central Photographic Club	*The Lantern Microscope and Apparatus for Photo-micrography.* R. G. Mason.
28	Croydon Microscopical	
28	Holborn	
28	Maidstone	
28	Swansea	
29	Hull	
29	Leytonstone	Excursion: Wanstead Park. Leader, Dr. W. Pickett Turner.
29	London and Provincial	Last Outing to Hampstead.
29	Photographic Club	Last Outing to Hampstead.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 13,—Mr. A. L. Henderson in the chair.

The Hon. Secretary read a communication from the Mayor of Rye, asking for subscriptions towards a fund for preserving some old buildings in that town that were threatened with destruction.

The Hon. Secretary stated that the Photographic Club's last outing of the season would take place on Saturday, September 29, to Hampstead Heath, and that the Association would join the Club on that occasion.

The question having been raised at a previous meeting as to whether the zenotype process was a stable one, the Hon. Secretary undertook to make some experiments to test the point.

Mr. CLAUD S. SCOTT showed a printing-frame of his own invention, to be used for contact work, lantern-plate and quarter-plate sizes. The frame has certain adjustments by which, if the lines in the negative are not square with the sides of the plate, they may be corrected in the frame. Mr. Scott also explained that, by the use of a scale, the frame enabled one to print from exactly the same part of a negative at different times. The back of the frame was perfectly light-tight, and the front was chamfered off, so as to give a perfectly sharp line round the positive image.

A DAY AT WINCHESTER.

Mr. SCOTT subsequently gave a lantern lecture illustrative of a day at Winchester, showing a large number of slides depicting the principal parts of this interesting old town. The slides were accompanied by a running account of the archæological and historical features of the views shown. At its conclusion, Mr. Scott was thanked for his lecture.

PHOTOGRAPHIC CLUB.

SEPTEMBER 12,—Mr. H. Wilmer in the chair.

Mr. Sinclair showed what he claimed was an entirely new finder for a hand camera. It was made in two forms, one for insertion within the body and the other for outside. On the "outside" pattern was fitted a revolving mask, showing the vertical and horizontal views.

Mr. BEDDING, referring to the Annual Outing to Hampstead Heath on September 29, formally proposed that, as usual, the London and Provincial Photographic Association be invited.

Mr. COWAN seconded, and the resolution was unanimously carried.

Central Club.—The opening meeting of the second year of this Club took place on the 7th inst., when Mr. D. S. BREARLEY gave a most interesting lecture on *Japan and the Japanese*, Mr. E. J. Wall in the chair. The lecture was illustrated by a series of 120 beautifully coloured photographic slides, which were entirely the work of Japanese artists. Mr. Brearley, before showing the slides, referred to the interest Japan has excited since the opening of her ports to the outside world, her eventful history, and the crises and sensational vicissitudes through which the country has passed. Allusion was made to the earthquakes, which are of daily occurrence, and the disastrous typhoons liable to occur during the year, and committing such havoc both on sea and land. Her climate, sunny and enjoyable autumn, bright blue sky; her exquisite scenery, her curios, knick-knacks, *netsukies*, and wealth of *kinbeloterie*; Japan's attitude in reference to missionary labour, sceptical but willing to listen to the preaching of Christianity from the lips of judicious advocates; her fabulous origin, long and unbroken dynasty, ancient civilisation, the partial adoption amongst the people of foreign dress and manners were passed in rapid review, and a contrast drawn between old and modern Japan. This was followed by a more detailed account of the people generally, which included reference to their amiability, supposed cleanliness, numerous bath-houses, dwellings, methods of locomotion in the mountains, the hairdresser, straw-coated coolie, plant and flower vendor, ambulant hawker, new year's greeting with its peculiar symbolism, the native boat (*sampau*) seldom sinking or capsizing, *geishas* or girl musicians, tea-houses, the industries of the country, the ceremony of *Hara-Kiri Samurai* in characteristic dress; whilst the two religions of the country—Shintorim, indigenous; Buddhism, introduced from China by way of Corea, with its gorgeous and costly temples; priests in full canonicals—all came in for notice by the lecturer, whose long residence in Japan and familiar knowledge of the people fully qualified him to speak with authority on such a subject, many being received with considerable applause, as the able lanternist of the evening committed the scenes to canvas. If a hearty vote of thanks, moved by the CHAIRMAN, and quickly seconded by Mr. R. BECKETT, and supported by Mr. ALLPORT, heartily endorsed by members of the audience, be any criterion, the lecture was thoroughly enjoyed.

North Middlesex Photographic Society.—Monday, September 10.—Prints on the sample sheets of carbon tissue supplied by Messrs. Elliott & Son were shown, and, for first attempts, were fairly successful, the general fault was a tendency to over-print, and the results were therefore more or less too dark. The Secretary produced a number of prints lent him by Messrs. Fuerst Brothers, showing the results of exposures made by Mr. A. Pringle on Lumière's ordinary and orthochromatic plates. They were photographs of a number of letters of different colours pasted on to a white ground, red letters on a black ground, and a chromo given with one of the Christmas numbers. The exposures were made on the ordinary plates, the Series A, orthochromatic (sensitive to yellow and green) and B Series (sensitive to yellow and red). The rendering of the colours was in some cases very peculiar and puzzling, the colour for which the particular plate used was supposed to be sensitive having scarcely any effect whatever, while in other cases the ordinary plate gave what was considered to be a better rendering of the colour values. A lively and interesting discussion took place, and samples of the three brands of plates were given to Messrs. Gregory, McIntosh, and Taylor, who undertook to experiment with them and produce their results at a future meeting. The St. Albans competition resulted in Messrs. Barrett and Allpress trying for first place.

South London Photographic Society.—At the last Ordinary Meeting, held at Hanover-park, Peckham, Mr. W. F. SLATER gave a demonstration on *Mounting and Framing-up*. For mounting photographs, starch was the best, and this the demonstrator, after damping some platinotypes, applied to their backs with the flat of the hand. The starch must be free from lumps. When glue is used for mounting, the print should be first trimmed, and then the glue applied along the edge, extending only about a quarter of an inch inwards. After being placed in position on the mount, the prints were damped with a sponge and then left to dry, and when dry the prints were free from bulges. One print (a toned platinotype) was mounted on an ordinary canvas stretcher, which was afterwards framed close up. The selection of tinted mounts required care, and a good idea of the effect was obtained by placing the prints on tinted boards. Smooth mounts should never be cleaned with bread, as it rubbed up the surface. A damp sponge was the best to use for smooth mounts, and indiarubber for rough mounts. When the sponge was used, the whole surface of the mount should be rubbed with it to avoid markings. The prints used by the demonstrator were afterwards framed up suitably by him, and the taste shown in the selection of the mouldings met with general approval. When the back of frame was covered with brown paper, the demonstrator deprecated the damping of it to make it taut, as the dampness was very liable to cause the mount to buckle.

Birmingham Photographic Society.—An important meeting of the members was held on the 12th inst., at the Exchange, the occasion being the presentation, by Sir J. B. Stone (the President), of the certificates and medals to those members who had gained them at the recent annual Exhibition. The PRESIDENT afterwards delivered an address, dealing mainly with his observations and experiences during his recent travels in South Africa. He expressed his appreciation of the courteous manner in which the Cape photographic societies had received him as representing the Birmingham Society, and of the excellent work they produced, for which, he considered, they deserved great credit, having regard to the disadvantages under which they worked, owing to adverse climatic influences on chemicals and paper. He also said they were very desirous to exchange slides with their friends in the old country, in which they naturally retained the keenest interest, as being the former home of themselves or their forefathers, and he commended the idea to the consideration of the home societies, as they would see very interesting and instructive work in exchange for their English scenes. He said he was also glad to observe many evidences of a desire on the part of the photographers whom he met to preserve records, and particularly ethnological records, of the history of South Africa, which was so rapidly developing and as rapidly changing under the advances of civilisation and commerce. He then referred to the particular object of his visit, viz., to see the Zulu people in their native home, whilst they preserved the forms of their native savage life in all their strength, grace, and physique, and before the effects of trade and missionary work made such a study impossible. He gave a lucid description of the method of administering the native code of laws, and of the curious results arising therefrom, dealing at some length with the subject of polygamy and the Zulus' custom of purchase of an unlimited number of wives with cattle. The lecturer stated his opinion that this system of polygamy, as practised by the natives, was the natural result of the consequences around them, owing to the exterminating influence of war amongst the men and the preponderance of women, and that it was regarded by the inhabitants as the greatest and most important principle among them, all social life in Zululand hanging upon it, so much so that even the beneficent influence of religion and morality, as taught by the missionaries, was not by any means as successful as they desired in attaining the object they had in view. He described, in humorous terms, the impression made upon him by an examination into the Kaffirs' method of eating and drinking, dress, sport, and the many native customs and traits of kraal life among them, of which he gave many interesting details, including the mode of travel by ox waggons and camping. In conclusion, the lecturer pointed out the great value of photography in obtaining and preserving lasting records of subjects such as he had seen and described. He regarded the matter of much ethnological importance, and as being worthy of the attention of the Government and of private societies, whilst he urged that it was the duty of all photographers who had the opportunity to assist, by individual effort, in preserving evidences of things which, in these days of rapid change and ever-varying scenes, would soon become matters of history. He himself had taken a large number of photographs during the tour, which it would be his pleasure on a future occasion to lay before the members, an announcement which was received with applause.

Darwen Photographic Association.—September 11.—Mr. GEORGE BUTTERWORTH exhibited a series of slides he had taken whilst touring on the Continent, which comprised some of the most picturesque views and ancient historical ruins of Germany and Switzerland, of the highest artistic qualities. He also gave his experience of mountain-climbing in Switzerland, and said that "any one wishing to accomplish these feats ought to serve a few years' apprenticeship as a Steeple Jack in England."

Longton and District Photographic Society.—September 6, Mr. T. Mottershead in the chair.—A paper was read by the HON. ASSISTANT-SECRETARY (Mr. G. Turner) on *Scholzig's Otto Paper*. The maker claims for this paper that it is easier to work, tones more evenly, and gives better results than many of the papers now on the market. Mr. Scholzig sent some very beautiful sample prints, which were much admired by the members. The CHAIRMAN kindly brought some untoned prints on Otto paper with him, which, after Mr. Turner had finished reading his paper, he proceeded to tone in a bath made according to Mr. Scholzig's formula. Some of the tones obtained were very fine, ranging from light brown to blue-black. Afterwards a short discussion took place, in which some useful hints were given and obtained. It was also proposed that an Exhibition be held in February next.

Liverpool Amateur Photographic Association.—This Society held another of their enjoyable excursions on Saturday, September 1, the place visited being Shortwick. In charming weather a large party left Woodside by wagonette at about two o'clock. There was not much time for photography, on account of the lateness of the season, though many good pictures were secured. A couple of groups were taken, and after tea, at the Greyhound Inn, the party returned, having had a delightful drive. Dr. J. W. Ellis acted as leader. On the previous Saturday also an outing took place, when Llangollen was visited and many capital pictures of Valle Crucis Abbey were obtained, despite wretched weather.

Stockport Photographic Society.—The Fifth Annual Meeting was held on September 12, 1894, the President, Mr. Thomas Kay, J.P., in the chair. The Hon. Secretary's report was read, and showed that the number of members at present on the books was 138. The meetings held during the year have been very well attended, and the Society is in a very flourishing condition. The Hon. Treasurer's report showed a balance in hand of 12*l*. The Council for the ensuing year were then elected as follows :—*President :* Thomas Kay, Esq., J.P. —*Vice-Presidents :* Colonel Turner, J.P., Messrs. E. F. Ward, and W. B. Leigh.—*Council :* Messrs. T. Bedford, H. N. Cooper, B. S. Harlow, George Hidderley, A. M. Gourley, W. A. Downham, H. L Overton, J. Lingard, O. Coppock, and J. W. Buckley.—*Hon. Treasurer :* Mr. W. T. Scott.—*Hon. Secretary :* Mr. Thomas Gould.

FORTHCOMING EXHIBITIONS.

1894.	
Sept. 21–Oct. 6	*Royal Aquarium.
,, 21	*Westbourne Park Institute. W. H. Brown, 51, Porchester-road, W.
,, 24–Nov. 14 ...	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1	*Stanley Show (Photographic Section).
,, 29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December.....	*South London Photographic Society. C. H. Oakden 51, Melbourne-grove, East Dulwich, S.E.
1895.	
March 25–30	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,181.—"Improvements in Laying a Grain on Metal Plates for Photographic Engraving." J. Addison.—*Dated September*, 1894.

No. 17,223.—"Improvements in Photographic Cameras." J. Ashford.—*Dated September*, 1894.

No. 17,264.—"An Improved Photographic Changing Box." S. J. Levi and A. J. Jones.—*Dated September*, 1894.

No. 17,362.—"Improvements in Effecting Photographic Exposures." C. D. Durnford.—*Dated September*, 1894.

No. 17,425.—"Photo-sculpture." H. H. H. Cameron.—*Dated September*, 1894.

No. 17,592.—"Improved Apparatus for the Production of Photographs upon Ferrotype and similar Plates." Communicated by R. Aramburu. Complete specification. H. J. Haddan.—*Dated September*, 1894.

PATENTS COMPLETED.

Improvements in Treating Photographic Prints and Apparatus therefor.

No. 19,718. Roderick James Fry, 15, Amhurst-park, Stamford-hill, and Howard Forester Knight, Oak Dene, Bush Hill-park, both in the county of Middlesex.—*August* 18, 1894.

This invention relates to a process for treating ordinary photographic prints so as to give them the appearance of having been printed on paper having a rough surface, such as is usually employed for water-colour drawings, or as if they were printed on canvas, cloth, or other textile fabric.

In carrying out our invention we take a photograph printed on paper having a smooth or matt surface in the ordinary manner. We take this print and submit it to the pressure of a plate or block having a surface so prepared as to impress or emboss the print so as to give it the required roughened surface. In practice we find it advantageous to first mount the print on a backing of waterproof paper and to submit it to the pressure of the embossing plate while still wet with the mountant.

One advantage of roughening the surface of the print after backing is that it can be more conveniently mounted on boards.

Our embossing plates or blocks are made of various sizes to suit the size of the print to be treated, and are adapted to be used with a hand press, such as an ordinary letter-copying press.

In some cases we may employ an upper and a lower plate or block serving as a die and matrix, but in practice we find that good results are obtained by using only one plate or block to serve as a die in combination with a suitable pad.

The claims are : 1. The described process for treating photographic prints, such process consisting in subjecting a photograph printed in the ordinary manner to the pressure of an embossed plate, so as to give a roughened surface to the photograph as and for the purpose described. 2. The use in treating photographic prints of plates or blocks having their surfaces so prepared as to give the prints a roughened surface substantially as described. 3. Photographic prints having roughened surfaces produced by the process hereinbefore described.

A Dissolving and Effect Slide-carrier for Use with a Single Magic Lantern.

No. 6518. Rev. Asheleigh Thorp, M.A., 42, Great Percy-street, London, W.C.—*August* 18, 1894.

A "carrier," enabling the operator, with a single magic lantern to superimpose a second picture on the screen before withdrawing the first—capable of being used with unframed or framed slides—thus producing "dissolving" and other "effects."

The contrivance consists of a frame fitted with spring or springs, and two movable slide-holders. The first inserted is pressed into focus by the spring or springs; the second is introduced behind, or before, the first; and on the first being withdrawn, the second is pressed into focus by the spring or springs. The end of the frame withdraws, so as to admit of the frame being used for similar action in the case of framed slides, whether "slipping" or ordinary.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is : 1. The construction and arrangement of a carrier for use with a magic lantern, substantially described as a dissolving and effect slide-carrier, consisting of a frame and two detached slide-holders. 2. The frame, capable of containing at the same time side by side, with the slide-openings in the rays of the lantern, the two holders, or one of the holders and a framed slide, or two framed slides. 3. The carrier-frame, fitted with a spring or springs which press upon the holders or framed slides while in the frame, and which, on the withdrawal of one holder or one framed slide, press the other into focus.

Improvements in Carriers for Optical Lanterns.

No. 15,824. Lambert Matthews, Strafford House, Hadley-green, Barnet, and William Watson, 35, Danbury-street, Islington.—*August* 18, 1894.

The improvement in carriers consists of making a frame into which the lantern slide is placed through an opening at the top of the said frame, and is kept in position by shaped pieces of metal or other substance fastened to a bar running across the bottom of the said frame.

The frame is open at the front the full width of the slide to be used, and the bar across the bottom has pins fastened thereto at right angles and bent in such a manner as to cause the said slide to be displaced when the aforesaid bar is turned by a milled head or lever passing through the frame to either or both sides. The bottom of the frame has a shoot fixed thereto, to allow the lantern slide to slip down and away, leaving the aforesaid frame clear to receive another slide, which is then passed through the opening at the top of the frame, and so on in continuation.

A New and Improved Compound for the Dry Copying Process for Producing Multiple Copies of Writings, Drawings, and other Delineations.

No. 19,404. William Wilson, 3, Great Avenham-street, Preston, Lancashire.—*August* 18, 1894.

The new and improved compound or mass upon which the negative is to be produced consists of glycerine, 5 parts; plaster of Paris, 2½ parts; gelatine, 1 part; and water, 2 parts; which, when set, presents a smooth surface, capable of receiving the colour or ink from the original writing, drawing, or other delineation requiring to be copied. The negative may be easily removed from the mass by simply washing it off with a sponge dipped in cold water.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it to be understood I do not confine myself to the precise quantities hereinbefore mentioned, but the quantities stated give good results, and I therefore claim : 1. The use and application of the mass, substantially as and for the purpose described. 2. A more durable and less wasting compound during removal of negative, owing to the introduction of plaster of Paris into the mass hereinbefore described.

Correspondence.

THE SALON AND R. P. S. G. B. "REJECTED EXHIBITION" AT THE CENTRAL CLUB.

To the Editor.

Sir,—Will you kindly notify in your Journal that we shall be glad to collect, free of all charges, any pictures that have been rejected by either of the above Exhibitions, whose owners may desire to show them at above Club. All that we require is the note issued by the Secretaries of the above respective Exhibitions, authorising the delivery of the pictures.

I am, yours, &c., C. H. Oakden.

13, *Henrietta-street, W.C.*

DEVELOPMENT, &c.

To the Editor.

Sir,—This is a letter of thanks—rather late, I know—but, fortunately we had a fine time all last week, and I was fully occupied.

I tried the combined developer, as you gave in the JOURNAL (August 24), and find it all you claim for it—a real boon for short exposures. My first one rushed up so quickly that it positively frightened me, so I at once slipped it into a dish of plain water, whilst I put a little more bromide in the developing glass and half a volume of water, using so much less of the original quantity, and replaced the plate in it. During the time it was in the plain water the development went on, and it finished off a fine negative.

Then, we in this agricultural district have had a wet summer and a very poor harvest, some weeks wet every day, which makes sitters scarce and cash more so. Therefore, at the end of one such week, it was a real godsend to read in the JOURNAL those letters of "Junius Junior." The fun and sense are splendid, we laugh upon every remembrance of it. When you have the opportunity, thank the gentleman for it and ask him to make some more. That is not far from the truth; plenty very like his pupil.

The great increase of photographers during the last ten years, with the fact that every one has pictures now, and does not want them repeated every year, causes us to be rather dull that way. Thirty years back few had them.—I am, yours, &c., WM. GIRLING.

Stradbroke, Suffolk, September 18, 1894.

PS.—There seems no end to talk, photographic, *re* the depression. I used to work for a neighbouring clergyman: now he has turned photographer; another has a son of seventeen or eighteen, and he does it; a third one has a daughter going that way. We are still on good terms; they show me badly developed pictures with such admiration that I cannot but smile. They confess they are not so good as mine, but they take servants, workpeople, &c., and diminish my work somewhat. No doubt others feel the same. W. G.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be*

CARLTON.—See reply to "A. M. Z." last week.

J. HUFF.—It means a saturated solution of the salt.

QUERIST.—M. Adam-Salomon died thirteen years ago at the age of sixty-three.

WALTER EDMUNDS.—Thanks for your suggestion. We had already decided on the course you name.

E. P. NIXON.—Add a few grains of citric acid to the ferrous-oxalate developer. This will cause it to work clean and good.

J. RANCE.—The rapidity of an emulsion depends as much upon the care exercised in its use as on the formula by which it is compounded.

R. ROSE.—The inequality in the drawing of the two heads may be accounted for by one having been printed from paper cut lengthwise and the other across the paper.

W. A. PARSONS says: "Would you let me know if you have any book on working up enlargements in black and white?"—We do not publish any such book, nor are we aware of any.

FOCUS.—Select by preference the lens having the longer focus of the two. It will include less subject on the plate, but what of that? It will still include more than enough for your purpose.

HORACE —A good iron developer may be made by mixing saturated solutions of protosulphate of iron and neutral oxalate of potash in the proportion of one of the former to four of the latter.

N. E. F.—Read up the series of articles on the wet-collodion process which we published in the JOURNAL last winter. Therein you will find instructions for working the ferrotype process.

PIRATES' VICTIM.—1. The address is London Chamber of Commerce, Botolph House, Eastcheap, E.C. 2. Masters, Lamb's Conduit-street, W.C., will, in all probability, supply your requirements.

J. H. S.—You can get your lac varnish to become bright by mixing with it a nearly equal bulk of powdered chalk, shaking well up, and after a gentle heat, allowing it to settle, then filtering.

TOVET asks: "Can you tell me where I should be likely to obtain slides of the Tower Bridge in process of construction and completed?"—Perhaps some of our readers can supply the information desired.

ANXIETY.—Your collodion is too thick. Add enough to it of a mixture of three parts of ether and one part of alcohol to impart the required fluidity, and take care not to leave the bottle uncovered again.

HARRY BROWN.—The first daily illustrated paper was started in New York in 1873, under the title of the *Daily Graphic*. As we have not heard of its present existence, it may be dead, but we cannot speak positively as to this.

SAM KING.—To make a matt surface on the glass, have a leaden or gutta-percha vessel, on the bottom of which sprinkle some crushed fluor spar, and then add a little sulphuric acid. Expose the glass to the fumes which will now arise.

COL.—The rapid rectilinear has been very extensively employed with success for purposes similar to what you require; but we have no doubt the others would serve the purpose equally well. We cannot speak from experience, however.

CYCLIST.—If you have a very good light, either of the lenses specified will serve your purpose, but, on the whole, we should give preference to a thoroughly good portrait lens—a large one, of course, especially for small groups in which babies formed a prominent feature.

R. W. WICKS says: "Can you give me a good formula for making a varnish for celluloid negative films and method of applying same?"—If our correspondent will refer to the JOURNAL for February 19, 1892, he will find that we deal very fully with the subject of suitable varnishes for film negatives.

PLATINO.—1. Mr. Dollond's process of toning platinum images by means of gold might suit your purpose. See the JOURNAL of April 6, 1894. 2. Pizzighelli and Hübl's book on *Platinotype*, obtainable of the Royal Photographic Society, 50, Great Russell-street, W.C., price (we believe) 2*s*.

T. ALDRED.—It does not follow that, because there are a vast number of deteriorated prints on gelatino-chloride paper, the process is at fault—that is, the paper itself. Although the combined toning and fixing bath may be simple and best with some papers, bear in mind that stability of the result is the prime factor, particularly with a professional photographer.

S. O. L.—The formula for collodio-bromide seems to be quite correct, and we cannot account for your results, except that it was not strictly adhered to, or, what is equally likely, an unsuitable variety of pyroxyline was used. However, in the first essay in any fresh process, success must not be expected at the first go-off. Three years' experience with ready-made gelatine plates will not help much when the plates have to be made by the worker himself, and by an entirely different process, and on totally different lines.

CANTAB.—1. The device shown at fig. 2, page 602, in the ALMANAC, permits of the images being simultaneously impressed side by side as required. Nachet's binocular (fig. 4) also does this. 2. Such apparatus is only at present made to order. Any working optician will undertake to make it. 3. For some subjects plates that are colour-correct (isochromatic) will prove best; for others the ordinary plates answer quite well. 4. Any good object-glass will do, but avoid the so-called French triplets.

HUNTINDON says: "Of late I have been much troubled with the silver solution; instead of draining off evenly, after the paper is sensitised, adhering as drops or tears as if the surface of the albumen was greasy. Can you tell me of a remedy?"—This trouble is sometimes met with when the surface of the albumen is very repellent, as it often is when it has a very high surface and is abnormally dry. A little alcohol in the solution will often prove a remedy, but the better way is to keep the paper in a slightly damp place for a few hours, so that it may absorb a little moisture before it is floated. If this fails, there is nothing left but to blot the paper off soon after it is removed from the silver solution.

R. CHAPMAN says: "I enclose herewith a small piece of a negative made on an isochromatic plate, medium rapidity, and which shows three clear spots of film, notwithstanding the liberal use of alkali to endeavour to bring out the detail. Developer was pyro and soda, but I cannot in any way account for the patches, and if you can throw any light on the subject I shall esteem it a favour. I have used the ordinary isochromatic plates for nearly two years, but have not seen such a defect before."—We should surmise that some drops of a liquid had been allowed to fall on the plate, and had the effect of rendering the patches insensitive. No other explanation that we can think of would meet the case.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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A NOVEL AND INVISIBLE KIND OF TRANSPARENCY.

Not novel in the true sense of the term, but certainly so as regards the knowledge of ninety-nine per cent. of photographers at the present time.

There is, too, a species of magic about it, for one can be handed a sheet of white paper with a challenge, as we have more than once given, to the observer to try if a picture can be seen upon it when viewed either by reflected or transmitted light. Nothing can be seen, and yet the picture is there, and can be made to appear and disappear. Seeing it may be made conducive both to the education of the inexperienced photographer and also to the amusement of his domestic circle, we propose giving such an account of the singularly easy method by which it can be made as to enable any one trying it to succeed.

It is based on the well-known fact that certain organic substances, like gelatine, starch, albumen, or gum, when exposed to light along with such bichromates as those of ammonia or potash, are rendered insoluble by the action of the oxide of chromium, which results from the decomposition of the bichromate by the light when in contact with the organic matter. The printing processes now dependent upon this action may be said to be almost innumerable.

Our invisible photograph is, as stated, one which depends upon the principle hinted at. So invisible is it, that on a sheet of paper, containing either the photograph of any natural scene or important private writing, a letter on any commonplace topic may be written without the least suspicion of anything more important than the surface visible writing being contained within the paper. The secret image comes into visibility only upon the application of the suitable reagent or developer, to fade away again into invisibility after a few minutes, but always ready for undergoing temporary restoration, even for many times.

Immerse a good quality of paper in a solution of soluble gelatine, twenty grains per ounce of water. Let this get absorbed into the paper, which then hang up to dry. When quite dry, float it for three or four minutes on a solution of bichromate of potash, made up in the proportion of one part of a saturated solution diluted with two parts of water. After being dried, the paper is ready for use, and it seems to keep well for a considerable period of time.

It is exposed in a printing frame under the negative until a brownish-coloured print appears visible, after which it is immersed in water until the unaltered bichromate is dissolved out.

When this has taken place, the next step is to remove the gelatine which has remained unaltered by the exposure, and which is still more or less soluble. This is done by treatment with warm water.

If the picture be now examined, it will be found to be but feebly visible and of a pale brown colour. It is evident that, to render it invisible, this colour must be discharged. Happily, this can be readily done by immersing the print in sulphurous acid, or in sulphuric acid diluted with an equal volume of water.

Under this treatment the visible image disappears so far as concerns its aspect by visual examination, although it is still existent in the paper. When washed, to remove the bleaching acid, and dried, the picture is finished. It can now neither be seen by being looked upon nor through.

When desired to be rendered visible, all that is requisite is its immersion for a few seconds in the hydroxyl monohydride of the *fin-de-siècle* chemist, the *aqua pura* of the pedant, or the common, plain water of the unsophisticated speaker of English. Held up to light, the transparency appears with a vigour proportionate to the nature and density of the paper upon which the print was made, for much, very much, depends upon the paper. Within the past fortnight we have obtained a sample of hard, dense, absorbent blotting-paper, which, to our thinking, proves better for the purpose than any other brand we have tried. An opaque paper, when examined by transmitted light and which becomes very translucent when made wet, is the best.

We have rendered plain writing-paper really excellent for this purpose by first removing the size with which it was prepared by a preliminary treatment with hydrochloric acid when laid flat on a glass plate or in the bottom of a flat dish. It need scarcely be said that this treatment weakens the paper very much. A weaker sizing with gelatine may advantageously follow in some cases.

The *rationale* of the process will be apparent. By the treatment specified certain portions of the paper are heavily charged with insoluble gelatine, and these act in contradistinction to the more absorbent portions, which become semi-transparent on immersion in water, and remain so until the water is dried up, when the differences in translucency disappear. This process was evolved from the early experiments of Poitevin by a literary gentleman, Mr. Stone, since deceased.

DRYING THE NEGATIVE.

Although the nominal summer is not yet passed, we have already had proof of the advent of the atmospheric conditions usually associated with the idea of autumn in the number of negatives badly marked through imperfect drying conditions. There is no secret in the fact that such markings may be produced during the drying of a negative; but, as it is little to be noticed in much landscape work, the matter receives far less attention than is justly due to it. The occasion when such defects render themselves unpleasantly prominent is when the subject embraces a comparatively large area of uniform tint, as, for example, with portrait negatives with plain or shaded backgrounds, or with architectural views with a large expanse of wall or window, especially when not cut up with clinging plants, trees, and the like. The effect is simply produced by a portion of the negative drying at a different rate from the rest, the result being a difference in density of the two portions. That this matter is not fully understood we are well assured, judging from the number of such stained negatives submitted to us for explanation as to the cause of the defects. During warm weather the average conditions of drying are sufficiently favourable to eliminate the probability of the occurrence; but the first time there is experience of a cold day with humid atmospheric conditions the danger sets in. A negative, after washing, is placed in a rack, or otherwise, to dry; during the night little progress will perhaps be made, but on the next day warm weather may supervene, the negative is brought out and placed in a more favourable position for drying, which is at once accelerated—consequence, a stain, visible or not, according to the subject. At this stage it may be pointed out that much depends upon the character of the film, some plates in the market drying under similar conditions in less than half the time required by others; hence, except on rare occasions, a photographer may use many dozens or grosses of plates without seeing a single stain so produced. To this extent our previous observations will not have a universal application.

This particular defect being thus brought to notice, and its cause emphasised, there follows the question, "How is it to be avoided?" Nothing but a general reply is possible, as the conditions under which the plates are placed govern the results to so great an extent. First, however, it may be said, that when a negative is set up to dry it must not be in a place where very great variations of temperature are probable. For example, we have seen instances of very strongly marked stains through the plate having been placed in a room in which the sun shone for a large part of the day. Dried round the edges only during the night, it happened that, when the solar beams traversed it the next morning, the plate became so warm that quick drying followed and a large patch resulted. It is, of course, very annoying to have to wait a whole day before being able to use a negative, but when the urgency is great there is no plan better than that so often described by us—soaking in methylated spirits. Correspondents have described how they have succeeded by attaching the plate to the fly-wheel of a sewing machine, and so forth. Such methods as these, however, are not for general use. When as much speed as is consistent with ordinary conditions is desired, the process will be much accelerated by wiping the back of the plate quite dry, and also removing all the superfluous moisture possible from the film by means of a soft linen cloth, free from fluff. A hard sample of blotting-paper may be used.

As to the actual modes of placing the negative during the drying, there is as great variety as there are conditions. The common mode of placing it on a shelf or table is the simplest, but it has many disadvantages. First, the draught of air is interfered with; and secondly, and more important, there is such a great liability to rear the plate *in situ* without first ensuring an entire absence of dust and dirt. If it be so placed, the dust is instantly shot over the whole surface of the plate by surface tension if the film have not been previously freed from surface moisture. Then, there are the well-known plate racks. These are very good for one or two plates; but, if there are so many to be dried that they need to be placed close together, the drying is greatly hindered, and stains rendered more probable.

Possibly, where circumstances permit it, the best method is to place the negatives upon a series of nails driven into a wall, the plates being arranged so as to lie horizontally, or to be suspended, as it were, between two closely arranged nails, so as to hang cornerwise. This permits the drainage to collect in one spot, and drop away. With regard to this plan, a difference of sixty or seventy per cent. in the rate of drying will be possible, according as to whether a current of air passes along the wall or not.

There is one final point to consider. Should the negatives be placed film outwards or to the wall? An old wet-plate worker would shudder at the bare idea of film side outwards; but, excepting from danger from persons passing by or injuring them, the gain in rapidity from this mode is so great that the majority are likely to prefer it. We would say, in conclusion, Use spirit when rapidity is needed, otherwise a fairly uniform temperature is all that is required to ensure complete absence of drying marks.

DENSITY OF IMAGE AND PERMANENCE IN POSITIVES.

In our last issue we published an article by Mr. Herbert S. Starnes under a somewhat similar title to that we have now chosen, in which the writer seems to have rather mixed up the two very different classes of image formed by development and "printing out." True, Mr. Starnes commences by speaking of the "image of a print," but he very shortly goes on to draw an analogy between that and another produced by development, and harks back to previous articles of his in which he claims to have shown that the density does not depend upon the quantity—amount, he calls it—of silver contained in the film.

The writer of the article then goes on to say that "we find the same law holds good in a printed-out image," but this is a dictum or a dogma with which we can in no way agree. Where do we "find it" either in theory or practice? It is quite correct to say that, under certain circumstances, a very dense image can be developed from a film that contains a very small proportion of silver. Mr. Starnes himself has published such a formula for dry plates, but the films so produced are of no real value at the present day, when rapidity and quality are expected to be combined in the same plate.

A film containing a fraction of a grain of silver on the area of a quarter-plate may, under specially favourable circumstances, give sufficient density, or even too much; but tested, say, for "snap-shot" purposes, or where delicacy and gradation are required, we think that the consensus of opinion will be against the thin plate. In the old albumen days, too, when

a rich black tone was required, it was not the custom to get it by reducing the strength of the silver bath, but rather the other way; a strongly salted paper was used, and sensitised on a silver bath of eighty or a hundred grains to the ounce, instead of the thirty-five or forty-grain baths that came into vogue when silver prints began to gain their reputation for fugacity.

Mr. Starnes, in fact, bases his arguments upon an utter fallacy, that the developed and the printed-out images are the same in character, and the term "metallic silver" seems to be the rock on which he has broken. In the case of the developed image, no doubt we may take it that the deposit is really metallic silver, mixed up, there is no question, with the organic matter composing the film, or vehicle in which it is held, but mixed only mechanically. Before development, there may or may not be a more or less close *chemical* relationship between the silver and the film, but after the developer has acted that relationship ceases, and, if the image then formed is not pure silver, the metal has certainly not any very close connexion with other matter. In the case of a printed-out image, however, we have very different circumstances to consider, and here the question of organics comes in in a more important manner, though we think Mr. Starnes entirely mistakes its function. He has mentioned instances of the effect of organic matter in the production of vigorous images, but seems to infer that it is the organic matter rather than the silver that produces, or rather forms, the image. If such were the case, how does it happen that a silver print—be it on albumen or gelatine paper, or, for the matter of that, collodio-chloride—may be bleached by any chlorising or bromising agent, and redeveloped to its original strength? We are not aware of any form of organic matter that is at once susceptible to the bleaching action of, say, chloride of copper and subsequent restoration to its original form or colour.

There is no denying the fact—for it is on that that the principle of "printing-out" papers is based — that organic matter forms a most important item in the formation of the image, though not, as Mr. Starnes seems to think, on its *constitution*. Organic matter, in fact, may be said to be the *developer* that brings about the reduction of the silver salts under the action of light. Take nitrate of silver, for instance; it may be exposed to light for a period of time without much change in colour, and that chiefly, if not solely, due to impurities; but spread it on paper, or expose it in contact with any sort of organic matter, and the change will be rapid and palpable. Pure chloride of silver too, especially in the dry state, is very little altered by exposure to light; but, if it be mixed with any sort of organic matter, the colouration will be very much increased.

The experiment quoted by Mr. Starnes of an emulsion of albumen and chloride of silver so absurdly "gives him away," to use a slang expression, that we are astonished he should mention it. The veriest tyro, the merest schoolboy knows that free silver is a necessity if vigour of image in a positive is required, and that albumenised paper owes its properties in that direction, not to the mere presence of silver chloride held in the albumen film, but to the combination of silver with the albumen, which coagulates it and, at the same time, forms a compound that has been called albumenate of silver, as well as the excess of silver nitrate left from the sensitising. Without the latter, even the combination of chloride and albumenate of silver will not give an image of any practical vigour, as Mr. Starnes may easily prove for himself if he has not already done so, by washing a sheet of paper, after sensitising, in order to free it from all excess of silver salts.

But, turning to the emulsion of chloride of silver in albumen that he has succeeded in making—we know not by what method, but there are half a dozen ways at least in which it can be done—the very fact of its being an emulsion precludes the possibility of its being any use for printing-out purposes. We have said a moment ago that the combination of albumenate of silver and free nitrate are a necessity in the case of albumen paper, and quite as much so in an albumen emulsion, were it a possibility; but, when the presence of free nitrate or the formation of albumenate of silver would certainly coagulate the albumen, it is difficult to see how a practical printing-out emulsion could be formed, or to imagine how Mr. Starnes could arrive at any better result than that he has discovered.

Chloride of silver may certainly be emulsified with albumen either by careful precipitation and subsequent mixture, or by emulsifying carbonate of silver and conversion by hydrochloric acid or a chloride; but in any case it is a rather difficult job, and not worth the trouble in view of the results obtainable. For printing out the emulsion is perfectly valueless, and for development the results are vastly inferior to either gelatine or collodion.

So far we have had nothing to say except in connexion with the formation of the image, but now we must turn to its composition, as defined by Mr. Starnes. According to him, the silver has practically nothing to do with the constitution of the image, though we are quite unable to follow him in his figures as to the quantities of silver required to sensitise, and contained in a sheet of paper. He mentions Professor Hardwich as his authority for the statement that a sheet of paper "blackened all over," and "passed through the hypo bath and washing waters," contained less than half a grain of silver. We have read most, if not all, of the late Mr. Hardwich's writings—and it must be remembered that he wrote on that subject, at least, in the days of strongly salted paper and strong silver baths—but we have no recollection of any such extraordinary results, and, from a very rough trial of spoilt *toned* prints representing the area of a sheet of paper, we have just got a considerably higher return than that; with more care, possibly a far higher one.

However, we come to the final result of Mr. Starnes's deductions, namely, that the image on a positive print consists—mainly at least—of a "deposit of organic matter thrown down by the silver." We admit that a very small quantity of silver, if properly used, will cover a very wide area, and, accepting Mr. Starnes's figures as to the quantity of the metal contained in an ordinary sheet of paper, it is just possible that that small "plating" may suffice to give the positive image a decent claim to the title of "silver." But we should like to know somewhat more definitely what is the nature of the "organic matter" that behaves in such a curiously inorganic manner in all the reactions that occur when a positive image is treated with solutions that are only supposed or intended to act upon silver.

A few weeks ago, when Mr. W. Bishop appealed in our columns for some authoritative decision on the question of the combined toning and fixing bath, Mr. Starnes was good enough to give us his views, and now again "Free Lance's" mention of Davanne and Girard has raised his recollections of some of their work in "the fifties." But the question at issue has yet to be threshed out thoroughly.

The 1895 Convention.—Mr. Martin J. Harding writes from Shrewsbury: "Just a line to let you know that our Executive Committee is formed, and already at work upon next year's excursion programme, and advancing matters generally as much as possible."

Forestalling.—One of the Glasgow newspapers, in its issue for Monday last week, the 17th inst., gave an account of the opening conversazione of the Photographic Exhibition of Saturday last, the 24th, with a list of names of many who were present. A list, if it includes the officers of the Society, is easy to forecast; but, in future, we would advise our northern contemporary not to be a week "too previous," but to wait for the event.

Another Large Telescope.—It is reported that the construction of an object-glass of extraordinary size is to be undertaken at the Jena factory for a telescope for the Berlin Exhibition of 1896. It is to be 110 centimetres (about forty-four inches) in diameter. This will break the record once more, and be the largest object-glass in the world, being many inches larger than the great Lick instrument. This, we think, is the first object-glass of abnormal dimensions that the Jena factory have undertaken, and astronomers as well as opticians will look forward with keen interest for the result.

Printing Processes.—One of the most interesting and instructive features of the catalogue of the Royal Photographic Society's Exhibition is the mention of the processes by which the exhibits are printed. It will be noted that a large proportion of the work of amateurs is in gelatino-chloride, while the majority of the professionals' work is either in carbon or platinum. It is certainly a healthy sign to find undoubtedly permanent processes being so extensively adopted by the leading men in the profession, many of whom, up till the last few years, have practically ignored them. This is the more surprising, seeing that by these unquestionably permanent processes, a greater variety of effects, tints and colours, can be obtained than by any of the more or less fugitive silver methods. Another noteworthy fact is that something like seventy-five per cent. of the pictures entered for sale are either carbon, platinotype, or mechanical prints. Hence the purchasers have a guarantee of the permanence of what they buy.

The Police and Photography.—Comment has frequently been made in these columns as to the comparatively small use made of photography by the Police authorities in this country, while in some others it is far more extensively utilised. However, there are increasing indications of its utility being more fully realised. During the trial in the great silver robbery case, when some seven or eight thousand ounces of silver were stolen, the Inspector of Police produced photographs of the strong room in which it was stored that showed the locks and appearances presented when the robbery was discovered. There is no question that photographs of this description would often prove most valuable evidence in many a criminal case. A photograph does not get nervous and confused under examination or cross-examination by a wily counsel as some witnesses are liable to do, often to the perplexity of the Court. It is, we suppose, too much to expect that the Home Office will at present organize a distinct photographic department to take full advantage of what photography is capable of rendering.

Auxiliary Lighting.—Anent the article last week on this topic, a correspondent writes to the effect that some years ago he came into possession of a stereoscopic camera, fitted with a pair of rapid rectilinear lenses. As he did not then take any interest in stereoscopic work, he took one of the lenses off and used it on a hand camera for the last four or five years. He says that a few months back he replaced the lens on the stereoscopic camera, and all the negatives since taken show a marked difference in exposure in the two halves, that taken with the lens in question always being most exposed. After reading the article, he examined the lens that had been used on the hand camera, and found that, by occasional cleaning, the inside of the tube has become somewhat polished, but the other tube retains its original dead-black condition, and suggests that the more fully exposed picture may be due to deadness of black on the inside of the tube being destroyed. We have very little doubt on the point, for quite an analogous case came under our notice many years ago, where one lens, a Petzval combination, had been extensively used for the lantern, and reblacking both the tubes restored the instruments to their original equality.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

ESPECIAL interest attaches to the Thirty-ninth Exhibition of the Royal Photographic Society, which opened last Monday, inasmuch as it is the first held since the Queen granted the Society permission to use the prefix "Royal." Let us say at once that the Exhibition is worthy both of the occasion and of the Society. It is no secret that to the President, Sir H. Trueman Wood, the Society is greatly indebted for the mark of favour which the Queen has bestowed upon it, and it must be a source of gratification to him, as well as to many others, to observe that thus early the Society is justifying its preferment by the successful organization of an Exhibition which may best be described as thoroughly representative of the present powers and capabilities of photography.

THE CONVERSAZIONE.

On Saturday evening last the time-honoured conversazione was held in the Gallery of the Exhibition, Pall Mall. A rumour reached us some time back which indicated a desire on the part of some persons to abolish this pleasing little function, substituting for it the veneered austerity of a private view. We hope we may never have to chronicle the suppression of the conversazione. It inaugurates the Exhibition season; it forms a popular reunion of many photographers who would not otherwise have an opportunity of meeting; and it is the occasion of agreeable social observances. About 450 ladies and gentlemen attended last Saturday's gathering, when the President of the Society, Sir H. Trueman Wood, M.A., received the guests, being supported by the following members of Council:—Mr. G. Scamell (Treasurer); Mr. E. Clifton (librarian); Mr. Chapman Jones, F.I.C. (Honorary Secretary); Messrs. T. Sebastian Davis, F.C.S.; W. E. Debenham; W. England; T. E. Freshwater, F.R.M.S.; Col. J. Gale; Messrs. T. C. Hepworth; T. Bedding; A. Mackie; J. W. Marchant; J. W. Swan, F.R.S.; J. Traill Taylor; E. J. Wall; Leon Warnerke; Horace Wilmer, &c. Among those present we observed, in addition to the foregoing, Mr. and Mrs. Birt Acres; Mr. and Mrs. G. W. Atkins; Mr. R. P. Drage and Miss Drage; Miss Taylor; Mrs. Clifton; Mr. and Mrs. J. Hay Taylor; Mrs. E. J. Wall; Mr. Perigal; Mr. and Mrs. Snowden Ward; Mr. and Mrs. W. D. Welford; Mr. and Mrs. T. Bolas; Mr. F. A. Bridge; Mr. T. Samuels; Mr. and Mrs. G. W. Webster (Chester); Mr. W. M. Warneuke (Glasgow); Mr. A. Haddon; Mr. J. S. Teape; Mr. P. Everitt; Mr. Conrad Beck; Mr. S. H. Wratten; Mr. H. Smart; Mr. A. L. Henderson; Mr. E. W. and Miss Foxlee; Mr. A. Horsley Hinton; Mr. J. A. Sinclair; Mr. J. Guardia; Mr. H. E. Davis; Mr. J. W. Marchant; Mr. A. W. Dollond; Mr. E. W. Parfitt, Mrs. and Miss Parfitt; Mr. and Mrs. H. R. Hume; Mr. G. W. Tottem; Mr. L. Medland; Mr. J. H. Avery; Mr. G. Gosling; Mr. A. J. Golding; Mr. P. G. Hunt; Mr. Birtles and the Misses Birtles; Mr. J. J. Gerard; Mr. A. Glendinning; Mr. Redmond Barrett; Dr. J. J. Acworth and Mrs. Acworth; Mr. E. H. Fitch; Mr. B. J. Edwards; Mr. W. H. Barnes; Mr. Monnickendam; Mr. Herbert Dennison (Leeds); Major Lysaght; Mr. Bedford Lemere, jun.; Mr. W. Atkinson; Mr. Thomas Fall; Mr. R. J. Fry; Mr. J. H. Gear; Mr. E. J. Humphery; Mr. and Mrs. W. S. Bird; Mr. A. E. Hayman; Mr. C. Winter; Mr. T. E. H. Bullen; Mr. H. W. Sanford; Mr. and Mrs. A. I. Taylor; Mr. and Mrs. W. H. Taylor; Mr. S. Herbert Fry; Mr. Hector Maclean, F.G.S.; Mr. J. Weir Brown and Mrs. Brown; Dr. Charters White; Mr. Francis Cobb, F.R.A.S.; Mr. J. J. Briginshaw; Mr. S. T. Chang; Mr. A. C. Baldwin; Mr. R. Child Bayley; Mr. W. Mayland; Mr. W. J. Hollebone; Mr. E. Cecil Hertslet; Mr. W. H.

Prestwich; Dr. Pickett Turner; Mr. H. T. Malby; Mr. A. Wrench; Mr. F. Downer; Mr. G. H. James; Miss Vincent; Mr. H. M. Sprunt; Mr. C. Forster Hayward; Mr. W. Newall; Mr. W. E. Downey; Mr. A. Maskell; Mr. B. Lintott; Mr. J. J. Holloway; Mr. H. G. Moberley; Mr. G. Lamley; Mr. J. T. Hopwood; Mr. J. D. Geddes; Mr. H. W. Bennett; Mr. J. C. Warburg; Mr. W. A. Cadby; Major Bishop; Mr. Gregor Grant; Mr. A. D. Kessack; Mr. C. P. Casstine; Mr. T. A. Scotton; Mr. W. E. Henry; Mr. Chas. Debenham; Mr. E. S. Shepherd; Mr. F. T. Carter; Mr. Edgar Scamell; Mr. S. B. Bolas; Mr. W. Thomas; Mr. W. Scorer; Mr. W. S. Rogers; Mr. and Mrs. F. Perken; Mr. C. F. Archer; Mr. C. F. Townsend; Mr. F. Brocas; Mr. Leslie Selby; Mr. A. H. Benham; Mr. L. S. Zachariasen; Mr. and Mrs. W. Taverner; Mr. Charles Sawyer; Mr. S. R. Brewerton; Mr. J. B. Panting; Mr. J. C. Burrow; Mr. H. Jeula; Mr. T. H. Young; Mr. F. Carruthers Gould; Mr. B. Foulkes Winks; Mr. E. A. Ryman Hall; Mr. Flather; Mr. H. J. Heaton; Mr. L. M. Biden; Mr. William Gill; Mr. C. H. Oakden; Mr. H. R. Yeo; Mr. A. Kemp; Mr. W. D. Howard; Mr. J. Addison; Mr. E. J. Richards; and a great many others, including a very large number of ladies. It was an animated scene and a most enjoyable evening.

Exhibition Statistics.

The appended figures will enable our readers to compare, from a numerical point of view, the present Exhibition with its two immediate predecessors:—

	No. of Exhibits, including Apparatus and Transparencies.	Total number of Exhibitors.	No. of Exhibitors members of the Society.	No. of Medals awarded.
1892	693	202	64	17
1893	395	160	49	9
1994	540	194	62	14

In most cases the catalogue gives the particular printing process employed by the exhibitor. Where that information is vouchsafed, we have sought to ascertain the degree of favour given to the various processes, with the following results, which will be found approximately correct:—

Platinotype	175
Carbon	88
Bromide	57
Gelatino-chloride	48
Photogravure	15
Collotype	14
Albumen-silver	14

How the Exhibition strikes us.

It is, undoubtedly, a fine Exhibition. In our opinion, its most distinguishing characteristic is its very high average excellence of work; there is, in fact, scarcely a poor photograph on the walls. If no one picture markedly stands out from the rest by reason of its imaginative or photographic superiority, let it by no means be supposed that the Exhibition is deficient in works revealing the very highest merit in both respects. As we said at the outset of these remarks, the display is one which well illustrates the present powers of photography, and in the technical sense it does this to a perfect degree. Briefly, each branch of modern photographic work has its latest and best developments at Pall Mall. It is an Exhibition that deserves to be studied.

The Art Judges were Mr. Cembrano, Colonel Gale, Mr. Seymour Lucas, A.R.A., Mr. Sutcliffe, and Mr. B. Gay Wilkinson. The first-named gentleman could not act, as he is abroad. The Technical Judges were Messrs. Chapman-Jones, A. Pringle, and J. W. Swan. In at least two instances, noted below, the awards are absurd, and force one to believe that "judging" is occasionally a farce and sometimes a sham. What a lot of supreme stupidity and foolishness may be indulged in under the cloak of "Art!" In addition to the inexplicable eccentricities that dictated these two awards, the Judges this year took a new and, we venture to say, wholly unauthorised departure in selecting seven exhibits for "mention," which is the equivalent, we take it, of certificating them. We plead for the retention of the sweet simplicity of the medal system hitherto in vogue at the Society's exhibitions, where it has always assumed its least offensive form. The creation of a series of awards of graduated value places the Society's Exhibition on a level with the competitions of the Slocum-cum-Podger Photographic Association or those of some of our photographic contemporaries, in which the chances of escape from a gold, silver, or bronze medal, or honourable mention, either first, second, or third, are benevolently reduced to a minimum. Besides, the appraisement of relative merit in exhibition photographs is a task which we should hope few sensible men could be found to undertake.

The Medal Pictures.

No. 21, *In Salhouse Village, Norfolk* (photogravure), by Herbert Dennison. This is a small view of a village plentifully girt with trees, with a group of ducks in the water, which composes the foreground. As an example of photogravure it does not strike us as being so good as to entitle it to the distinction it has received, while pictorially it is commonplace. Mr. Dennison, we humbly think, is lucky.

No. 23, *The Nave, Romsey Abbey, Hants* (platinum), by T. M. Brownrigg. A pleasing example of tolerably easy interior work, printed to a nice warm tone, and sacrificing much of the fine definition usually seen in this kind of subject. We do not grudge such a capital worker as Mr. Brownrigg a medal, but we congratulate him on his good fortune in this instance.

No. 41, *Where sea meets Land in daily Strife* (carbon), by Arthur J. Golding. Mr. Golding's poetical quotation is a pretty one, but it is scarcely borne out in his illustration, for his waves are delightfully placid. The picture represents a study on the seashore, the waves playing about a ruined barrier in the foreground, the middle distance merging into a line of trees on the horizon. Rough paper is employed, and the imitation of a wash drawing done by hand is very good. All the same, we should have preferred a little more range in the tones, the result tending to flatness. Despite this, it is a tender and charming study.

No. 62, *Sunshine and Shadow* (carbon), by James A. Sinclair. This is, we believe, an enlargement from one of Mr. Sinclair's Italian negatives. Two women are conducting the useful domestic office of washing clothes from the steps beside a river. The figures and accessories are naturally placed, and, notwithstanding that the negative was taken in a very strongly contrasted light, the gradation into the deepest shadows is well maintained. It is a simple theme skilfully treated.

No. 64, *Sunset in the Pool* (platinum), by J. H. Anderson, is a clever rendering of a familiar subject, craft in the river silhouetted against the cloud-flecked western sky, which, however, has the demerit in our eyes of showing too great an expanse of white paper. Still, on the whole, it is an effective and clever piece of work.

No. 147, *Harvesting the Reeds, Norfolk* (platinum), by A. Horsley Hinton. The reed harvester is seated in his boat in a little creek, surrounded by the fruits of his harvest, against a background of gaunt trees. A hard wintry light strikes across the view, and Mr. Hinton has succeeded in imparting very realistic treatment to his picture, the effect being heightened by a heavy black frame.

No. 247, *Portrait* (carbon), by Ralph W. Robinson, who has selected the head and shoulders of a lady for portrayal in profile. The beautiful sitter's head is slightly averted from the spectator, with a downward look. With the exception of the high light on the shoulders being, perhaps, a trifle too hard, the whole effect is one of great charm, the pose is remarkably natural and unaffected, the face being rendered with extreme delicacy and softness. We congratulate Mr. Robinson on the production of a fine piece of portrait work.

No. 309, *A Hampshire Home* (platinum-toned gelatino-chloride), by J. Kidson Taylor. We are always glad to chronicle Mr. Kidson Taylor's successes, as his work, while showing what delightful effects can be obtained by pure photography, is invariably instinct with artistic sentiment. He takes a medal for a view of an old homestead in winter, surrounded by trees, the details being very crisp, and the picture showing accurate exposure and careful printing.

No. 323, *A Study*, by F. Hollyer, jun., is a photogravure portrait of a gentleman, who is presumably either an artist or an actor. The

head is well posed, and the lighting good, but, as a specimen of photogravure, the picture looks somewhat coarse, although this, doubtless, was considered by the Judges to conduce to artistic breadth of effect.

No. 343, *Underground Series in the Black Country* (gelatino-chloride), by Herbert W. Hughes. A series of fourteen views illustrative of life and work in the mines. Much technical skill has been brought to bear in getting such good photographic results and surmounting the numerous obstacles that must be encountered in this difficult branch of photography. Mr. Hughes has been especially successful in the avoidance of deep shadows.

No. 365, *A Grey Day in the Meadows* (platinum), by R. Eickemeyer, jun. This, if not the same, strikes us as being much like the same gentleman's fine snow scene view, *Sweet Home*,, which we saw at the Newcastle Exhibition. It shows an old homestead in winter with a snowy foreground broken up by footprints leading up to the house. The gradation is superb; the picture has been perfectly exposed and printed, while pictorially there is something intensely beautiful and attractive in the theme and the skilful way in which Mr. Eickemeyer has interpreted it. The medal was well deserved.

No. 462, Photo-micrograph, *Purkinge Cell*, stained by the Golgi method, × 190 diameters. Dr. Leaming, of New York, secures a medal for this subject.

The "Mentioned" Pictures.

No. 33, *Silvery Ripples*, by Birt Acres. This is, presumably, in blue carbon. It represents a sea piece with rocks in the foreground, the sun forcibly striking down on the waves. It is a capital study of sea and clouds.

No. 52, *Solitude* (carbon), by J. B. B. Wellington. A large view looking across a river to a bank of trees, with a mountain in the distance, the sun being high in the sky. The lights and shadows are cleverly managed, and the result is a poetical composition of the highest class.

No. 81, *The Shades of Eve*, by her Grace the Duchess of Sermoneta. An evening view across a river, which would look just as well wrong side up, owing to the line of the river bank almost exactly dividing the picture and the perfect way in which the trees and sky are reflected in the water.

No. 188, *Sundown*, Leslie Selby. A small view on the river Thames, with boats in the foreground, mounted and framed with great taste. The effect of twilight is well suggested, and the result is a charming little study.

No. 226, *Courtyard of the Palazzo Vecchio, Florence*, by Henry Little. A large and excellent photograph of a fine old courtyard. We wish Mr. Little could have had the power to remove the two modern lamps which disfigure the picture.

No. 251, *Nocturne off Cowes*, by Charles R. Whiting. A large picture in blue carbon, apparently showing moonlight on the rock-margined sea. The presence of the steamer on the horizon greatly aids the effect.

No. 290, *Winter Scene on the Thames*, by C. Court Cole. A very pretty scene on the river, winter being well suggested by the hoar frost on the trees.

The General Exhibits.

We come now to the general exhibits. The critic's task is one of difficulty, there being so much to praise and little to condemn. The Autotype Company show *A Study of a Child* (No. 1) (red carbon), from a negative by Mr. H. Spink, of Brighton—a pleasing subject well photographed. Mr. Karl Greger's *Evening before the Day of Rest* (No. 3), is a view of craft on the river; the same gentleman's *Motive on the Dutch Coast* (No. 4) shows a group of fishermen and women, with bathing machines, on the shore. Mr. W. J. Crudge's frame of four *Wave Studies* (No. 5) are good of their kind, but otherwise not very interesting. Mr. Edgar Scamell has a good portrait, *Lord Hugh* (No. 7), and Mr. Albert Kapteyn's large picture, *Crossing the Stream* (No. 9), a team of horses just entering the water, reveals careful workmanship. Two small rustic views in Switzerland (Nos. 10 and 11), by Mr. S. B. Donkin, are noticeable for their crisp handling. There is life and motion in Mr. W. J. Clutterbuck's three views of *Norfolk Fishermen at Low Tide* (No. 14), the figures being well rendered to give the effects mentioned. Mr. J. B. Scott's large portrait of Dr. Joseph Parker (No. 15) is bold and effective, and Mr. Ralph Robinson has four portraits of very young ladies (Nos. 17–20), printed in carbon, evincing very high artistic taste and refinement in execution. We note particularly the absence of hackneyed and artificial poses, while soft and even lighting predominates.

Mr. Henry Stevens' terrier makes a reappearance on the walls. The frame called *A Study* (No. 26) ably depicts that same terrier amicably permitting a cat to repose at full length, literally under his very nose. May we venture to predict that this picture will assuredly find its way into the illustrated papers? Mr. H. W. Bennett's fishing-boat views (Nos. 34 and 35) are as good and as breezy as ever, and Mr. Tom Bright's *Southdowns* (No. 32), sheep in a field with the hills beyond, is clever. Of double interest is Messrs. Window and Grove's carbon enlargement, *Diplomacy* (No. 36), showing the Bancrofts, Mr. Hare, Mr. Forbes Robertson, and other members of the famous company. Mr. Sinclair's *Brisaggo* and *Connobio* (Nos. 39 and 40), two Italian views, are noticeably good. Mr. J. H. Avery has a view of an Essex river (No. 42), placed next to the medal picture of his friend and fellow-worker, Mr. Golding, and much resembling it in style and treatment. It is a shore piece, the wreck of a boat being in the foreground. The lady in *L'Echo* (No. 43) is made to admirably simulate rapt attention by the artist, Mr. Percy S. Lankester. Mr. Clutterbuck has another good series of seashore scenes (No. 46) and a similar Ceylon series (No. 47), the latter being interesting. Of two large views shown by Mr. Stewart Smith we prefer *The Crofter's Home* (No. 51). It is the view of a little cottage amid pleasant surroundings by a river, and all we can say is that there are apparently many worse habitations than those occupied by the crofters, or this one at any rate. Mr. Lionel Bennett has a show all to himself, as it were, his four frames being placed together in a conspicuous position below the dado-line. *Drifting Down* (No. 51) is a hazy river view; *Sunshine and Shadow* (No. 54), a strip of rugged country in sunlight; *Going Down with the Tide* (No. 55), another river scene; and *Sunset on Blair Summit* (No. 56), a lurid, but effective, sunset scene. Mr. Bennett's work is always artistic and well thought out, and, if it is his ambition to produce fine effects by photography looking as unlike photographs as it is possible to make them, why, then, he is to be complimented on his success. Mr. Dresser sends several examples of his powers, of which we like *Meditation* (No. 59), a bromide enlargement of a monk leaning against a pillar outside a church.

Mr. George E. Thompson's large carbon group, *Mr. and Mrs. Gladstone and Miss Dorothy Drew at Home* (No. 65), is sure to attract attention. It represents the aged statesman and the two ladies seated under a tree. It is a capital photograph aside of its special interest. *Easing the Yoke* (No. 69) is shown, not for competition, by Mr. B. Gay Wilkinson. It is a study of a team of oxen, printed on rough platinum. Mr. Charles Moss's *Winter Sunset* (No. 70) is a dark river view, very effectively printed in carbon. Mr. J. C. M. Grove also has a *Sunset on the River* (No. 72), which is very blurry, however looked at. The effect is possibly natural, but it is not good photography, which, no doubt, was not sought after. We like *Winter* (No. 74) by Mr. Stieglitz. It shows the sludgy snow in a street in a slight mist, pedestrians and vehicles being in the middle distance. The effect is very truthful.

Mr. Andrew Pringle sends (not for competition) views of *Martinique*, West Indies (No. 67); *Kingstown Harbour, Dublin* (No. 90); *Grenada*, West Indies (No. 180); and a *Portrait of Mr. F. M. Sutcliffe* (No. 200), the last being a capital likeness and a charming carbon print. *A Reedy Waterway* (No. 76), by Mr. Avery, is a pretty view, more forceful in expression than his *Dreamy River* (No. 91), in which melancholy and loneliness are well indicated. Perhaps the best, because the most easily understandable, of his works is *The Lock* (No. 105), another river bit, which is vigorous and well defined. Mr. Avery's exhibits do him undoubted credit. Colonel Gale has three pastoral views, scarcely, we believe, in quite his happiest manner; the large one—figures grouped about *The Village Well* (No. 98), outside an old cottage—might have been hung higher, so that its microscopic sharpness was not so apparent. *A Harvest Morn* (No. 80), by Mr. W. M. Warneuke, is an ambitious effort, the figures of two picturesque harvest women being cleverly introduced. *Relics of the Past* (No. 82) represents a well-known group

of trees in winter at Hampstead, by Mr. Wellington, who is quite at his best this year. Mr. Robert B. Walrond shows an effective view of *Auckland Harbour* (No. 86) at early morning; and technically faultless is Mr. R. J. Fry's *Old Bridge* (No. 88). Messrs. Lombardi send some portraits of ladies, of good quality. Mr. W. Atkinson's small *Mexican Scenes* (No. 94) are interesting. The inevitable *Opening of the Tower Bridge* (No. 102) is shown as an enlargement by the Autotype Company. Four views, depicting *A St. Moritz Morning* (No. 103), by Captain Bligh, are remarkably like Mrs. Main's work.

Excellent, both as photographs and photogravures, are two frames sent by Mr. Wilmer, a country lane, with bare trees, and *Woodsowe Hall* (Nos. 106 and 125). No. 111 is a portrait of a lady, by Mr. J. S. Bergheim, with little or none of the artist's mannerism, which is equivalent to saying that it shows some decision, if conventionality, of treatment. A life-size portrait of the handsome *Miss Lily Hanbury* (No. 113), taken by electric light, is shown by Messrs. Hills & Saunders. Mr. Bedford Lemère has (No. 114) four of his incomparable interiors. The portraits (heads) of the young lady in *Dorothy* (No. 115), by Mr. Edgar Scamell, are not so well vignetted as they might have been. The girls laughing over *An Amusing Letter* (No. 119), by Miss G. Stoddart, look as if they were *really* laughing and not grinning. In *Weary and Worn* and *Life's Eventide* (Nos. 122 and 123) Mr. F. L. Glazebrook shows good and sympathetic studies of old people. Mr. E. Obernetter sends several frames of small landscapes, placed behind mounts having floral and other decorative scrolls on them. They are not particularly good or interesting.

That well-known Alpine photographer, Signor Vittorio Sella, is represented by some good work, notably a splendid cloud study, representing a gathering storm (No. 133), and Nos. 158 and 162, showing crevasses in glaciers, which finely reproduce the snowy fields of these lofty peaks. Mr. Henry Sandland, in Nos. 136, 152, 256, 257, has fine and large carbon pictures of a lion, tiger, lion and lioness, and lioness. There is real cleverness, pathos, and skill in Mr. W. Gill's *Study of a Blind Man* (No. 134), and throughout the whole of Mr. Gill's other work we perceive evidence of artistic perception allied with painstaking work. Mr. Lord's *Harvest* (No. 137) is not quite successful. The two ladies watching the two men at work harvesting impart some incongruity and no point to the picture. Better, far better, in the way of imaginative effect is Mr. J. C. S. Mummery's—

> "*The Sky o'ercast,*
> *The joyless winter day.*"

It depicts a bleak lane on a bleak day; a man, shovel under his arm, and carking care showing in every line of his slightly bent body, is moodily trudging along. What's the matter with him? Has he lost his work? Is he pennyless? Has he illness at home? To our mind, Mr. Mummery has done nothing better than this. It is one of the few pictures in the Exhibition that we should like, some dark night when the Gallery attendants cease from troubling and the Assistant Secretary is at rest, to run away with.

Messrs. Window and Grove contribute a carbon enlargement of a *Group of Children* (No. 145) and four *Panel Portraits* (No. 150), which merit great praise, particularly the latter. Besides his medal picture already noticed, Mr. Horsley Hinton shows *After a Shower—Ormesby* (No. 148) and *In April—South Walsham* (No. 149), two open landscape views broadly treated. Mr. Fred Hollyer has a large platinotype reproduction of *The Story of Psyche*, after Harry Bates, A.R.A. Mr. W. Scorer's large Devonshire views (Nos. 135 and 151), and Mons. Frechon's collotypes of desert incidents, deserve attention. Mr. Gambier Bolton subjects a row of five owls to photographic treatment (Nos. 159 and 160) with very great success. In *A Veteran's Tale—The Assault* (No. 165), Mr. Clarence B. Moore very ably portrays an old war-dog fighting his battles o'er again for the edification of some listener. Nos. 175, 176, 177, 217, 218 are humorous studies of negro children. *The Study of a Girl's Head* (No. 171), by Mr. E. Lambert, was taken with a single lens; it is undoubtedly good. Messrs. Elliot & Son show a big bromide enlargement of the portrait of a lady. Mr. J. C. Burrows' underground scenes in the Festiniog slate quarries, taken with magnesium lamps and limelight, are clever and interesting. Only two or three figure studies come this year from Count Gloeden, but they are characteristic. A small *Portrait of a Lady* (No. 189), by Mr. F. Hollyer, is a soft and delicate piece of work; Mr. Henry Stevens' flower studies, *May Blossoms* and *A Gladiolus* (Nos. 191–2), are good; as is also a similar subject, *Meadow Sweet* (Nos. 193), by Dr. G. McDonald. Mr. R. Child Bayley sends *A Portrait* (No. 195), showing an elderly gentleman placidly smoking a long clay pipe. It is a carbon print. We are glad to see Mr. Shapoor N. Bhedwar figuring in a gallery which was the scene of his earliest triumphs. He has forwarded three portraits of Indian gentlemen, which are excellent. We should, however, have been pleased to notice some of Mr. Bhedwar's production in which there was more scope for the display of the deeply artistic feeling he possesses. Mr. Mackie's exhibits are all good and meritorious. We have a preference for *Playmates* (No. 301), a girl playing with a kitten; *A Light* (No. 313), one labouring man obliging another with that indispensable concomitant of the pipe of peace; and *By the River* (No. 289), a softy study of a girl, shading her eyes with her hand, looking across a river.

The Mystery of Life (No. 232) by Dr. Hall Edwards is full of thought and suggestion, the outcome of much careful reflection, we are sure. Against a dark and weird background a little child is seated, gravely looking down at a dead bird. There is much in this picture calculated to arrest attention, for it is an earnest attempt to produce a work of imagination by means of the camera. Refinement and charm characterise Mr. H. Yeo's four studies of classically draped ladies (Nos. 252–5). Miss Emma J. Fitz shows a view of a girl in a contemplative attitude seated on the shore and looking out to the sea, *Her Thoughts are ever Memories* (No. 259). It is far ahead of the notorious *Waiting and Watching*, and yet it is not more than passably good. In *Sunshine after Rain* Mr. Howson depicts the lifting of a storm over a pretty river view; the picture is well printed in gelatino-chloride. Mr. George Lamley's four mountain views (Nos. 267–270) are beautiful little studies. *The Last Load* (No. 271), by Mr. W. A. Cadby, shows a Thames barge taking its last load of straw aboard. Printed in red carbon, it has a dead black frame, and it is more striking than effective. *A Girl's Head* (No. 280), by Mr. C. Moss, is so printed that the face is only dimly seen against a dead-black background. *Painter's Corner, Holland* (No. 287), by Mr. Kapteyn, is a fine view of a beautiful spot. *Checkmate* (No. 303), by Mr. Henry Stevens, is an amusing picture. It represents an old man and a very little lad playing chess. *Miss Sherrall* (No. 312) is the portrait of a young lady very unconventionally rendered. She is standing in a very easy attitude. *Music hath Charms* (No. 322) shows a small boy playing an accordion to an attentive sister. Mr. and Mrs. Anckorn's picture was surely taken ironically. Mr. S. G. Payne has (No. 318) photographed *The Hon. Walter Rothschild's Zebra in Harness*. *Primrose Day* (No. 342), by H. Yeo, is a series illustrating a child selling flowers. Mr. J. W. Holcombe's street views in Positano, Granada, and Naples are exceedingly good. *One Too Many* (No. 364), a two's company three's none interior lovers' scene, by Mr. W. R. Cassels and the same gentleman's *Take Care He'll hear you* (No. 375), by the same gentleman, a young couple in dalliance while an elderly gentleman sits at his table writing, also by Mr. Cassels, are unimpeachable as photographs, but the composition is a trifle wooden and unreal.

Poor Mr. W. A. Cadby is unmercifully skied; he has two fanciful portraits (Nos. 368 and 408) in red carbon, which, to properly appreciate, one should look at with an opera-glass. An interior, *St. Mary's Church* (No. 369), by Mr. E. Scamell, is a sound example of this kind of photography, and the same remark applies to an interior of *Hampstead Church* (No. 418), by D'Arcis & Co. A frame of small *Zoological Studies* (No. 373), by Mr. A. Isenberg, should be seen; as animal studies they are remarkably clever. *The Lily-gatherer* (No. 376) is an attractive picture of a pretty and graceful lady leaning out of a boat reaching for lilies, by Mr. Eickemeyer. Messrs. Elliott have a fine enlargement of a Royal group, including the Queen, the Prince of Wales, the German Emperor, Empress Frederick, &c. It is in carbon, from a negative by Gunn & Stuart. Mr. G. W. Webster has three frames of the *Misses Rowley*, and *Studies of Children* (Nos. 389, 390, 391). They are small platinum prints of

great beauty and perfect technique; the pose and expression in each case are admirable, and altogether they are exceedingly refined examples of good portrait work. Mr. J. S. Bergheim's frame, *Cinderella* (No. 410), comprises three portraits from the same model, not retouched; the larger of the three is an agreeably soft picture totally unlike the other two, which are hard and unattractive. The point of the exhibit lies in the metamorphosis of plainness into beauty by lenticular means. Mr. J. M. C. Grove's *Evening on the Thames* (No. 406) and *Nightfall on the Broads* (No. 416) strike us as being more effective than his other works; they are photographically better. Mr. Percy Lankester, in Nos. 396, 398, and 477, shows some beautiful portrait work, and in Nos. 475, 476, and 477 Mr. J. H. Coath fancifully depicts child life in a most successful manner.

In the foregoing we have touched upon the more prominent exhibits in the purely pictorial part of the Exhibition: and it is no drawback to the merit and beauty of their work if we content ourselves by mentioning that of Messrs. Karl Greger (whose river studies remind us of Mr. Dresser's manner); W. Thomas; A. F. Mowll (portraits); G. Scamell; J. T. Hopwood; W. Ralston; F. Evans; S. R. Brewerton (some splendid landscape and sheep studies); A. L. Spiller; Miss Farnsworth; W. M. Warneuke (his *Annie*, a large direct portrait, is signally good); Mrs. Hignett (a very industrious exhibitor); E. Cecil Hertslet; R. Slingsby; Archibald Campbell; C. F. Townsend: R. W. Craigie; J. S. Hodson; Clement Millard, Stieglitz, &c.

Transparencies and Lantern Slides.

In front of the lantern stand is an ornamental square erection around which the lantern slides and transparencies are placed in a vertical position, thus enabling them to be viewed in a better manner than hitherto.

Of transparencies pure and simple there are not many, but they are exceedingly good. Mr. Henry Stevens shows *A Picture Antique*, an amusing study of an old lady in a donkey cart, and two flower studies, *White Cactus* and *Summer Snowdrop*. The last two look extremely well on glass. Mr. Edward Stern has a good picture of *A Camel*.

There are only eight sets of lantern slides, some of which are so good that we are sorry the Judges could not see their way to encourage this branch of photography by awarding a medal. Mr. H. Little's series have many of them a most pleasant purplish red tone; they illustrate subjects taken at Nice, Richmond, &c. Mr. George Hankins' series of twelve is devoted to flower studies, and very beautifully they are rendered; all the same, without knowing how they would look by projection, the yellowish-brown grounds against which the flowers are placed look hardly agreeable. Mr. J. H. Gear's six Westminster Abbey interiors are very good. Mr. Algernon Brooker has a very interesting series of twelve. He has photographed an elderly gentleman in various positions and with different surroundings typifying: *Good Health; Snuff; Creatures; The Connoisseur; Oysters; Literature; An Orphan; A Trifle High; The Confidential Clerk; The Unexpected Legacy; It's nearly Gone — and then! Postprandial;* all evincing great humour. The slides, besides, are technically fine. Mr. J. Doré exhibits twelve exquisitely crisp and brilliant yacht studies, and Mr. Clement Millard ably illustrates St. John's Church, Malta, and its monuments. Mrs. J. N. Hignett sends twenty-four slides of architectural and rustic subjects—without exception excellent. Mr. H. T. Malby's twelve copies of engravings made from drawings by the late J. M. W. Turner, R.A., are examples of fine definition and good exposure, and the same gentleman also shows a number of views in Wanstead Park and Epping Forest.

We are sorry to notice only three sets of stereoscopic transparencies. Mr. W. Taverner has twelve of views in the Isle of Wight, Margate, Epping Forest; Mr. J. H. Spencer, architectural views at Chester, Southport, &c., and there are some by Mr. J. R. Gotz. The revolving stereoscope in which they are shown is exhibited by Mr. Gotz; it has a screw adjustment for separating the lenses, which are achromatic objectives by Suter. As regards selection of subjects suitable for stereoscopic treatment, there is some inequality in the three sets, otherwise they are extremely good.

Mr. A. Guye has a case of enamels of great excellence.

Photo-mechanical and Scieftific Section.

These exhibits are included between Nos. 417 and 474. We presume that the photogravures by Messrs. Dennison, Wilmer, Hollyer, and others came before the Art Judges.

Mr. F. Noad Clark shows photo-micrographs of entomological subjects; Messrs. S. B. Bolas a frame of collotype reproductions of London Corporation medals, and several frames of collotype reproductions of wash drawings, also landscapes from negatives by Green Bros., all exhibiting perfection of skill in this branch of photo-mechanical work. Messrs. Marion & Co, have several excellent specimens of photogravure. Mr. H. Flather, of Scarborough, shows a dry print (or needle finished), enlarged portrait of Miss Beatrice Parke; and Mr. C. E. Corke a capital copy, in platinum, of Gainsborough's picture, *Miss Linley and her Brother*. Besides many other good examples of their work scattered about the Exhibition, the Autotype Company here show several fine photogravure portraits from oil paintings, one of Durham Cathedral, from a water-colour drawing, a really charming example; miscellaneous copies of paintings, drawings, &c., by the same process; copies of Japanese curios, in collotype; reproductions of fans painted on satin by the same method, also copies of drawings and illuminated MSS. These collotpyes are noticeably refined and delicate in execution.

Mr. S. R. Brewerton with photo-micrographs of diatoms; Mr. W. I. Chadwick with a large collection of photo-micrographs of more or less popular subjects; and Dr. Leaming with several frames of photo-micrographs of cells and bacteria, &c., figure prominently in this branch of photographic work. Of more popular interest are two examples of quick work in photography, *A Cricketer in the Act of Striking the Ball*, by Mr. Ardaseer; some instantaneous photographs (but poor prints) of athletic sports and steeplechases, by Mr. C. M. Wane; and a lightning photograph, by Mr. H. Haward, showing multiplicity of ribbonlike flashes.

Mr. Birt Acres exhibits the result of a most interesting application of the carbon process. It is a study of daffodils in colours, the latter we suppose being obtained by the superposition of different coloured tissues. Mr. Acres only claims "approximately" natural colours for the picture, but there is a remarkable closeness to the colouring of the original, as we know the flower, in this clever reproduction. The carbon picture representing the *Group of* 2400 *people at the Y.M.C.A. jubilee*, by Mr. A. D. Kessack, is also interesting of its kind. It is, we believe, the result of three negatives.

We had almost omitted to note that great taste and judgment has been exercised by those responsible for the hanging of the pictures. These, again, taken on the whole, are free of any violent eccentricities in the way of framing. The Exhibition remains open till November 14, lantern entertainments being given each Monday, Wednesday, and Saturday evening.

The Apparatus.

The apparatus in the Exhibition is rather select than numerous. B. J. Edwards & Co. have several camera stands, involving in their construction new features worthy of attention. Being made of aluminium, they are light; having telescopic legs, they are portable; and the legs not being round, but forming three sides of a square, they are rigid. They are not, however, *all* made of aluminium, for one is constructed of japanned steel. There is one large stand, exceedingly light, yet strong enough to sustain a large and even heavy camera. The formation of hollow legs of the nature indicated is a new feature in photo-mechanics. Several developing dishes of thin and flexible celluloid, rendered rigid by metal supports, are also shown. The "Edwards" dark slides are shown in aluminium and japanned metal, likewise an adapter for the same, with film-carriers for exposing films in dark slides.

We had occasion a short time ago to speak of the advantages to the photographer arising from viewing Nature through coloured glass, which would allow the observer to see a scene as it would appear in a photograph. Messrs. R. & J. Beck exhibit a number of their phototone spectacles and eyeglasses specially constructed for this purpose. The colour of the glass, which is optically worked, is a special shade of dark green, which, when looked through, imparts a true photographic value to all coloured objects examined.

A changing back by Thos. Samuels for containing two dozen 10×8 films or half that number of glass plates is the largest of the kind we have seen, for it is very rarely that sheaths are employed over half-plate size, those for quarter-plates being most in use. The sheaths in this are of a nature different from Mr. Samuels' original ones, and the method of drawing up those that have been exposed and transferring them to the back is a great improvement upon anything we have previously seen. You pull a tag in the centre of the flexible bag, and up the plate comes ready for transference behind the others in the reservoir. The twenty-four films are contained in a changing back, which occupies a bulk scarcely greater than two dark slides.

Watkins' Eikronometer, constructed by R. Field & Co., is exhibited by this firm. It is described in the catalogue as "an instrument for timing photographic development, pyro-ammonia excepted." A description of the instrument will be found in our columns of a few months back, and to this the reader is referred.

Several "binocular" cameras (so called) are exhibited by the London Stereoscopic and Photographic Company, Limited. The term *binocular* is usually applied to a camera having two similar lenses arranged for stereoscopic work; but in these instruments the exhibitors have introduced a change in the nomenclature and imported a different meaning to the term. In effect, they each form a single camera, one half being devoted to monocular work, the other half being relegated to finder purposes. The snap-shot enlarger is a neat folding piece of apparatus, capable of enlarging to two diameters. Other enlarging cameras of this class, but of different sizes, are also shown.

The Naturalist's camera of J. H. Dallmeyer is a well-made oblong camera, with a finder eyepiece of a compound nature. This much we can readily discover through the panes of the glass case in which it with other exhibits are enclosed; but we have had other means of noting its undoubted efficacy. It need not be here described; in our issue of a fortnight ago (page 589) we published the patent under which it is made. We may here say that, in effect, it partakes of the nature of a telescope, mounted above the camera, by which critically accurate focussing is ensured. The showcase also contains varieties of tele-photo and other lenses, together with a hand camera and Burchett's colour screens. The Naturalist's camera has secured a medal for Mr. Dallmeyer, at which no one will feel disposed to grumble.

THE PRESS ON THE EXHIBITION.

The Daily Telegraph says:—"Artistically, the Thirty-ninth Annual Show of the Photographic Society of Great Britain, which has become Royal since its last exhibition, is probably the best that has been held. Of the 500 pictures several are of high class and none of really poor quality."

The Daily Chronicle says:—"It need scarcely be said that the work displayed is of the highest excellence in photographic art, but at the same time one misses the striking features which have made previous exhibitions notable. There is not one work which stands out as above and apart from the rest. To the layman it would seem as if the limits of the art had for the present been reached, and that future developments must be looked for in that philosopher's stone of the photographer—photography in colours."

The Observer says:—"The 'Press view' made strikingly manifest the wonderful advancement of the photographer's art since the foundation of the Society. Of the 500 exhibits very few fall short of the highest standard of quality, both artistic and technical, and this all but uniformity of excellence renders it impossible to point to any one picture as of paramount merit."

The Pall Mall Gazette has some silly and "ill-natured remarks suggested to one who is neither an artist nor an art critic, not to speak of a photographic artist, nor a P.A. critic, by the Thirty-ninth Annual Exhibition of the Royal Photographic Society of Great Britain. It is rather a poor show even for an exhibition of photographs; but, such as it is, one can commend it to all who are fond of photography."

VIGNETTING.

II.

An alternative method consists in substituting for the central mask an opaque screen with an opening in it, such as is employed in the ordinary course of vignetting. This, of course, gives a reverse or negative vignette, from which others may be reproduced in the usual printing frame, without the trouble of resorting to the use of the rotating table. This plan has the advantage that, a perfect negative obtained, it is always easy to reproduce vignetting glasses of precisely similar character; and, further, that the centre or clean portion can be obtained absolutely without the deposit, which is not always the case when the screen is used at a distance from the sensitive surface. This is, of course, a matter of some importance when quick printing is essential, but, except with carbon tissue, I scarcely think the gradation is so soft as when the rotating table is used.

The shape of the mask or opening is another matter that requires a little attention in order to secure a nice and symmetrical shading round the figure. I have tried all shapes, but for general purposes nothing is better than the simple oval, as it is suitable for almost any kind of figure or subject. The "pear" or egg shape will often give a more pleasing result if it is accurately adapted to the shape of the figure; but, as figures differ very materially in outline, the same vignettes can scarcely be expected to serve all purposes. Whatever the chosen shape may be, it must be borne in mind that, in the process of gradation, it is very materially altered. For instance, take as the standard dimensions of an oval of pleasing shape the proportions of 4:3 in length and breadth respectively; if a mask of those proportionate dimensions be placed at a distance of half an inch from the sensitive surface on the swinging table, the light will work underneath in all directions equally, so that, in the end, the clear opening of the vignettes will be longer and narrower in proportion than the original. If, on the other hand, a central opening of the same dimensions be used, a precisely opposite result will be obtained, and the oval will approach nearer to the circular shape.

A variation from this rule may be mentioned, however, for, if an opaque central mask be employed of nearly the full size of the plate or printing frame for making the edge vignettes I shall describe presently, the clear opening will be found to be broader in proportion than the original instead of the narrower, and the oval shape is lost. This is owing to the fact that the sides of the printing frame prevent the light acting freely underneath the mask except at the corners, with the result that the clear opening approaches a diamond shape with rounded corners. To avoid this, a larger printing frame should be used.

In order even to obtain symmetrical and pleasing masks or vignettes, it is necessary to bear these little points in view, and a few experiments with the printing frame and silvered paper will soon put matters in a straight course. In fact, after a few such trials it will be comparatively easy to make a vignette for any particular figure, however *outré* or unusual its shape may be. Thus a lady in a Gainsborough hat or a reclining figure may be as easily and as perfectly vignetted if desired as the most mathematically square figure that can be posed.

Now, with regard to the vignetting glasses themselves, I have already said, in my previous article, that, as the density increases, the softness or delicacy of gradation diminishes, and a better and softer result is obtainable from two thin vignettes than from a single denser one. On this account I very much prefer to employ two separate glasses with different-sized openings, one as large, or nearly so, as the size of the plate, and destined chiefly to keep the edges clear, and others of different sizes to suit different figures, and to merge into the larger or edge vignette. These may be kept separate or, as I prefer, they may be bound together in pairs, after the style of a lantern slide, in which case, besides forming a more perfect vignetting screen, the films are protected from damp and injury.

This description may appear lengthy and the trouble out of proportion to the result, but I think those who have much vignetting to do will soon appreciate the value of the method if they once adopt it. It is an easy matter, when a set of masks has been once made, to keep up a constant supply of vignetters without practically any trouble at all, as the work does not in any way interfere with the ordinary course of printing. When the perfect vignetters are obtained, there is no further trouble in printing in the shade or under tissue paper, or similar dodges, but the vignetter may go out in the sun, if desired, with the other frames.

W. B. Bolton.

DEVELOPMENT WITH THE ALKALINE CARBONATES.

Part III.

Experiment No. 14.—The developer employed was solution C and potassium bromide. The process of development lasted for thirty-one minutes. At the end of the first thirteen minutes the image began to appear, and was completely visible at the end of twenty-two minutes. The result was a fine positive, almost identical in appearance with that obtained in the preceding experiment.

Both these positives were of a rich brown tone, and showed no trace of yellow colour in the high lights.

The conclusions which may be legitimately drawn from the results of these experiments must now engage our attention. With the object of affording the practical photographer full data for the study of the nature and qualities of the different developers employed, I have given in a tabular form a comparative view of the results of a careful examination of the original positives.

Taking into consideration all the qualities which go to make up a perfect image—density, contrast, or range of tone, clearness, freedom from fog, &c.—I have, in the column headed "Order of Merit," represented this combination comparatively by a scale of thirteen degrees.

Density is similarly expressed in the next column, the No. 1 representing the greatest density, and the No. 14 the last. Contrast, or range of tone, will be found to be indicated in the same way.

The column headed "Clearness," includes those positives only in which the lights are represented by more or less clear glass.

The next column deals with those in which the high lights are of a distinctly yellow tint. Six, the number of least intensity, must here be taken as the representative of the greatest clearness.

The last column gives a scale for the estimation of the tinting produced by green fog and marginal stains, the deepest colour being represented by the No. 1, and the faintest by the No. 5.

On examining this table we note, in the first place, the rather curious fact that the least satisfactory picture of the series was that obtained with the pyro and ammonia developer.

Ammonium bichromate, we find, gives an almost equally poor result, and there is also a decided loss in clearness, and a great increase in the time required for development; so, on the whole, the latter developer seems to be altogether the worse of the two.

We cannot therefore attribute any merits which we may find the sesquicarbonate developer possesses to the percentage of bicarbonate that is present in the solution.

Another fact that deserves our notice is the difference in regard to tone that exists between the several positives of the series. In only six of our results do we meet with that uniform yellow tint which we are accustomed to look upon as the characteristic and inseparable feature consequent on all development with the alkaline carbonates. But, if we employ one or other of the solutions of ammonium carbonate, not the slightest trace of this colour is imparted to the image; the tone that is produced being then very similar to that obtained with pyro and ammonia.

The presence of a restrainer does not seem to have any influence in diminishing the intensity of the yellow colour, as is shown by the table, where we find that the deepest tint was produced when the plate was developed with potassium carbonate and bromide. On other grounds, however, the addition, in all cases, of a percentage of bromide must be strongly recommended. The table, again, will be found to furnish convincing arguments in favour of such an addition. Glancing over it, and grouping together the solutions of like chemical constitution, we find that, without exception, the best results were produced in those cases where a restrainer was present. This point is particularly worthy of the notice of those who are under the impression—an impression which I cannot but think is an erroneous one—that such an addition is unnecessary in the case of the carbonate developers. Moreover, as green fog would seem to be the inevitable result of the omission of a restrainer from the ammoniacal developers, this circumstance in itself affords a good reason for the employment of a bromide in conjunction with these solutions.

The special merits and defects of the different developers are pretty clearly shown in the table.

Table of Results Obtained in Experiments with the Carbonate Developers.

No. of Plate.	Developer used.	Time in which the Image appeared.	Time in which all the Details were visible.	Whole time of Development.	Order of Merit.	Density.	Range of Tone.	Clearness.	Intensity of Yellow Tone.	Intensity of Brown Veil due to Green Fog.
	Standard Solutions.	Seconds.	Seconds.	Seconds.	(1 to 13)	(1 to 14)	(1 to 13)	(1 to 8)	(1 to 6)	(1 to 5)
6	Ammonium sesquicarbonate and ammonia	..	20	60	9	9	8	6	..	3
7	Ammonium sesquicarbonate, ammonia, and potassium bromide	..	25	75	4	3	2	4	..	5
4	Potassium carbonate	..	45	75	11	11	11	..	3	..
2	Lithium carbonate	..	45	90	10	10	10	..	4	..
8	Sodium carbonate	..	50	105	9	8	9	..	2	..
1	Ammonia and potassium bromide	..	60	120	13	14	13	3	..	..
5	Potassium carbonate and potassium bromide	..	60	135	7	2	5	..	1	..
9	Sodium carbonate and potassium bromide	..	80	150	3	5	3	..	6	..
3	Lithium carbonate and potassium bromide	..	90	135	5	12	6	..	5	..
10	Ammonium sesquicarbonate (Solution C)	..	240	480	6	1	4	7	..	2
12	Ammonium sesquicarbonate (Solution B)	120	330	720	8	4	7	8	..	1
11	Ammonium bicarbonate	300	510	900	12	13	12	5	..	4
13	Solution B and potassium bromide	840	1320	1680	2	6	1	2	..	..
14	Solution C and potassium bromide	780	1320	1860	1	7	1	1	..	..

The best developers of the series are undoubtedly the two solutions of ammonium sesquicarbonate, designated respectively B and C. This is clearly proved by the fact that these solutions, when unrestrained, gave results decidedly superior to those produced by the unrestrained solutions of the carbonates of sodium, potassium, and lithium, and the restrained solutions results proportionately superior to those that were obtained when the three said solutions, modified by the addition of potassium bromide, were again employed.

Under both conditions, C, the weaker solution (containing 21·5 grains of sesquicarbonate per fluid ounce), proved the more satisfactory developer. Except in cases where excessive density is required, the restrainer should not be omitted. The only objectionable feature—if, indeed, it be one—of this developer is its exceedingly slow rate of action. Apart from this, I have no hesitation in saying that, as yet, I have met with no developer capable of producing finer results. At some future date I hope to be able to give an account of its behaviour under conditions of a different kind, including the cases where exposures of varying duration are resorted to.

The restrained sodium-carbonate developer would seem to be the next in order of merit. The circumstance that the minimum tint of yellow is obtained by employing this solution may be pointed out for the benefit of those who, on account of this colour, entertain an objection to developers of the carbonate class.

The restrained solution of ammonium sesquicarbonate, and free

ammonia is also a serviceable developer. It is, however, rather too rapid for general use, and, moreover, is apt to produce excessive density and green fog. An increase in the proportion of bromide would probably cure all three defects.

Next in order comes the lithium-carbonate developer. Employed along with a restrainer, it produces a picture in which a slight degree of absolute density is combined with a considerable variety in the half-tones. We may, therefore, employ it with propriety in cases where we desire to heighten the contrasts of a dark subject. I have found it of service in the treatment of landscape pictures in which the foreground consisted mainly of dense masses of foliage.

Lastly, there is the potassium-carbonate developer. The restrained solution produces an image of considerable density, and of a range of tone slightly in excess of that obtained with the lithium-carbonate developer. In all cases where density is the chief object to be attained, this developer is to be preferred to any of those already mentioned. When I have had occasion to employ it in the development of general landscape work, the results have been invariably satisfactory.

Other conclusions drawn from the facts furnished by the table might be given; but as I am inclined to think that my readers will have no difficulty in forming these for themselves, I am unwilling to add to what I have already said on the subject.

There is one point, however, to which I must make reference. It will be noticed that, in speaking of formulæ, I have said nothing of sodium sulphite, a salt which, in its double capacity of pyro-preservative and clearing agent, it is customary to add in quantity when the developer happens to contain a carbonate.

This omission is due to the fact that my personal experience has convinced me that such an addition has the effect of weakening that vigour-producing quality which is the distinctive feature of the class of developers with which I have been dealing.

For preservative purposes glycerine and methylated spirit will be found quite as efficacious as sodium sulphite, and, as I have already shown, the qualities of the sesqui carbonate developer are such that the presence of a clearing agent is unnecessary.

MATTHEW WILSON.

THE RECOVERY OF ACCIDENTALLY EXPOSED PLATES.

[Pacific Coast Photographer.]

A PLATE which has received an exposure not exceeding certain limits can be restored to its original condition by the action of certain oxidising agents. This fact is of great importance in the case of accidental exposures. Two exposures are sometimes made on the same plate, or a paper box containing plates may become broken; in either of these cases the effect of the light can be annulled by the above treatment. If a box of plates should be accidentally opened in daylight, the top plate would probably be beyond recovery, but the remainder, which were partly protected, could easily be restored and made fit for service.

The effect of friction or concussion is identical with that of light. Lines traced on the surface of a plate with a hard-pointed instrument will develop perfectly black, or a sharp stroke with any hard substance will result in a black mark after development. Plates which are packed face to face will, if not packed carefully, rub against each other and cause scatches, which will develop black, though there may not have been any visible marks before development. A plate may be entirely freed from defects of this nature by treatment with an oxidising solution.

Among the oxidising agents available for this purpose are bichromate of potash, permanganate of potash, and the salts of copper. An exposed plate, after being treated with a solution of bichromate of potash, will, except in extreme cases, show no signs of darkening under the developer; if the developer is very strong, or the exposure prolonged beyond a certain limit, a faint fog will appear; but, generally, there will be no appreciable action. The solution to be used should be about one per cent. strong, and made slightly acid with sulphuric acid. The plate should be soaked for about five minutes, and then carefully washed and dried. A thorough washing is necessary, for any bichromate remaining in the film would impair the sensitiveness of the plate, and would also greatly retard the action of the developer. If the washing has been thorough, and the drying conducted properly, the plate will be very nearly as sensitive as it was originally. Permanganate of potash is more powerful than bichromate.

A solution of one part permanganate in 300 parts of water, when applied to an exposed plate, will completely destroy the effects of light. In this case, however, the plate is never perfectly clear, since the permanganate oxidises the gelatine of the film and produces a red precipitate of oxide of manganese; for this reason the permanganate solution is not suitable for practical purposes. A two per cent. solution of bromide of copper works well as an oxidising solution, but the sensitiveness of the plate is very much reduced by its action. Bromide of copper can be applied in a much stronger solution, and its action carried much further than that of either bichromate of permanganate of potash, since there is no oxidising effect on the gelatine, and consequently no danger of insoluble precipitates forming in the film.

The copper solution may be used as a remedy for extreme over-exposure which could not be corrected by modifications in the developer. When such a case of over-exposure is suspected, the plate may be placed before development in a very weak solution of bromide of copper for a short time, and then thoroughly washed and developed in the ordinary way. Of course, this manner of working depends to a certain extent on chance, for there is no way to judge of how far the action of the copper solution should be continued.

In all of these operations the greatest care must be taken to keep the solutions separate; every trace of oxidising solution must be removed from the plate before drying, and the oxidising and developing solutions must not be used in the same trough.

In using the restored plates a very full exposure should be given, not only on account of the reduced sensitiveness, but because the development must not be forced. When a strong developer is necessary, great care must be taken not to bring out any traces of the old exposure.

CORWIN MITCHELL.

Our Editorial Table.

A LANTERN-SLIDE CLAMP.

THE Photographic Enterprise Company, Birmingham, send one of



these clamps. They are intended for holding lantern slides when binding them. The cut shows the configuration.

DUBLIN CONVENTION VIEWS.

WE are favoured by Mr. Matthew Surface, a brother journalist, with some stereoscopic slides taken during the recent Convention. The scenes portrayed by Mr. Surface are in the town of Killarney and around its famous lakes. Among the latter we note some charming bits of scenery, such as the *Old Weir Bridge*, the *Torc Waterfall*, the *Brickeen Bridge*, and *Muckross Abbey*. A most fertile field for stereoscopic photography is to be found in this vicinity.

News and Notes.

THE HAMPSTEAD OUTING OF THE PHOTOGRAPHIC CLUB AND LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—This takes place on Saturday next, September 29. Members are asked to meet at half-past five for six at the Bull and Bush for tea.

MESSRS. F. YORK & SONS, of 67, Lancaster-road, Notting Hill, have secured the production of lantern slides from the negatives of the series of mining pictures for which Mr. H. W. Hughes has received a medal at the Royal Photographic Society's Exhibition.

THE PHOTOGRAPHIC EXHIBITION.—Lantern arrangements for the week.—Monday, October 1, slides by Mr. A. L. Henderson. Wednesday, October 3, to be subsequently announced. Saturday, October 6, slides by Mr. J. W. Holcombe—*Here and There in Italy and Spain.*

WE are extremely sorry to learn of the death of Mr. T. Underwood, of the firm of E. & T. Underwood, photographic-apparatus makers, Birmingham, heart disease being the cause. Mr. Underwood was a gentleman of great ability in his business, and was highly esteemed by a large circle of acquaintances.

MR. W. F. FENTON-JONES, Hon. Secretary of the Hackney Photographic Society, writes: "Will you please note our new premises now, *i.e.*, after the end of this month, as the 'Pembury Hotel, one minute's walk from Hackney

Downs Station, Great Eastern Railway.' This is owing to the fact that our present quarters are far too small for our rapidly increasing membership."

PHOTOGRAPHIC CLUB.—The winter session of the Photographic Club will open on Wednesday, October 3, when Mr. Andrew Pringle, F.R.M.S., will give a paper on *Photo-micrography*. The meeting will be open to visitors, who can obtain cards of admission from the Hon. Secretary, Mr. J. A. Sinclair, 26, Charing Cross-road, W.C. The Club meets at Anderton's Hotel, Fleet-street, E C., at eight o'clock on Wednesdays.

WEDNESDAY EVENINGS AT THE SALON.—On Wednesday evenings, while the Salon Exhibition is open, informal meetings will be held in the Dudley Gallery from eight to nine, when discussions on art photographic topics will take place. It is in contemplation to have the discussions opened with short papers by such gentlemen as Mr. H. P. Robinson, Rev. F. C. Lambert, and others. Admission will be free. We shall give further particulars next week.

MESSRS. LONSDALE BROTHERS, of Grove Works, Claypit-lane, Leeds, write: 'Having for some time past been greatly inconvenienced by the insufficient accommodation of our workshops, we now beg to inform you that we have secured premises at this address, having an area of upwards of 4500 square feet, and which we have fitted up with power and labour-saving appliances of the most approved construction. We shall now be able to combine our brass-finishing, camera-making, and polishing, as well as office and warehouse accommodation, in the same building."

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Seventh meeting of Delegates, Wednesday, September 12, at 50, Great Russell-street, Mr. E. Clifton (Photographic Club), Chairman, presiding. After some discussion upon the proposed list of dark rooms, &c., it was suggested that the Secretary should ask the affiliated Societies to obtain from their members further information as to places to photograph, and particulars of charges for doing so, if any, &c. It was suggested that a paper with a description of the slides should be inserted with each box of lantern slides for circulation, and this was carried. Mr. Welford (Midland Camera Club) stated that some Judges had not followed the rules laid down by the Conference, and raised the question as to what action could be taken in the matter. He wished to enter a strong protest against the action of those Judges. It was agreed that another Conference of the Judges should be held to prevent a recurrence of the irregularities. The circulation of a simple paper upon *Colour Photography*, and of a set of slides illustrative of Rejlander's work, was mentioned.

"A TRAVELLER" writes: "I had handed to me by a friend the enclosed card. I thought the free portrait business was dead, but apparently it was only scotched:—'Life-sized portraits given away as a premium for cash trade according to the following conditions:—With every 2*l*. worth of cash purchasers at our store you will be entitled, free, to one elegant life-sized Aerinda portrait, copied from any photograph you may select, and finished in the most artistic manner, and of the same quality which commands at retail 3*l*. These Aerinda portraits, we positively guarantee, are made by the Merchants' Portrait Company, Limited, 106 to 110, Kentish Town-road, London, N.W., who are the originators of the Aerinda portraits, and who, in order to guard against inferior imitations of their celebrated productions, have copyrighted the name "Aerinda." The reputation of this Company for portraiture of the highest excellence is unsurpassed, and in order to further advertise their work, and upon our agreeing to use their Aerinda portraits exclusively in our business, they guarantee our customers not only as to the artistic merit of the work, but also the likeness and durability. Their work will please you, and it will last. In order to see that their portraits are suitably and properly framed, this Company furnish their own frames, and have made it conditional upon us that with each portrait we sell a frame, an assortment of which we shall keep at 14*s*. each and upwards, subject to your own selection as to style and quality. We give you the portrait free; you pay for the frame only.'"

THE AQUARIUM EXHIBITION AWARDS.—Class A, silver medal, No, 4, Mrs. E. M. Baldwyn; bronze medal, withheld; diploma, No. 56, E. Hawkins, No. 86, W. P. Marsh. Class B, silver medal, withheld; bronze medal, T. L. Syms; diploma, No. 37, J. H. Gear, No. 96, Douglas Pym. Class C, silver medal, No. 34, E. Dockree; bronze medal, withheld; diploma, No. 15, S. L. Coulthurst, No. 80, W. P. Marsh. Class D, silver medal, Nos. 82 and 83, W. P. Marsh; bronze medal, withheld; diploma, E. Dockree. Class E, silver medal, withheld: bronze medal, withheld; diploma, W. P. Marsh. Class F, silver medal, E. Dockree; bronze medal, withheld; diploma, W. Green, W. P. Marsh. *Pearson's Weekly* Competition:—Class I., 1st award, No. 137, R. Frost; 2nd, No. 107, W. S. Aston; 3rd, No. 118, Major Bruno, No. 153, H. O. Isaac, No. 169, I. C. Oliver, No. 189, J. Kidson Taylor. The Aquarium Society, in addition to the above, give silver and bronze medals and diplomas to the competitors in the above order:—Class II., 1st award, No. 235, Hall-Edwards; 2nd, No. 264, G. Baynes-Rock; 3rd, No. 219, O. Charney Bradley; 4th, No. 263, R. E. Ruddock. The Aquarium awards a bronze medal to Dr. Hall-Edwards as well. Class III., 1st award, bronze medal, No. 297, H. O. Isaac; 2nd, No. 305, L. Medland; 3rd, No. 327, W. D. Welford; 4th, No. 287, S. L. Coulthurst; 5th, W. B. Dart. Class IV., 1st award, silver medal, No. 336, R. Frost; 2nd, bronze medal, W. Nome, J. C. Burrow (equal); 3rd, No. 343, E. Griffiths. Class V., 1st award, silver medal, Hall-Edwards; 2nd, bronze medal, S. L. Coulthurst; 3rd, diploma, R. Frost; 4th, diploma, E. G. Lee.

OTHELLO writes:—"Anent your article in your JOURNAL a week or so ago about the wonderful cutting of prices, &c., of photographs in Australia, I enclose a slip from a Cleveland, Ohio, U.S.A., paper, to show that things are pretty well the same there. Oh, those glorious diamond rings! when are English photographers going to dabble in jewellery also?—'Blazing diamonds. Rings intended for babies appropriated by mothers and young ladies with small fingers. Every ring given away brings in scores of sitters, making it imperative to continue the offer one week longer. What has proven one of the surprises of the week was the extraordinary demand for the pretty diamond rings given away this week at the Pifer & Becker Photographic Palace. Early in the week it was seen that the quantity of rings on hand would not hold out, and a second order was immediately telegraphed for. Mothers have brought in their babies for a sitting, and invariably they sat themselves in order to secure another ring. The fact that every customer who has taken one home has excited her whole neighbourhood speaks volumes for the offer that is now to be continued one week longer at this gallery. Many ladies with small, delicate fingers have appropriated them. They are absolutely irresistible, and, when one considers their actual value and the photographs combined, it is no wonder that the public has been taken by surprise. Cabinet photographs will be made for one dollar per dozen, and proofs shown, and, with every dozen famous silver-medal three-dollar cabinets, a baby's magnificent diamond ring will be given free of charge. There is but one gallery in the city that gives the public the full worth of their dollar, and this is the Pifer & Becker Photographic Palace, Wilshire-building.'"

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,675.—"An Improved Sheath or Carrier for Photographic Films and Plates." T. SAMUELS.—*Dated September*, 1894.

No. 17,688.—"Improved Apparatus for automatically registering the Exposure of Photographic Plates and Films." J. R. C. GALE and J. W. T. CADETT.—*Dated September*, 1894.

No. 17,758.—"A Process for Photographing in Colours." V. MATHIEU.—*Dated September*, 1894.

No. 17,844.—"Improvements in or connected with Photographic Shutters." Complete Specification. C. P. GOERZ and E. A. R. NERRLICH.—*Dated September*, 1894.

No. 17,785.—"A New or Improved Reflector or Diffuser, principally applicable for Photographic Purposes." F. J. BORLAND.—*Dated September*, 1894.

No. 17,894.—"Improvements in Bellows for Cameras, Blowers, and the like." A. H. MITCHEL-JONES.—*Dated September*, 1894.

No. 17,895.—"Improvements in Cameras." A. H. MITCHEL-JONES.—*Dated September*, 1894.

No. 17,924.—"Improvements in or in connexion with Photographic Shutters known as Blind Shutters." H. R. COOK.—*Dated September*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN AND CONNECTED WITH SHUTTERS, CAPS, OR COVERINGS FOR LENSES OF PHOTOGRAPHIC INSTRUMENTS.

No. 11,391. HENRY THIÉBEAULD DE LA CROUÉE, Homeleigh, Whitehall-road, Woodford, Essex.—*August* 25, 1894.

THE object of my invention for improvements in and connected with shutters, caps, or coverings for lenses of photographic instruments is to improve the construction and operation of the same so as to expose a part of the area of the lens, and also the part corresponding therewith, on a sensitised plate, for a longer or shorter period, as may be desired, so as to govern the central and side powers of the lens equally, or, if necessary, unequally, on the picture plane, and allow varied periods of exposure on different parts of the sensitised plate. With this object, I provide a circular disc fitted concentrically and entirely covering the lens with a small aperture therein of a suitable form to equalise, graduate, or vary the central, and side, and other powers of the lens, and to stop out the centre, or, as desired, any other part of the lens with reference to reception, detail, and distribution of light, and give a longer or shorter period of exposure to any part of the sensitised plate through an aperture, the area of which increases from the centre of the disc towards the periphery and *vice versâ*, the lens never being entirely exposed at any given time.

When desiring to give greater exposure to the edges of the sensitised plate, the aperture is triangular in form with a circular base, the apex being at the centre and the base at the periphery, whilst the reverse is the case if the centre is to receive the greater exposure.

The disc is mounted in a suitable shutter frame, and made capable of revolution. It also acts in conjunction with a cover or drop shutter, turning on a fixed pivot on the shutter frame, in order to close the exposed aperture in the disc before the commencement and at the finish of one or more of its revolutions.

IMPROVEMENTS IN THE PRODUCTION OF PHOTOGRAPHIC NEGATIVES.

No. 16,354.—Dr. EUGEN ALBERT, 55, Schwabinger Landstrasse, Munich, Germany.—*August* 25, 1894.

THIS invention has for its object to provide improved forms of stops for use in the production of screens and of autotype negatives, such stops being characterised by the fact that they exclude the rays of light which would act detrimentally on the screen or negative.

The principles underlying the construction of my improved stops may be explained as follows:—

If the lens of a camera is focussed on a smooth white surface, and if in front of the sensitive plate in the dark slide (and at a small distance from said plate) an opaque plate is placed (for example, a second glass plate covered with tinfoil), in which opaque plate a small transparent spot about a quarter of a millimetre in diameter is provided, it is clear that, after exposing the sensitive plate and developing it, a small round point will appear on the negative. The roundness of the form and the size of the point are not so much caused by the fact that the hole in the tinfoil is round as by the circular form of the lens or its stop.

A small stop gives a smaller black point than does a large stop if the ex-

posures are equal. If the exposure with the smaller stop be prolonged, the size of the point on the negative would be increased by the solarisation of light, *i.e.*, the power of silver salts to propagate the action of light laterally on the sensitive plate. If in place of a stop with a circular opening, having, for example, a diameter of four centimetres, a stop is used with a diametrical slit in it four centimetres long and one centimetre broad, hereafter termed the "slit stop," the result on the negative is no longer a round point, but a correspondingly small and narrow line in a direction parallel to that of the slit in the top.

If in place of the above-mentioned opaque plate a screen, such as is usually employed for the purpose of process work, is used, and a reproduction of it is made with the above-mentioned slit stop, a result is obtained totally different from that obtained with a round stop, and this result is dependent upon the direction of the slit. For simplicity's sake, the case of a single line, not crossed, screen will be considered.

If the slit is parallel to the direction of the lines of the screen, the reproduction will consist of sharp lines, the breadth of each of which is dependent upon the duration of the exposure and the breadth of the slit, the density being regulated by the length of the slit.

But, if the slit is turned through ninety degrees, so that it is at right angles to the direction of the lines of the screen, the result will be a series of lines so absolutely blurred and insufficiently dense that it is often difficult to recognise them.

If two parallel slits are made in the stop, and placed parallel to the direction of the lines of the screen, then, subject to the distance of these slits from one another, two lines instead of one for each line of the screen will appear on the sensitive plate, and the number of lines of the original screen will be doubled, or the lines will touch and the middle appear dark.

The explanation of the above is simply this, that all portions of the lens opening which lie on either side of an imaginary line, bisecting it and parallel to the lines of the screen, transmit light through the screen on to the sensitive plate at an angle which increases proportionately to their distance from the imaginary line, whereas all parts of the stop in the imaginary line or lying near it are without any side dispersion so far as their passage through the screen is concerned.

Although the slit stop makes possible the preparation of any form of screen, still its importance for such work is not so great as for the preparation of process-block negatives. In the autotype or process negatives the tones of the original are split up into points and lines by placing the screen in front of the sensitive plate; and it is to be noticed, in the first place, that the negative itself must contain no half-tones, but only opacities and pure transparencies, and the reproduction of the various tones of the original is solely effected by the greater or smaller area of the opacities and transparencies, which therefore must range from 0 to infinity, *i.e*, the narrow opacities of the negative must correspond to the deep tones, and the small transparencies must correspond to the light tones, of the original.

This variety in the area of the opacities and transparencies is regulated by the power of solarisation possessed by the silver salts, by the size of the stop, by the distance of the screen from the sensitive plate, by the focus of the lens, and, lastly, by the degree to which the original is to be reduced in the reproduction.

The larger the stop, the further the screen from the sensitive plate, and the nearer the screen and the sensitive plate are to the lens the more obtuse is the angle at which a given part of the rays of light strikes the sensitive plate. The result is that, in those parts of the negative which correspond to the lights of the original, the screen expands, and, in consequence of the strong light, is well covered, and, being partly assisted by solarisation, narrow-pointed transparencies are therefore formed in the lights. This expansion takes place in all parts of the negative, with the difference, however, that, in those parts which correspond to the deep tones of the original, broad, woolly, weak points appear, because the weakness of the light reflected from the shadows of the original precludes good density. With a smaller lens opening, and under conditions diametrically opposed to those before mentioned (*i.e.*, if the light rays fall upon the sensitive plate at the acutest possible angle), in those parts of the negative which correspond to the deep tones of the original, small, well-covered, clean-cut points are obtained, but the parts corresponding to the high lights of the original are inadequately closed, because the solarisation is insufficient to progagate the influence of the light laterally to the required extent.

From the knowledge that only those portions of the stop opening transmit oblique light to the sensitive plate which lie on either side of an imaginary middle line parallel to the lines of the screen (or, in the case of crossed screens, those which are further from the middle point), as above explained, one is able to construct stops which are totally different from those generally used, and which are characterised by their power of eliminating all light which would act in a way detrimental to the production of screens or of autotype negatives.

The forms which such stops can take are very numerous, and their general characteristics are that the opening is not circular or that they have more than one opening.

The claim is :—For the production of screens and autotype negatives, stops which contain more than one opening or which contain one opening which is not circular, for the purpose specified.

Improvements in Photographic Cameras.

No. 19,304. John Dunseith McKellen, 23, January-street, Chorlton-on-Medlock, Manchester, and Samuel Dunseith McKellen, 2, Clarence-street, Albert-square, Manchester.—*August* 25, 1894.

Our invention relates to an improved method of changing and storing sensitive photographic plates and films, and is especially applicable to so-called magazine hand cameras. We carry the plates or films in sheaths, with projections or spurs on two adjacent corners. When placed in the camera for exposure these sheaths stand one behind the other, and are pressed forward by springs at the back in the usual way. The projections are formed on the lower corners of the sheaths and rest upon rails, for convenience called guide rails, one rail on each side and running from back to front of the magazine. The upper part of the front sheath rests against a top rail, which keeps the sheath from falling forward at the front end (*i.e.*, the end nearest to the lens); of these guide rails we provide two similar circular discs, mounted on a spindle which is capable of rotation about its axis between bearings which are placed so that the axis of rotation is parallel to the front of the plate and nearly on the same level as the lower edge of the sheath when in position. The discs are placed upon the spindle at such a distance from each other that the pins on the sheath shall bear against their edge when they are pressed forward by the back springs. In each disc we cut a notch of width and depth just enough to take the pins. When the discs are revolved until the notches and pins are opposite each other, the pins enter the notches, owing to the pressure from the back springs forcing the sheaths forward.

By means of a suitable thumb piece we impart rotatory motion to the discs. When the pins have entered the notches, the rotation forward of the discs carries the lower edge of the sheath forwards and downwards until the sheath is drawn from the top supporting rail, and falls forward into a receptacle provided for it.

The discs revolve inside circular rings, which encompass them so that the pins cannot leave the discs until they arrive at a given point where the outer rings terminate, when they drop out, and the now released sheath falls into the receiver. The thumb piece is then rotated back to its normal position, when the pins of the next sheath (which meantime have been bearing against the edges of the discs) enter the notches ready for the next exposure. The removed sheaths fall into a receiver, which for one of its sides has an arrangement called a gripper. By an automatic arrangement connected with the thumb piece this gripper is moved out of the way to allow the sheath to fall into the receiver, and, when the thumb piece is returned to its normal position, the gripper is pressed by a spring and caused to bear over against the sheaths, thus preventing them from shaking about in the camera.

It is unnecessary to describe the other parts of the camera to which this invention may be applied, as it can be adapted to many of the forms of camera now on the market.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
1	Camera Club	
1	Central Photographic Club	*Exposure.* Alfred W. Dollond.
1	Peterborough	
1	Richmond	
1	South London	
1	Stereoscopic Club	
2	Birmingham Photo. Society	
2	Bolton Photo. Society	
2	Brixton and Clapham	
2	Exeter	
2	Hackney	Open Night.
2	Herefordshire	
2	Keighley and District	
2	Lewes	
2	North London	
2	Oxford Photo. Society	
2	Paisley	
2	Rotherham	
2	Sheffield Photo. Society	Annual General Meeting.
2	West London	
2	York	
3	Croydon Camera Club	Inauguration of Winter Session.—*A New and Simple Enlarging Apparatus.* G. R. White.
3	Edinburgh Photo. Society	
3	Leytonstone	
3	Photographic Club	*Photo-micrography.* Andrew Pringle.
3	Southport	
3	Southsea	
4	Birmingham Photo. Society	
4	Camera Club	
4	Dundee and East of Scotland	
4	Glossop Dale	
4	Hull	
4	Leeds Photo. Society	*Flashlight Photography.* J. H. Walker.
4	London and Provincial	*The Fish Glue Photo-engraving Process.* Henri Calmels.
4	Oldham	
4	Tunbridge Wells	
5	Brighton and Sussex	
5	Cardiff	
5	Central Photographic Club	Annual Meeting.
5	Croydon Microscopical	
5	Holborn	
5	Leamington	
5	Maidstone	
5	North Kent	
6	Central Photographic Club	Visit to Mr. W. Wray's Optical Works.
6	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

September 25, Technical Meeting,—Mr. Andrew Pringle, F.R.M.S. (Vice-President) in the chair.

The meeting was held in the gallery of the Exhibition, and was devoted to an explanation of the apparatus now on view there.

Mr. James A. Sinclair explained the exhibits of Messrs. Adams & Co., including the Vesta camera; the view-meter, which is now fitted with blue glass; and the new finder, which has openings for vertical and horizontal views.

Mr. R. CHILD BAYLEY explained Anderton's system of stereoscopic projection, for which a medal has been awarded; also Watkins' eikronometer.

Mr. SHEW explained the various exhibits of Messrs. Shew & Co., which include the Featherweight camera—a half-plate, in the construction of which aluminium is extensively employed, only weighing seventeen ounces, other exhibits being the focal-plane Eclipse camera, having the shutter constructed in the camera; the Shewgraph changing back, for films or plates; an Eclipse hand camera, fitted with Dallmeyer's tele-photo lens; and a Goerz lens, fitted with a quick-acting central shutter in the diaphragm slot.

Mr. T. R. DALLMEYER, in referring to the exhibits of Messrs. J. H. Dallmeyer, Limited, drew attention to the high power tele-photographic lens, which has an unsymmetrical reversible negative attachment, the adoption of a negative lens of this nature facilitating the use of the system for objects at greater or less distances from the camera. Referring to the Naturalist's hand camera, for which a medal has been awarded, he pointed out the delicacy of the shutter-release, and said this would conduce to steadiness. He did not think there would be any more difficulty in holding the camera steady than was the case with an ordinary hand camera. Alluding to the Hepworth vertical camera stand, he said he thought thanks were due to Mr. Hepworth for drawing attention to a neglected field of photographic work.

Major LYSAGHT explained his hand camera, which has a full-size finder on the reflector principle, the uncovering of which at the same time actuates the iris diaphragm and opens it to its largest aperture.

Mr. THOMAS SAMUELS showed and explained his new changing back for holding twenty-four 10×8 films; the sheaths hold the films at all four sides, and the lifting arrangement is simple and certain.

The various exhibits of Messrs. B. J. Edwards & Co. were shown and explained by Mr. W. H. Barnes.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 20,—Mr. R. P. Drage in the chair.

The HON. SECRETARY invited members to contribute slides for a collection to be shown by members during the Exhibition of the Royal Photographic Society.

PHOTOGRAVURE.

Mr. HORACE WILMER read a paper on this subject, followed by a practical demonstration, which he had already given before the Royal Photographic Society and the Photographic Club.

In the course of the paper Mr. WILMER dealt with the class of negative and transparency most suitable, reversed transparency required, masking, &c.; printing of negative resist, tissue most suitable, time of exposure, and precaution necessary in developing same on copper, trial resist necessary to determine exposure; copper plates, quality, cleaning the plate, &c.; description of grain employed and the function of the grain, graining box, precaution necessary to avoid damp, methods required to control character of the grain; heating the grain on the copper plate, colour by reflected light an important guide as to when sufficiently heated; drying off the developed resist by artificial means or spontaneously (the latter necessary where a resin grain is used), varnishing and forming protected margins; preparation of etching solutions, best strength to use, neutralising the etching solution; etching, the solution to be used determined by inspection of trial resist, time of etching; cleaning off the film, finishing of plate ready for printing.

The practical part of the demonstration was then proceeded with, cleaning the plate, graining, and the other operations being shown. Mr. Wilmer incidentally remarked that he purchased his copper plates at a cost of about a penny per square inch. He successfully etched a plate which, on the suggestion of Mr. Everitt, he consented to allow being printed for the members. He also showed some admirable examples of photogravure by Messrs. Waterlow and himself, and also several plates in various stages of preparation.

In the course of a short discussion which subsequently took place, Mr. A. L. HENDERSON suggested the application of the bitumen process to photogravure, as also the transfer of the inked image on the plate to porcelain, using a vitrifiable substance such as sesquioxide of iridium.

Mr. HERBERT DENNISON said he agreed with Mr. Wilmer that the process demonstrated that night might be improved by obtaining a method of graining in varying proportions to the depth of the shadows of the picture. Otherwise it seemed impossible, to him, to improve it. The difficulty of interpreting the high lights and deep shadows, and the danger of overbiting the shadows, could be got over in the three-etching process mentioned by Mr. Wilmer. By that process the results were better, but the process was beyond the reach of amateurs, for whom Mr. Wilmer's process was well adapted.

Mr. W. E. DEBENHAM inquired if means could be suggested for avoiding "devils" in the process?

Mr. DENNISON had no information to give on the point. He intended trying the use of copper deposited by electricity instead of the ordinary rolled variety; this might probably be purer.

Mr. EVERITT inquired why Mr. Dennison considered the three-etching process beyond the powers of amateurs.

Mr. DENNISON replied that the registration was very difficult, the plate having severally to be grained for the shadows; next, the half-tones; and finally, the lights, blocking out taking place as intermediate operations. If the registration was not exact in each case, it would show.

After other remarks, a cordial vote of thanks was passed to Mr. Wilmer.

PHOTOGRAPHIC CLUB.

SEPTEMBER 19,—Mr. E. Clifton in the chair.

The CHAIRMAN gave notice that at the last meeting of the Affiliation Committee the question had been discussed as to information that would be forthcoming from affiliated Societies towards preparing a guide-book for the benefit of all. He said that it was notorious that a man knew more of other neighbourhoods than his own, and the suggestion was made that a man should not be confined to giving information of his own.

Mr. Frank Haes showed a very fine collotype picture, 20×16, of Interlaken.

The CHAIRMAN read a communication from the Central Photographic Club *re* the Exhibition of Rejected Pictures from the Royal Society and Salon.

Mr. Kloss, representing Messrs. Clement & Gilmer, showed several novelties in the way of photographic apparatus. A very small camera, measuring about 7×6×5 outside, was capable of producing 4×5 pictures; carried within itself three double backs, had swing back, rising front. A half-plate portrait lens, with tele-photo adjustment, was capable of producing pictures in the studio from 7×9 up to 20×16. Sample photographs shown were voted excellent. Another camera, with a focal-plane shutter, was shown, but the button release was such that, in the opinion of those present, the pressure required would preclude the possibility of obtaining anything else but a fuzzytype.

Hackney Photographic Society.—September 11, Mr. E. Puttock in the chair.—Mr. GOSLING reported the preceding Saturday's excursion to Waltham Abbey. This, the last excursion of the season, had been a very successful one. Mr. RODER showed Brooker's backing, and spoke well of it. Work was shown by Messrs. Roberts, Norris, and Westcott. The Society having outgrown its present meeting accommodation, it was discussed, and decided, that more commodious premises should be obtained. Mr. HENRY CROUCH was then called upon, and gave a most interesting discourse on lenses, and illustrated his remarks with diagrams on the blackboard, He explained the principle of achromatising lenses, and said that prior to 1850 lenses were not corrected. The construction of the rapid rectilinear and the wide-angle lenses were dealt with, and also the new lenses—concentric, Zeiss, Goerz, &c. The introduction of the new Jena glass, of which there were seventy-two different kinds, put a new power into the hands of the opticians. Mr. T. H. SMITH asked if a five-inch Goerz lens would cover a half-plate sharply at full aperture. Mr. CROUCH, in reply, thought that a six-inch would be necessary. In reply to Mr. Gosling, he said that a single landscape lens, in comparison with a rectilinear working at same aperture, would be slightly more rapid on account of there being fewer reflecting surfaces. Mr. WESTCOTT asked what is the best way to clean lenses, and, in reply, Mr. CROUCH advised the use of tissue paper.

SEPTEMBER 18, Mr. E. Puttock in the chair.—Mr. HENSLER showed comparative results on mezzotype paper and matt P.O.P., and asked for an opinion as to which gave the better result. The opinion of those present was almost unanimously in favour of mezzotype. Mr. Beckett showed work done by concentric lens. This although advertised to cover whole-plate, yet covered a 12×10 well. The question, "Is there a ready way of telling when a gelatino-chloride print is properly fixed?" met with no satisfactory reply, the opinion being that it is impossible to tell; but, with regard to plates, Mr. BECKETT said that they would be properly fixed if left in the hypo solution double the time all soluble bromide took to disappear from the film. A discussion ensued on the question of large *versus* small stops as affecting photographic perspective. While varying the aperture of the lens did not affect linear perspective it was maintained by the Hon. Secretary and other members that a small stop destroyed aerial perspective, and produced flatness. Mr. GOSLING preferred the use of a small stop, as he considered that everything should be sharp, and he doubted whether stopping down a lens destroyed the effect of atmosphere.

North Middlesex Photographic Society.—September 24.—Mr. A. J. JOHNSON delivered a lecture on *Photography and the Printing Press.* He sketched the history of illustrated books from the time of the hand illuminator, through the period of wood and steel engraving, to the present time of process blocks, which have made illustrated journalism possible and now such an essential portion of our journalistic fare, explaining the different processes—the Woodburytype, the zincotype, the half-tone, the swelled gelatine, and other processes, bringing with him a vast quantity of specimens of the different kinds of work, with proofs in the various stages of their production and also the blocks from which they were pulled, together with the original drawings from which the blocks were made. As one of the subsequent speakers said, this was practically unknown ground to most present, the result being that they will look with much added interest on the illustrations in their magazines in the future. Mr. Arthur J. Golding was warmly congratulated on obtaining a medal of the Royal Photographic Society this year. In the competition for Waltham Abbey pictures, Mr. Marchant, the President, obtained both first and second places.

Brechin Photographic Association.—The Annual General Meeting was held in the Y.M.C.A. on Wednesday, the 19th inst., Mr. James Ireland in the chair. The office-bearers for the ensuing year were appointed as follows:—*President:* Mr. William Shaw Adamson, Careston Castle.—*Vice-Presidents:* Messrs. J. Ireland and J. D. Ross.—*Committee:* Messrs. A. Watson, W. Dakers, and J. Cuthbert.—*Curator:* Mr. D. B. Robertson.—*Treasurer:* Mr. James Mitchell.—*Secretary:* Mr. Alexander McLeod. After the usual business, there were exhibited for the first time the *People's Friend* Prize Slides, 1894, 100 Scottish views, which were greatly admired by a large and appreciative audience. The usual votes of thanks closed the meeting.

FORTHCOMING EXHIBITIONS.

1894.	
Sept. 28–Oct. 6	*Royal Aquarium.
,, 28–Nov. 14 ...	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
Oct. 1–Nov. 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.

November 12–17..... Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22..... *Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ... *Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1 *Stanley Show (Photographic Section).
,, 29–Dec. 1 *Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December..... *South London Photographic Society. C. H. Oakden 51, Melbourne-grove, East Dulwich, S.E.
1895.
March 25–30 ..... Brixton and Clapham Camera Club.
Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is tak of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHY IN COLOURS.

To the EDITOR.

SIR,—Photography in colours is an accomplished fact. Professor Joly, of Trinity College, Dublin, has just provisionally protected an invention of his for the above, and which consists of using a glass screen with the three primary colours divided minutely on its surface similar to a photogravure screen. This is placed in front of an iso plate in the camera, and exposed twice as long as it would be without a screen. Negative developed in the ordinary way, and a positive on glass taken from it. This has a coloured screen similar to the original one placed in front of the transparency. All the colours come out as in the original subject. Lantern slides can be made perfectly also. An opalescent vase was photographed with a black velvet background, and all the delicate tints came out perfectly. The cost will not be very high, a whole-plate screen for the camera costing only some 15*s.*—Yours, &c., W. R. KENNAN.

41, *Grafton-street, Dublin, September* 23, 1894.

DIRECT POSITIVES IN THE CAMERA.

To the EDITOR.

SIR,—I think it would be acceptable to many if you were, through THE BRITISH JOURNAL OF PHOTOGRAPHY, and otherwise, to invite contributions to the coming ALMANAC on the subject of direct positives in the camera. In such, extreme delicacy of detail should be obtained; if photography in natural colours is to come to be practicable at all, it would, I take it, require to be by a direct positive process; and, lastly, there are endless cases where only one copy of a picture is required.

What is wanted is a direct positive upon some very thin colourless transparent support, capable of being mounted upon dark-coloured card or paper. Not long ago Mr. Bolton raised hope in this direction by a communication on this subject to THE BRITISH JOURNAL OF PHOTOGRAPHY, but this hope was dashed by his not going beyond glass as a support. Perhaps he has now pushed his development of the idea further?—I am, yours, &c., A. J. CORRIE.

Belle Vue House, Gorleston, Great Yarmouth, September 23, 1894.

GLYCIN.

To the EDITOR.

SIR,—In your notice of glycin in THE BRITISH JOURNAL OF PHOTOGRAPHY for August 10, which I just now see, having been absent from Rome for two months, I note that, though your conclusions in general are quite in agreement with my own, you do not recognise the particular point in which I gave distinct importance to that developer. I have tried a series of comparative experiments of the greatest severity and exactitude, and have used up dozens of rapid plates to arrive at precise results, employing the focal-plane shutter and exposures of from one two-hundred-and-fiftieth of a second to one one-thousandth, and the invariable result was that glycin has a trivial advantage over all other developers except pyrogallol, though the difference was very slight between it and several others, probably not five per cent. As between it and pyrogallol there is none which I can see in their disposal of the feeble radiations, but there is a very great advantage in the very remarkable freedom from fogging which is characteristic of the glycin when there is a question of forcing the development of an insufficiently exposed plate, and there is a great superiority in the single case of a subject with strong contrasts, and when the exposure is at a minimum, so that the forcing the development with pyro tends to over-density of the lights. In this case the use of pure glycin is indicated above all other developers, since the lights are rarely over-intense before the faintest radiations are found out. This is the case, and this only, in which I consider the use of glycin to be indispensable. The rapidity of action may be greatly assisted by the addition of about one-third of a developer of metol, but I do not consider the slowness of the action of pure glycin to be an objection to it. The rapidity is regulated within certain limits by the strength of the solution of glycin, and I quite agree with the Editor in the conclusion that the potash and soda should be first dissolved (and, if convenient, in warm water), and the glycin then added.

I have never found any advantage in the use of even the least addition of bromide; and when the plate is in a sound condition, and is properly protected from diffused light, before and after development or exposure, there is no tendency to fogging, while the keeping power of the solution is, so far as my experience goes, quite unlimited if kept from the air. In this respect I differ from the conclusions of the Editor, and I think that if he will try the same system of comparisons with a series of plates of high sensitiveness with exposures of decided insufficiency, so that the utmost power of the developer may be employed, he will agree with me as to the relative power of glycin. It is of no use to try experiments with sufficient exposures, for the power of the developer cannot be exhausted in them. There must be an indication of the extreme limit of it by the insufficiency beyond. Tested in this way, I have repeatedly found that there was a slight advantage in the use of glycin in its developing power; as to its keeping power, I have solutions of glycin and metol, made last spring, in diluted strength, which I shall try as soon as I get time to resume my experiments again.—I am, yours, &c.,

Rome, September 22, 1894. W. J. STILLMAN.

CUTTING PRICES.

To the EDITOR.

SIR,—What do you think of this for cutting prices? You can get one dozen *cartes-de-visite* for 2*s.* 6*d.*, large vignette heads, good work, and nicely retouched, and the place is run by a representative of a well-known wholesale house, thus entering into competition with their own customers. I enclose my card, not for publication.—I am, yours, &c.,

September 24, 1894. A POOR PHOTOGRAPHER.

ANOTHER MYSTERIOUS NEGATIVE.

To the EDITOR.

SIR,—IN reference to your issue of August 17, Mr. Bland's negative seems to have been very similar to one I obtained in March last.

In December, 1893, I purchased from the Army and Navy Stores a box of Edwards's "Cyclist" whole-plates. Half of these were at once loaded into the slides, and brought out to India at the beginning of the year. I exposed the whole six in March last, and on one got a phantom distinctly portrayed. The picture I tried to take was a boy, mounted on his pony, but on development a mysterious old man, wearing cloth gaiters, and an old-fashioned wide-brimmed hat, appeared holding the pony's head. I showed the negative to one or two people and then broke it up.

Mr. Bland also got the old man and his ancient tile, and likewise on an Edwards' plate, so that probably there is an individual who answers to this description in the factory of Messrs. Edwards & Co.—Yours, &c.,

Madras, September 4, 1894. A. D. G. SHELLEY.

LEYTONSTONE EXHIBITION.

To the EDITOR.

SIR,—May we, through your columns, inform intending exhibitors at the above exhibition that Entry forms are now ready, and can be obtained from the Secretaries, Leytonstone Camera Club, The Studio, High-road, Leytonstone. We would specially draw attention to Rule 4 on the entry form, which is as follows: "Where a medal is awarded for a set of lantern slides, *ths negatives may be used for the production of prints for competition.* No competitor can, however, take two prizes of the same value, and any *one* picture cannot take an award in more than one class."

Our Council have long felt that the system of disqualifying six negatives, in cases where a set of lantern slides received an award, was an injustice to those who competed in several classes, and we trust the alteration will give satisfaction to exhibitors.—We are, yours, &c.,

F. W. WATES }
G. H. CRICKS } *Hon. Secs.*

September 24, 1894.

Exchange Column.

Will exchange one portable symmetrical No. 7 for one Marion's whole-plate portrait lens; difference adjusted.—Address, A. LISTER, Photo, Darwen.

Wanted a good mandoline and case in exchange for three Victoria lenses.—Address, G. F. W. WALMSLEY, 4, Woodville-terrace, Breck-road, Liverpool.

Wanted a 12×13 rapid rectilinear or rapid symmetrical in exchange for a fine half plate Ross portrait lens.—Address, J. PEACH, 117, Great George-street, Liverpool.

Wanted, in exchange for solid-tyred safety bicycle, Lancaster's half-plate Méritoire or similar set.—Address, LOUIS DE POITIERS, 6, Foskett-road, Fulham, London, S.W.

Will exchange an Optimus full-size japanned oil lantern, 50 slides, and sundries, for lessons in retouching and working up bromides by post.—Address, GEORGE MOORE, Buckfastleigh, Devon.

Studio camera, whole-plate, mahogany, bellows about forty-two inches, swing back. Two slides and copying stage: will exchange for hand or field camera.—Address, D. P. PRIMROSE, Post Office, Fawcett-street, Sheffield.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

H. Faulkner White, Exeter.—*Photograph of Water-colour Drawing, entitled, "The Gentle Huckle."*

L. Varney & Son, Buckingham.—*Portraits of H.R.H. the Prince of Wales, Duc d'Orléans, and Gentlemen-in-Waiting.*

John L. Sanford, Sandy.—*Three views of High-street, Sandy, and a view of Sandy Station on Flower Show Day, August* 30, 1894.

J. WALSH.—We forwarded your letter to the person named.

CHROMO.—We know nothing of the special ink mentioned beyond the fact that it, or something very similar, is now sold universally. Even Judson's dyes with a little glycerine added will answer well.

E. WHITEMAN.—The work about which you inquire was published by Longmans, and has, we believe, been out of print for many years. A copy may possibly be obtained through an advertisement in the columns devoted to that purpose.

B. VIVIAN.—1. Crease, Cow Cross-street. 2. According to the temperature, until the solvents of the varnish are driven off, which experience will indicate. 3. Felt or flannel. Finish with wash leather. 4. Tunny & Co., of Edinburgh, we believe, supply enamel phototographs.

SIGMA.—The limelight is quite sufficient for enlarging on bromide paper, even when working on a commercial scale; but, if electricity is available from a main, it simply becomes a matter of convenience and expense as to whether the limelight or the electric light is the preferable for you to adopt.

N. E. W.—Better consult a respectable patent agent, and get him to make a search as to what has been done before. Or you may do it yourself in the library of the Patent Office. It will require a great deal of ingenuity to frame a really valid patent on changing arrangements with hand cameras.

H. BENYON.—Ebonite might be used for the mounts of photographic lenses, but it offers no advantage over metal, except its lightness, while it would be far more liable to injury. We much doubt, taking the thickness that would be necessary with the suggested material, if the mount would be any lighter than one of aluminium.

R. GODDARD says: "Would you kindly inform me where I could buy some of the Japanese lantern slides of which frequent mention is made in your JOURNAL?"—Possibly a letter addressed to Mr. D. S. Brearley, care of The Central Photographic Club, Henrietta-street, Covent Garden, would elicit the desired information.

XENO.—The reason of the thinness of the negative can be fully accounted for by the unusually small proportion of pyrogallic acid in the developer. Increase that to two or three grains to the ounce, and no doubt sufficient vigour will be secured without difficulty. The negatives already developed can, of course, be intensified.

PROCESS.—We cannot say, unless it is because the screen method is preferred by those who want the blocks. The example enclosed is very good, but you will scarcely claim for it that it is better than a screen block of equal merit, so far as execution is concerned. Possibly the reason may be that printers prefer the latter to work, and publishers for the results.

C. RICHARDS.—The "curling propensities" of collodio-chloride paper can generally be combated by immersing the prints, as they come from the frames, in tolerably hot water—say, from 100° to 110° Fahr. After this treatment they will, with most papers, be as comfortable to work as prints on albumen paper. The sulphocyanide toning bath is the one generally preferred for this paper.

T. S.—1. You had better get an elementary work on the subject, such as Burton's *Printing Processes* (Marion & Co.), or Wilkinson's book. 2. Any work on photography, published a dozen or more years ago, will give full details of the wet-collodion process. Hughes' or Abney's works are amongst the best. Space is far too limited in this column to give such elementary details.

REX.—We do not see where a patent can lie for any arrangement of lights. See what is claimed in the existing patent. In future address your letters as directed in nearly every number.

SNAPPER.—It is impossible to judge of the quality of the lens from the prints sent, as in every case but one the camera was manifestly moved during the exposure. In the one exception the lens was a long way out of focus, so from that no opinion can be formed. It does not follow that because a so-called "fixed focus lens" does not yield sharp pictures that it is faulty. It may be that it has not been fixed in accurate focus on the camera.

T. R. W.—Your trouble is like that of many others who use the acetate toning bath, when the same solution is employed over and over again, with some ready-sensitised paper now in the market. The only thing we can suggest, when these papers are used, is to make up a fresh bath, the day before, for each batch, with only sufficient gold in it to tone the prints, or to immerse the prints in a dilute solution of carbonate of soda, to neutralise the acid these papers usually contain, and then washing out the excess of alkali before commencing to tone.

A. T. B.—Whatever may be your reading of the Building Act, and we have an idea you are not quite right on the subject, we should not advise you to build in defiance of the District Surveyor, or you may, in the end, have to take the structure down. At least, we should recommend you to obtain legal advice from a solicitor well versed in the building law before incurring much expense. As a matter of policy it is better to appease district surveyors than to defy them, for, as a rule, they are better versed in the law that concerns them than are laymen.

T. B. writes: "Kindly give me your opinion as to the cause of spots on the enclosed photographs. There were none on when mounted, but they developed during the time it took to complete the order—say, about a week or ten days. As far as I can find out, the prints seem to have had the same treatment as usual?"—The spots of the kind in question may be due to several different causes, such as the mounts, the mountant, the hypo-sulphite of soda, the manipulation, &c.; or, maybe, to floating particles of pernicious matters in the atmosphere, and coming in contact with the prints when in a moist condition.

SIDE-STROKE says: "Would you be kind enough to inform me if the photographs of children by Mrs. Cameron are considered of any value? I have two portraits of children, large heads, 12×10 size, mounted on large mounts and signed. They are evidently taken on wet plates, are in splendid condition, and appear to be about twenty or twenty-five years old. Can you inform me their probable value?"—We do not think that the pictures would be worth more than a few shillings, but possibly Mr. H. H. Hay Cameron, of Mortimer-street, W., would give you a definite idea on the point.

FIXED says: "I have a studio of which the end wall, used as a background, is fourteen feet wide, twelve feet to ridge, and six feet to eaves. The glass on north side of roof commences four feet from the end, and when taking a group or standing figure the corners where roof joins walls are darker than the other part of background and show badly on prints. Are there any means of remedying this defect without altering studio?"—If the whole of the background extreme height and width is included in the picture, it must necessarily show where it is shaded, unless it is illumined by a direct front light, when the portrait will suffer. A judicious shading of the background always enhances the pictorial quality of a portrait, and that our correspondent should study, and turn his supposed defect to advantage. Flat, even backgrounds have for many years been rightly looked upon as an abomination.

MONMOUTHSHIRE writes as under: "I enclose three photographs, as you will see, fading. Would you kindly tell me the cause of it? I have been using the borax bath lately; I have also just had in a fresh supply of blotting-boards. Thinking it may be carelessness on my printer's part, last night I did the whole of the toning, fixing, and washing myself, with the same result. If you will kindly assist me, I shall feel obliged. I enclose sample of blotting-board. 2. Also, would you kindly tell me how it is the acetate bath is so long toning? That is the reason I changed from the acetate to the borax toning bath. I use ready-sensitised double albumen paper. If you would kindly give me a reply in your next issue, you would very much oblige."—1. The prints are mounted, but our correspondent does not say at what stage the fading patches first made their appearance. At first sight they seem to be due to faulty manipulation, such as the fixing bath too weak, too short an immersion, or the prints sticking together while in the solution. But this can scarcely be the source of the trouble in this case. Before giving an opinion we should like fuller particulars. 2. Without knowing how the paper is prepared, we cannot say the cause. But it is an undoubted fact that, with some brands of ready-sensitised paper, there is great difficulty in toning with the acetate bath. Other brands tone readily enough.

*** Several answers unavoidably held over to our next.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1796. Vol. XLI.—OCTOBER 5, 1894.

PAPER NEGATIVES.

In the face of all we have previously written concerning the manifold advantages accruing from the employment of celluloid as a support for sensitive surfaces on which to produce negatives, and not one word of which we would now retract, it still does appear to us that, more especially for the larger sizes, it would be desirable if manufacturers would add to the many benefits with which they have favoured us by coating paper as well as glass and celluloid with bromised gelatine as sensitive as that now employed in the preparation of the other two substances named.

We are perfectly aware that paper of an extremely sensitive nature was at one time procurable as an article of commerce, as it still is, and we hope will continue to be, for printing enlargements and other pictures by artificial or feeble light; but what we now desiderate is the resumption of its preparation for rapid camera work.

Why was its manufacture discontinued? In a large measure, we think, owing to photographers desiring something more transparent than paper through which to print, paper undoubtedly stopping the transmission of light and thus increasing the time of printing. Another reason, rather more imaginary than real, was to be found in the possibility of the texture of the paper showing itself in the print.

Happily we possess several emulsion paper negatives taken several years ago, while as yet the place of paper had not been wholly usurped by celluloid, and we have subjected these to experiment with a view to discover the influence and extent of the opacity of the paper and the visibility of texture in the prints. The result is encouraging, and more than sufficient to warrant our indulging the wish already expressed that manufacturers would again give at least a tentative attention to this method by placing some sheets on the market.

To render paper negatives more transparent there have been many things utilised, such as wax, oils, gums, and varnishes of various kinds, and of these some are very much better than others. Assuming paper to be made of cotton rags, it is evident that a gum possessing a refractive index near to that of the fibres of cotton will, if surrounding such fibre, cause it to be invisible or nearly so. We all know that, if a thin sheet of paper be immersed in certain liquids, benzole, for instance, it immediately acquires a very high degree of transparence, which, however, fades away as the fluid evaporates until the paper eventually resumes its original opacity. Now, what is required is to fill the pores of the paper with something that will cause it to retain its transparence, yet which shall become quite dry.

A solution of Canada balsam in turpentine very nearly fulfils this condition, but it is a very slow drier, and, as it becomes dry, the solution has to be applied again and again By employing benzole as the solvent instead of turpentine, the difficulty of drying is largely overcome, and, aided by heat, we have imparted such a degree of translucence to thin foreign post as to enable us to read rather small print through it when the two were placed in contact.

Gum copal has been found to answer somewhat better than other gums or resins. There are three kinds of copal varnishes easily procurable at the oil and varnish stores; they are respectively known as oil, turpentine, and spirit copal. It is to be regretted that the first two take a very long time to dry. On one occasion we were three days in getting a sheet of paper brought to a state of transparency by the turpentine variety, applying coat after coat, until the paper was unable to absorb more, and it remained glossy on the surface. But the result was so beautiful as to well repay the time and trouble spent upon it, and amply to justify every endeavour to reduce the time of its becoming dry.

In an alcoholic solution of copal we believe will be found the clearing agent to be preferred for paper negatives. This dries quickly, and the requisite number of coats may, therefore, be applied, one after the other, without loss of time.

The operation is rendered more successful if the size is removed from the negative. To do so with plain paper is very easy, all that is necessary being to lay the paper in a flat dish, and pour over it some hydrochloric acid, allowing it to remain for a few seconds. The acid is then poured off, and the paper washed until the water ceases to turn litmus paper red. But in the treatment of a paper negative this cannot be done with quite the same impunity. We have found, however, that, by pouring a little of this acid upon a glass slab, and laying the negative, face up, upon this, the size is quite removed, certainly so from the back of the negative, which is all that is wanted. This is effected without any deterioration of the negative. To ascertain what effect would be produced were the negative image itself to be exposed to the action of the acid, we poured over the face of a glass gelatine negative some of the ordinary hydrochloric acid of commerce, and allowed it to remain on for a much longer period than sufficed for removing the size from the back of a negative on paper, and

found that the glass negative was quite unaffected. From trials made at the same time, with this acid acting directly upon printed-out and developed prints on gelatine paper, we arrived at the conclusion that, as the latter resisted the destructive power of the acid much better than the former, developed prints, if properly made, had a better chance of a long life than printed-out ones.

Having shown that paper negatives may be rendered as transparent as is requisite for quick and grainless printing, and possess advantages equal with those on celluloid, it remains for manufacturers to prepare and supply the demand for bromised paper of such exalted sensitiveness as to be suitable for rapid exposures in the camera. We know of many photographers who have expressed a desire for such a commodity, having the flexibility of celluloid without its high price.

COMMERCIAL PHOTOGRAPHIC PROGRESS AT HOME AND ABROAD.

It is well at times in all trades and professions to "take stock," and see whether we are advancing or otherwise, and that of photography should not be an exception. That it is making rapid strides in every direction there is no question. But, notwithstanding that, it will still not be amiss to inquire if it is making all the progress that is desirable; also whether it is advancing in this country to the same extent, commercially and otherwise, as it is in some of those abroad. The time for this is opportune now that there are so many Exhibitions open in the metropolis, as they may afford us some instruction on the subject. These, one and all, show that, so far as photography itself is concerned, England is not behind, and, what has always been conceded to it, that in landscape work we are far ahead of every other country, while in portraiture and *genre* subjects we are well to the front. The point we shall here deal with is not what may be termed the æsthetic phase of photography, but the commercial element of it and its numerous applications, the mechanical processes amongst others.

At one time, and not so very long ago either, a very large amount of collotype work used to be sent abroad for execution, for the simple reason that it could there be obtained better and cheaper than it could be done at home. One cause for that was that, on the Continent, the greater part of the printing was down by power presses, while in this country collotype printing was restricted to hand presses. However, some enterprising firms in England eventually installed collotype machines, and their example was quickly followed by other houses, with the result that now one seldom sees a collotype bearing the imprint, "Printed in Germany," or elsewhere.

What has just been remarked with reference to collotype holds also with, from a business point of view, perhaps the most important of all photo-mechanical methods—half-tone process blocks. A few years back, when anything special was required by the illustrated press, the work was almost invariably sent to Germany or Austria for execution, because satisfactory blocks of home production were not obtainable. The case is widely different at the present time. A glance through the Exhibition at the Royal Aquarium shows that British process work is second to that of no other country. Perhaps a still more practical and conclusive proof of the excellence of English process work than that of Exhibition specimens is the blocks bearing the names of British firms to be seen in the various illustrated journals and magazines. One rarely now sees the names of Continental producers on that class of work. All this speaks well for British advancement.

There are other profitable directions, however, in the art in which we should like to see greater energy displayed; in colour work, for example. In this we are forced to admit we are not yet to the fore. In the Exhibition just named there are some examples—and very promising ones too—by the three-colour method; but the best of them, from a commercial point of view, are, for size and quality, behind the majority of similar work produced abroad by other and, at present, more practical means. We have in our mind just now some very fine reproductions of modern pictures in colour, issued by some French and German houses. The three-colour process may be theoretically the best, but clearly, up to now, other methods of producing the work have a greater commercial value, and that is really the question that we have immediately before us.

There is another direction, which, by the way, is purely photographic, and is also a very profitable banch of photography, that seems to be almost neglected in this country, namely, the reproduction of works of art. This branch of photography appears to be, so far as the production is concerned, almost entirely confined to Continental firms, though the reproductions have a ready sale here. If it will pay foreign houses to send staffs of operators here and erect studios to photograph the pictures in our Royal and National collections, as well as those of other countries, for sale here and elsewhere, one would surmise that it would pay English houses to do the same. In a catalogue of a Continental house, having an agency here, now before us, we find copies of paintings from every European gallery, as well as the following English ones:—National Gallery, Windsor Castle, Buckingham Palace, Hampton Court, South Kensington, Chatsworth, Oxford, &c. Other Continental firms have similar catalogues and also agencies here. These reproductions are in various sizes, up to about thirty inches, and are printed in carbon, and some by photogravure.

These houses do not, however, confine themselves to the old masters, as they also do a large business in reproductions from modern works. We are given to understand that these firms periodically visit this country in the spring for the purposes of buying the copyrights of paintings in the various Exhibitions then open. The pictures, of course, are copied abroad, and the reproductions find a ready market here at high prices, as compared with those at which English landscapes of similar dimensions are published.

On the whole, excepting in the directions just referred to, we may congratulate ourselves that we are fairly abreast of the times; but we must not be content to rest where we are, because, although we are rapidly advancing, we must bear in mind that other countries are doing the same.

"Where are the Snap-shotters?"—The *English Mechanic* suggests such a question in calling attention to a recent visit from an old and almost forgotten friend—the sea serpent. "It is argued pertinently," says that journal, in speaking of the reports of credible witnesses, "that, if these bold marines were afraid to shoot one of the monsters, there is no reason why they should not have taken a snap-shot at him with the camera." We have just one remark to make in this connexion: it is to be hoped that, if any one does try to

snap-shot the monster, he will take care to focus him accurately, or photography will produce results which will not be the "witness of truth."

Photographs of Lightning Flashes.—In the lecture on Physics at the American Association for the Advancement of Science, reference was made to this subject, and it was stated that in one month—June, 1894—one hundred people were killed by lightning in the United States. It was therefore felt desirable to accurately learn as much as possible about the length and form of the path of the lightning. Mr. McAdie had three cameras at work, all pointed to the top of the Washington monument in the city of that name. His desire was to obtain three simultaneous photographs of any particular flash, but, though he had been trying since May, he had not not yet succeeded. It appears to us that investigators in this direction would gain most valuable information if they worked with twin-lens cameras, and examined the image in a stereoscope. The cameras might be set, say, a dozen feet apart; then, with a flash that occurred within a hundred or two yards, the results from a single camera would give stereoscopic effect, while, if the flash that impressed its image were a mile or two away, one image from each of the distant cameras would be best. It need scarcely be pointed out that all four lenses should be of the same focus, and also that they should be well levelled, so as to ensure ready coalescence in the stereoscope.

The Infra-red Spectrum.—Professor Langley has lately presented to the Paris Academy of Sciences a paper on this subject, describing a new mode of registering the various rays by photographic agency. His bolometer is the instrument employed, but in a manner that is almost automatic, with a sensibility so great that, if they existed, the position of rays counted by hundreds might be recorded by the new method. Clockwork of great delicacy is made to pass the rays over the sensitive ribbon of the instrument, and the deflection of the galvanometer was formerly shown to the eye upon a scale. There is now substituted for this scale a sensitive photographic plate, moved in a vertical direction by the same perfect wheelwork which passes the spectrum over the bolometer. It follows that the curve of energy is registered in a perfectly automatic manner by means of photography, with the aid of the bolometer, in regions hitherto quite inaccessible to photography alone. Professor Langley points out how, by this new means, not many dozens, but thousands, of deflections, corresponding to Fraunhofer rays of the visible spectrum, may thus be registered, and we can now obtain with precision, in an hour, results which could not be obtained with the micrometer, even at the cost of many years of arduous work. Every care is taken to eliminate any possible error, and, when the infra-red spectrum is examined, it is shown to contain as many lines as does the visible spectrum, two thousand rays being indicated by the new method in this region alone. The map of this hitherto unknown portion of the spectrum will be shortly published.

THE PHOTOGRAPHIC SALON.

The second Exhibition of the Photographic Salon opened to the public on Monday last. Having defied the slings and arrows of outraged photographic technique for a year, there is, we suppose, a possibility that, after all, the Salon has come to stay—that, in fact, it will be always, or at any rate annually, with us. If there is something in this prospect that makes us shudder, there is, on the other hand, a very great deal which induces us to wish the enterprise every prosperity. Last year, on the occasion of the first Exhibition, we felt it our duty to animadvert upon the circumstances that surrounded the institution of the Salon, but we endeavoured to recognise the remarkable merit of most of the pictures which constituted the display. This year, while still lamenting the fact that it has been found desirable to supplement the old-established Exhibition of the Photographic Society by one of a less catholic character, it also falls to us to congratulate the Committee of the Salon on the success that has attended their efforts. The Exhibition now on view in the Dudley Gallery is every whit as good, as interesting, and suggestive as its predecessor. Indeed, if we could only persuade the General Committee to let us remove about thirty of the exhibits from the walls, allow us to place a foot through each of them, and make a bonfire of the *débris*, there would remain no hindrance to our perfect appreciation of a superb collection of delightful photographic pictures. But there's no such luck, we fear.

Judged by its aim and the result thereof, the Salon has in a great measure justified its existence. That aim is thus officially defined: "The aim of the Exhibition is to exhibit only that class of work in which there is distinct evidence of personal artistic feeling and execution. The desire of the promoters is to show the flexibility and range of adaptability which are possible in photography, and to exhibit its powers as a personal art in contradistinction to the attributes of mechanical accuracy and subservience to scientific fact which have hitherto been, for the most part, its best-known characteristics."

Nobody will deny to most of the works shown, both last year and this, the possession of a greater or less degree of pictorial merit. But it is tolerably certain that some of the methods of expression selected will have to wait a long time before successfully appealing either to the æsthetic or reasoning faculties of the class of people to whom the Salon addresses itself. Most of us require a lot of educating up to the "scene-painting" style of treatment that is the characteristic of more than one prominent exhibitor at the Salon.

The Exhibition this year consists of about 250 frames, sent in by ninety-nine persons, of whom, roughly, one-third are also represented at the Royal Photographic Society's Exhibition. Much taste and care has obviously been expended on the hanging, the *coup-d'œil* of the gallery being very charming. Eccentricity in the way of framing is slightly rife; in some cases the proportion of frame to picture is unnecessarily and ridiculously large, and the severe simplicity of boards stolen from the top of the fowl-house and painted green or black, has had its fascinations. Viewed as a whole, richness and warmth of colour are agreeably prominent, and the walls present a quite unphotographic appearance. Wide variety in the selection of printing surfaces abounds, ranging from surface silver paper to fabrics fine and coarse, rough-surface platinum, and carbon, &c., and it is easy to note a general striving after the production of effects resembling those obtained by crayons, wash drawings, and black-and-white sketches, while the imitative faculty has been cultivated to an even greater extent by others, who have sought, and not wholly without success, to obtain results bearing a resemblance to those of oil and water-colour painters. Above all, there is scarcely a single picture shown here which does not unmistakably indicate that it is the outcome of thoughtfulness and imagination, or give proof of a sincere attempt to produce artistic effects by means of photography.

In good land, sea, and cloudscapes, as well as in figure studies, the Exhibition is rich; but we were specially struck with the masterly quality of the portraits. These alone are well worth seeing and thinking about. There are not very many of them, but they are good in the truest meaning of the term. They are perhaps best described as possessing in every sense what the over-retouched, soulless, badly posed, woodenesses that pass for "portraits" nowadays do not—that is, life, character, individuality, and power. Were it not that, when he came to stand before some of the exhibits of Mr. Maskell, Mr. Davison, and Mr. Bryant, he possibly "would not know where he was," we should advise every professional photographer to go and study the portraits at the Salon. They are an education in themselves and cheap at a shilling.

Nothing better is to be seen here than a series of four large rustic studies by Dr. Hugo Henneberg, depicting *Sheep-herding* (No. 5); *November* (No. 6), a beautiful group of silver beeches; *Landscape* (No. 7), the combination of river and landscape being very happy; and *Evening Calm* (No. 8), a view of an old homestead under an evening sky. There is real poetry, allied with complete command of the means adopted, in Dr. Henneberg's work. Mr. T. Manly shows *Little Miss Muffet* (No. 1), a pretty study of a child; and Mr. Tom Bright's *Road from the Quarry* (No. 4) is a happy little effect of crispness. Mr. J. M. C. Grove has two river views (Nos. 12 and 13), of which the latter—*Nightfall*—is singularly effective. In Mr. Victor Selby's *Indian Juggler* (No. 15) the disposition of the figure and the

management of the light and shade is successful. We do not like Mr. E. Calland's *Portrait of Mr. W. T. Peters* (No. 17). It is the vague, indefinable representation of a frizzy-headed young man, no doubt "after" somebody. It has already been published in the *Studio* and, if we mistake not, other papers. The same gentleman has a tree study, *Woody Pastoral* (No. 21), scarcely forcible enough in the scale of gradation to comply with our tastes. Very true in suggestion is Mr. L. C. Bennett's *Grey Day* (No. 26), a steamer lying in the river. Mr. Adolph Meyer has a good study of a lady's head (No. 25), apparently in red carbon; and a similar subject that looks like a photogravure, is shown by M. Widimsky. Mr. Charles Emmanuel's pretty little *View of Tenby* (No. 27) bears a strong resemblance to Cromer. *In his Element* (No. 30), by Mr. F. W. Gauntlett, shows a fisherman in the water. The figure is virtually a *silhouette* on a delicate white ground. *Across the Common* (No. 35), by Mr. Rowland Bryant, is a snow study, the wide expanse of foreground being dotted with foot-tracks. There is an attractive and understandable delicacy about this work which is unfortunately absent from Mr. Bryant's other efforts.

Mr. Charles Job's *Stormy Sunset* (No. 34) is extremely good, but we do not understand his *Early Morning, Richmond* (No. 37), as the shadows at the sides of the picture looked too pronounced for the effect claimed to have been obtained. Much minuteness and delicacy characterise two small female figure studies by M. R. le Begue, *Le Bouquet* (No. 40) and *Femme Drapée*. Mr. Alfred Maskell has a corner space all to himself: *Landscape with Figures* (No. 45) and *Marshes at Vange* (No. 48) are freely translated landscapes, with strongly contrasted effects of light and shadows. His small pictures, *The Barge* (No. 42), *Round by the Mere* (No. 43), *At South Walsham Staithe* (No. 44), *Wind-blown Trees* (No. 46), and *Sailing Lighter* (No. 47), do not look as if made by photographic agency. They resemble work produced by black crayon, and are sombre to excess. Mr. A. Horsley Hinton's pictures strike us as having a more decisive style of treatment than sometimes characterises his work. *Dawn* (No. 55) is a capital plum-toned study; *In the Thames Estuary* (No. 56) is a vigorous rendering of broken-up ground and river-side flats; and *Twilight Grey* is a clever attempt to suggest the descent of the evening grey over a tree-studded landscape.

Mr. H. P. Robinson takes this year a new departure. His *Storm Clearing Off* (No. 60) is a remarkably fine effect of clouds lifting above a flock of sheep; and in *Midday* (No. 62), a rugged bit of landscape topped with an expanse of grand clouds, he also presents another fine piece of work. *Ready for the Collier—Morning* (No. 61), a group of men, with a cart in the background, shows the sun to be rather high in the heavens for "morning." Mr. Birt Acres' *Silvery Ripples* (No. 63) is a duplicate of his Pall Mall exhibit. More in sorrow than in anger do we entreat Mr. Harold Baker to stick to portraiture, and not let loose upon us such enigmatic blurs as that called *Evening* (No. 64) which he hangs here. It is too nebulous and brumous for our comprehension. Of Mr. Horsley Hinton's remaining three frames, commend us to his *Wallasea* (No. 70), a fine, bright view with cattle.

Of the two portraits shown by Mr. F. Hollyer, that of *Mrs. Patrick Campbell* (No. 73) stands out as remarkable for its character and fidelity. The gifted impersonator of Paula Tanqueray here lives again, and almost speaks to us from Mr. Hollyer's frame. Besides contributing a number of dainty little pictures (presumably in photogravure) depicting monks, views in Venice, and Italians in rural scenes, Mr. J. Craig Annan, who is the most prolific contributor to the Exhibition, also sends some larger work, illustrating, among other subjects, *A Lombardy Pastoral* (No. 93), sheep in the foreground, with mountains in the distance; a view on the quay at *Genoa* (No. 97); and *The Adriatic* (No. 98), fishers on the seashore. The series is a grand one, and Mr. Craig Annan further demonstrates the possession of varied powers in his *Portrait of a Lady* (No. 95), the head of a venerable lady being sympathetically fine. A word of praise is due to Mr. F. L. Pither for having successfully evaded the conventionalities of photographic exhibitions. He shows *The Building of the Ship* (No. 92), and well depicts all the bustle and stir of the shipyard. Mr. Pither's taste in framing is exceptionally refined.

To Mr. W. Crooke in all probability will be accorded the credit of having sent, perhaps, the most meritorious contribution. *The Warrior* (No. 102) is a portrait of a man in armour, masterful alike in treatment and expression. It looks like a superb reproduction of a fine painting. We should like to know how Mr. G. Thornycroft produces the effects of colour in his *Sunrise on Lock Shell* (No. 103)? The print bears a suggestion of crimson that is possibly not secured by photo-chemical means. Mr. Hay Cameron has several portrait studies of somewhat unequal merit. Rev. F. C. Lambert's *River Fog after Sunset* (No. 116) quite "fills the bill" in the matter of realism, which is more than we can say of many other similar attempts here. In *Sweet Home* (No. 117), *Portrait of My Father* (No. 118), by R. Eickmeyer, jun., and *On the Derwent* (No. 119), by Bernard Lintott, we meet some old friends, the gems of the last Newcastle and Bristol Exhibitions respectively. Besides other good things, Mr. J. B. B. Wellington also shows his noble Pall Mall effort, *Solitude* (No. 138). Mr. Gambier Bolton's *Companions in Arms* (No. 123), monkeys taken from life, is a remarkably clever photograph. The large portrait *Study* (No. 129) of a girl, by Mr. Burchett, is a graceful piece of portraiture, not, however, equal to this gentleman's former efforts; and why the pinky colour of the lights?

Mr. Bergheim this year excels all former efforts, and seems to be emerging, and we hope permanently, from what we look upon as a mannerism of mistiness that sometimes characterises his portrait work. Why, included among his magnificent exhibit there are at least two pictures which seem to us to have been taken with a well-corrected rectilinear combination, and the results in themselves are charming art studies. *Miss Innocence* (No. 130) is the large and pleasing portrait of a young lady, who again appears in *Alone* (No. 131) with a mournful expression. *Mevrouw Van Leeuw* (No. 132) is another superb portrait of a lady, pose and treatment showing skill and firmness well adapted to subject. *Day Dreams* (No. 135) is another capital study of two ladies happily grouped. A group of three ladies having a *Friendly Gossip* (No. 136), and other two enjoying *Musick* (No. 137) at a piano, are delightful "at-home"-like efforts, and flawless from the purely photographic point of view. *The Penitent Magdalen* (No. 133) will possibly attract the most attention of Mr. Bergheim's efforts, and we do not grudge it that distinction. The reclining figure of the Magdalen is nude; before her is an open book and by her side a skull. The face is full of expressive thought, and the whole composition, the lighting, and modelling irreproachably effective. Colonel Gale sends five charming views, of which we like very much the misty feeling pervading *Drear November* (No. 147). Simplicity of theme and masterly handling have ever characterised this gentleman's work. Mr. Ralph Robinson's many Norman views, wherein the figures of peasants are disposed with good effect, will possibly be eclipsed in interest by his consummately fine portrait of *Mr. G. F. Watts, R.A.* (No. 159), which deserves high praise. Oddly enough, immediately above this hangs a *Study of a Head* (No. 167) by Mr. Crooke, much resembling the one below it in style and attitude. We also like Mr. Robinson's *When the Heart is Young* (No. 163), a charming-looking girl playing a guitar-like instrument. He shows, among others, a big *Foggy Thames* (No. 166). It *is* foggy.

Mr. Henry E. Davis has taken small work under his protecting wing, and has produced some very pleasing effects. The sombreness of *The Dying Day* (No. 172) and *Dawn on the Fen* (No. 173), the latter simply consisting of a high light and a smudge, is more than counterbalanced by good artistic selection and the perfectly gradationed contrast and effect in the pretty group of figures *On the Quay* (No. 182) and the charming study of craft and river bank, *The Brimming River* (No. 183). *Nature's Mirror* (No. 184) is also a capital bit of work. *Twitch Burning* (No. 175), by Mr. H. M. Hastings, shows the smoke rolling up very naturally. Mr. W. Gill exhibits a view, *Moonlight Night* (No. 180), and it must have been a particularly bright moon by which this tolerably well-exposed picture was taken. Mr. W. Thomas has a capital study of the Westminster clock tower at *Sundown* (No. 177). Remarkably good definition characterises Dr. Aldridge's minute interior of *A Newlyn Studio* (No. 181), showing a lady artist before an easel; the lighting is also unexceptionally well managed. In addition to several woodland studies in the New Forest, Mr. F. H. Evans sends a *Portrait of Aubrey Beardsley* (No. 211), showing that eccentric artist to be quite a harmless, ordinary-looking young man.

Mr. Rowland Briant beats us; we give him best. Honestly, we try to make out what he is driving at, and it is not for the want of trying that we do not succeed. Elsewhere in the Exhibition he shows us that he can at least be intelligible even to persons of limited artistic sympathies like ourselves. Of *A Swamp* (No. 189), a patchy black impression, all we can say is, that it might just as well be called by a variety of names, and be equally convincing under any of them. *Willows* (No. 192) is a triumph of fuzziness; *per contra*, in *A Field Road* (No. 193), there is some approach to form and decision. As to *A Woodside Pool* (No. 214), a study in red, look at it which way we may, we cannot make head or tail of it. With two exceptions Mr. Davison's exhibits are equally puzzling to us. The exceptions are *The Salting* (No. 199), a grand study of sky and broken ground, and a view of *Wivenhoe* (No. 201), which has little or none of the murky dimness of many of its neighbouring efforts. Mr. Crooke's portrait of *Lord Rutherford Clarke* (No. 207) is got up to resemble an engraving: it is very fine in execution.

The suggestions and reflections of *A Wet Day in Paris* (No. 208) are shown in the view with wonderful accuracy by Mr. A. Stieglitz; it is a distinctly clever bit of photography. Mr. W. Thomas's *Night Study* (No. 213) is in a mysterious blue tone. Mr. B. G. Wilkinson shows a capital study of sheep and distance in *By Mead and Stream* (No. 216), vigorous and well defined; and of Mr. Sutcliffe's two exhibits there is much skill and humour in *His First Bath* (No. 221); nude boys coaxing a timid little lad into the water. Luridness is the attribute of Mr. Lyonel Clark's striking evening study of rough country, *In the Warm Blush of Evening* (No. 226). Mr. A. J. Golding shows a shore view, *Left by the Tide* (No. 233), which we fancy we have seen elsewhere, with the left and right reversed. Mr. Bernard Alfieri's portrait work is signally good. He shows five subjects: *Study of a Head* (No. 231), which is a half-length portrait of a young lady; *A Girl Smoking* (No. 236), recumbent young lady, with a cigarette; portrait (No. 237); and portrait of Miss V. Garrard, all of which take high rank in this class of work. *Sea Harvesters* (No. 234), a cart leaving the seashore; *December* (No. 235), cattle amid dismal surroundings, are fine examples of Mr. Alfieri's freedom and breadth of treatment of land and seascapes. Mr. Cadby's *Reflections* (No. 229) and *A Naiad* (No. 245) are exquisite figure studies. Of Mr. Shapoor N. Bhedwar's three exhibits, No. 242, *Her First Grief*, a little child kneeling at the feet of a lady, is probably the best.

It would require a very great deal of space to do justice to all the pictures shown at this Exhibition; we have, however, hit off, we believe, its salient characteristics. In addition to those of the exhibitors named, mention should be made of examples shown by Mr. Keighley, *Summer Sea*, an effective study of sea and rocks in blue carbon; A. Kapteyn; Carine Cadby (who turns photography to good use in decorative design); Charles Moss; G. H. James; Miss Farnsworth; Karl Greger, who shows several good works, notably *Evening near Dordrecht*, a fine bold effort; J. Caswall Smith (a pleasing portrait of a lady), Miss Clarkson; Messrs. W. Crofton Hemmons, J. C. S. Mummery, J. H. Avery; Miss Stoddart, Miss Janet Reid; Mr. Lewis Cohen, and others.

The Salon is, on the whole, a splendid exhibition, unfortunately marred by some of the maddest things that *fin-de-siècle* photographers have been allowed to inflict upon an inoffensive public. It is to remain open until November 4, and the more people who visit it the better in many ways, not the least important of which in our eyes being that thereby a wholesome distaste for blurry libels on art and nature is likely to be spread abroad. If the Salon archieves that much, why, then, "Long live the Salon," say we.

GLYCIN.

THERE are now so many developers at the photographer's disposal, and such satisfactory results are obtainable with those already in use, that it seems scarcely worth while to search further for new ones; but, after reading the high opinion of it expressed some time ago by so careful an experimentalist as my friend Mr. W. J. Stillman, I was induced to give glycin a trial.

Although I have not tried it with the extremely short exposures mentioned by Mr. Stillman, I have tested it carefully under circumstances where the exposure has certainly not been too long, as for instance for quick portraiture indoors, than which there can scarcely be a stronger test of the capabilities of a developer in searching out feeble detail and converting it to practical use. In this I have certainly found glycin decidedly inferior to metol, or to the mixture of metol and hydroquinone, but that may probably be due to the fact—or, at least, partly so—that I am more familiar with the latter developer. The conditions too are scarcely identical with those under which Mr. Stillman has made his tests, namely, exposures of a mere fraction of a second. Under such circumstances, it is possible the prolonged application of glycin may tend to bring out minute detail not reached by pyro, and to render it with sufficient strength to harmonise with the rest of the image, which in such cases is almost invariably thin except in the highest lights. But, for producing practical printing density in the obscurer details of the shadow side of an otherwise well-exposed portrait, I must certainly give metol the palm over glycin.

The entire absence of any tendency to "abnormal action," as it has been termed, or, in other words, to fog, is a strong point in favour of glycin, and, from its behaviour in negative work, it struck me as likely that it would prove useful as a developer for transparencies, for which purpose I accordingly tried it in competition with metol, hydroquinone, and amidol. Here I found its extreme cleanness of action of the greatest value; but, what is perhaps of more importance, it seems to give a wider range of tone—with ordinary gelatine plates, at least—than any of the other agents named, while with collodion emulsion its superiority in this direction is even greater.

The sample of glycin I used was of Dr. Andresen's manufacture, and for transparency purposes I made a stock solution according to the formula for "hard development" issued by the manufacturers, though why "hard" I am at a loss to know, for it is capable of producing the softest and most harmonious results. Used strictly according to that formula, diluted with three volumes of water, the results, so far as colour is concerned, are very similar to metol, softer and less heavy than either amidol or hydroquinone; in fact, a pleasing neutral black, with a tendency to grey. If used in a state of greater dilution than three to one, the colour in the high lights appears blacker, while the half-tones lean towards grey, an effect most probably resulting from the greater contrast given by the slowed development.

As regards the rapidity of action, glycin is certainly slower than either amidol or metol, though not so slow as hydroquinone employed alone. The difference is not, however, sufficiently marked to be worth consideration, and I think it may be said that, when used in this manner, there is not a great deal to be said either for or against glycin as compared with metol, but I should prefer it to either amidol or hydroquinone.

But it is in varying the formula, so as to utilise the power that glycin offers of altering the tone of the picture, that the advantage will be found. Many photographers, as well as many of the public generally, show a preference for cold or black tones in lantern slides and transparencies, as well as in paper prints, but there are still many who incline rather to the warmer shades, and these are more easily attainable with glycin than with any of the other developers I have tried with gelatine plates. I am leaving pyro out of the question, on account of its great tendency, even under the most favourable circumstances, to tint the gelatine; but it, perhaps, still remains pre-eminent as *the* developer for the production of variety of tone. With collodion films, where the tendency to discolouration does not exist, the objection to pyro disappears, but even here glycin runs it very close.

As the result of a considerable number of experiments which need not be gone into in detail, I find that, as with pyro and collodion emulsion, prolonged or slowed development, with a modified solution, tends to the production of warmer tones, though with glycin the element of length of exposure does not prove so important a factor. This gives glycin the advantage that, whereas with pyro and also hydroquinone the tones may be varied considerably by modifying the development, it is only by greatly increasing the length of exposure, with glycin it is the time of development only that need be increased. This is a by no means inconsiderable advantage when

lantern slides are made in the camera during the dull days of winter, as is the case with most amateurs.

The conditions which tend to induce the varied action of the developer consist in modifying the proportion of alkali and sulphite, and the use of restraining bromide. Its effect of altering the quantity of alkali is not so great as altering the sulphite or slowing the action of the solution, and therefore, to simplify matters, I prefer to leave the alkali intact, and to produce the result required by merely adding more or less sulphite and bromide to a standard solution of glycin.

The latter may consist of the same concentrated solution already given, though, owing to its syrupy nature, it is not so pleasant to use as a weaker one. The following stock solution may therefore be substituted:—

Glycin (Andresen)	48 grains.
Carbonate of potash	240 „
Sulphite of soda	240 „
Water	8 ounces.

For black or cool tones this may be used either full strength or diluted slightly with water, in order to get the particular shade of greyness that may be preferred. For the purpose of producing the warmer tones, I keep a separate solution, composed as follows:—

Sulphite of soda	1 ounce.
Bromide of potassium	120 grains.
Water	8 ounces.

This is mixed with the stock glycin solution, instead of water, in any proportions to ensure the desired result, from a few drops to equal parts, bearing in mind that the more sulphite is added the slower the development and the warmer the tone. The strength of the image, as distinguished from its colour, may be further modified by diluting the compound solution.

The tones obtainable in this way range through a variety of warm browns to sepia and purple, but I have failed with any certainty in getting the decidedly red colour on collodion films that are produced by pyro. The only advantage of the latter colours is that they may be subsequently toned with gold or platinum. W. B. Bolton.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Apparatus.—II.

Adams & Co. exhibit a collection of their choicest and most recently introduced apparatus. We have already, and only quite recently, given descriptions of most of these in this Journal. Many articles are enclosed in the glass case, rendering special examination impossible; but amongst the things accessible is the 1895 Ideal camera, fitted with their new finder. This finder, as we showed some weeks since, differs entirely in its optical construction from any others hitherto produced, for it is made with a series of convex lenses, and without any ground glass. The brightness of the image is phenomenal, hence direct sunlight falling upon it offers no obstruction to its employment without any shade. Similar finders, unattached to cameras, are also accessible for examination; so likewise is a nicely made changing box for containing twelve plates or twice that number of films. The new Vesta cameras, fitted respectively with changing boxes and dark slides, together with other Ideals, make up the exhibit.

J. F. Shew & Co.—The apparatus of these makers, being encased in a glass case, cannot be examined, but they consist of a considerable collection of well-made cameras of the Eclipse variety, one having a swing front, another being described as focal plane, the shutter contained in the camera. A third has aluminium fittings; a fourth is fitted with a tele-photographic lens; and a fifth is stereoscopic.

R. Field & Co. have been awarded a medal for a pair of lantern objectives fitted with polarisers and a pair of analysers.

A revolving stereoscope exhibited by J. R. Gotz has separable achromatic eyepieces, the separation being effected by a right and left-threaded screw. A similar means of separating the lenses of a binocular camera would prove highly useful.

Major Lysaght's exhibit is described as a hand camera having full-size finder, special adjustment of iris diaphragm, a shutter with speed-indicator and safety catch.

A model of a magazine lantern-slide changer is contributed by Birt Acres. This cannot be readily described without a drawing.

Holmes & Watson show Matthews' patent portable lantern, and the "Ideal" lantern is exhibited by Archer & Sons. A curtain round the back of this lantern, to prevent the light from streaming out in the faces of those behind, forms a useful feature in its construction.

DENSITY OF IMAGE AND PERMANENCE IN POSITIVES.

A fortnight ago I wrote an article drawing attention to the fact that a sheet of albumenised paper which had taken up twenty-eight grains of silver nitrate from the sensitising bath, after being darkened by the action of light, and fixed and washed, contained only about half a grain of metallic silver, which amount could be obtained from a little over three quarters of a grain of the silver nitrate used; and I raised the question, Why do we have to use these twenty-seven extra grains of the nitrate, which take no part in the composition of the photographic image, after the print has been through the hypo bath and washing water? and I further asked whether we have ever realised the importance of the organic matter, especially in regard to permanence, which, analysis shows, forms a part in the composition of the images?

For years I have been pegging away to try to induce the parent Society or others to take up problems of this kind, and I am pleased to know that ideas which, ten or twelve years ago, I was often laughed at for holding, by men who did not stay to give themselves time to think, are now accepted and mentioned as facts by those very men. And there is another point about it, and that is, that I mean to keep pegging away, to the best of my ability, until I can feel that some of these mysterious problems are thoroughly tackled.

Unfortunately, I shall have to call attention to several misstatements, &c., in last week's leader, but I will do so as briefly as possible.

I pointed out that density does not depend upon the amount of silver in a developed image, and said that the same law holds good in a printed-out image. You say that in the latter case it is not so, either in theory or practice. I can only say this, that any one who has ever had any experience whatever in chloride-emulsion making will bear me out that the question of density and colour of deposit depends almost entirely upon the method of forming the emulsion, and upon the organic matter with which the silver enters into combination previous to the exposure to light. Why, the very sizing of the paper plays a most important part in the density and colour of the image, due to the difference in the composition of the deposit produced by the action of light, and not to the actual amount of reduced silver in that deposit.

You then go on to say that I have based my arguments upon an "utter fallacy," viz., that a developed and printed-out image are the same in character. Every one knows that a collodio-iodide image contains more metallic silver in proportion to the density of deposit than a printed-out chloride one, and in that way they are not identical; but when one comes to the development of bromide and chloride deposits, especially when by long exposure a warm tone is obtained, analysis and destructive tests show that the composition of the image more nearly resembles, and in some cases is almost identical with, that obtained by printing-out, and I am at a loss to understand why it should be an utter fallacy. If, in a dry state, silver chloride in the presence of albumen or gelatine is reduced by light to a *positive chemical union between the reduced silver compound and the organic supporting basis*, I see no reason why the same union should not take place during the reduction of the same silver compound by development, and it is in this direction, I feel sure, that we must look for an explanation why density and quality are obtained on plates sold at the present time, containing such a minute quantity of the silver haloids in their films.

We now come to a most extraordinary and thoughtless statement, viz., "that organic matter is the developer that brings about the reduction of the silver salts under the action of light." If this were so, *the image would consist of those reduced silver compounds*, after the print had been through the hypo bath; but, if $\frac{35}{36}$ of the silver necessary for the formation of the image is removed in the fixing and washing waters, it must rather be that the silver is the developer that brings about and causes this reduction of the organic matter.

As to an albumen film requiring free silver nitrate to obtain vigour, a fact we are told "that the veriest tyro and merest schoolboy knows," seeing that I mentioned that it was present in the film, that I used an excess of forty grains of silver nitrate per ounce in

the preparation of the emulsion for the very purpose of obtaining vigour, and that I coagulated the albumen on the glass by heat after coating, is sufficient one would think to show that I was aware of the fact. Beyond remarking that I would be very pleased to see you prepare a chloro-albumen emulsion without coagulation or deposit by half a dozen different ways at some photographic society's meeting, I can leave that portion of the article.

We are told that you are "quite unable to follow me in my figures as to the quantities of silver required to sensitise and contained in a sheet of paper." *That is quite evident. Also,* that you have no recollection whatever of what Professor Hardwich wrote about the amount of silver in a sheet of paper, &c. That gentleman mentioned it in several of his writings. I have looked up one of them, from which I give the following extract:—

"In the darkening of photographic papers the action of the light is quite superficial, and although the black colour may be intense, yet the amount of reduced silver which forms it is so small that it cannot be conveniently estimated by chemical reagents. This is well shown by the results of an analysis performed by the author, in which the total weight of silver obtained from a blackened sheet, measuring nearly twenty-four by eighteen inches, *amounted to less than half a grain.*"

Space will not allow me to take up several other points that I would have liked to have done, but there is one to which I must refer. We are told that when "Mr. W. Bishop appealed to our columns for some authoritative decision on the combined toning and fixing bath, Mr. Starnes was good enough to give us his views." The facts of the case were: Mr. Bishop referred to a statement of mine as to lead toning, and I simply wrote a letter giving the experiments upon which my statement was based to show that it was not made without some grounds.

HERBERT S. STARNES.

THE PROJECTION MICROSCOPE.

AT the Central Photographic Club, on the 28th ult., Mr. R. Mason (Clapham) gave a demonstration of the use of his apparatus for the projection of microscopic objects on the lantern screen. "The microscope had been described as a selfish instrument, inasmuch as objects could only be viewed by one person at the time. The facility of projecting or throwing the image on to a suitable screen has been the desire of lecturers and scientific amateurs for a very long time past. The first instrument devised for the purpose was the solar microscope. The source of light, as its name suggests, was the sun; but, owing to the very scarce appearance, or perhaps the uncertainty of its being in working order, and thus making it very difficult to announce an exhibition, it has gone out of date, and the majority of those instruments are laid by and forgotten, but occasionally one turns up at "the three golden balls," where I saw the last one. After this the projection of objects by means of the microscope was forgotten until about 1830 to 1840, when the limelight—or the Drummond light, as it was at first called—was invented. For a long time there was no attempt to apply it for this purpose. As you doubtless know, the limelight when first used by mixing the gases in one bag was extremely dangerous. That, no doubt, was the reason it was not applied to the lantern for some time; in fact, until the gases were separated by means of two bags, only mixing at the jet near the point of ignition. Meanwhile a few microscopes, called "demonstrating microscopes," were constructed so that they could be handed round a class of students for individual examination of the object. Some of these had a small lamp attached, others were made to point at the light, but these plans were difficult to carry out. Some persons took a long while to understand the working of them.

When the limelight was successfully applied to the optical—or, as it was called then by its old name—magic lantern, a form of microscope was devised, and very fair results were obtained with it with powers of 2½ ins. to 1 in., but the powers being, like the solar microscope, generally single lenses or two plano-convex lenses with their convex surfaces placed towards each other, it was impossible to get the results to be obtained from a properly corrected achromatic combination of lenses.

About the year 1882 there was a revival of the idea of a new form of projection microscope in this country, but the German schools interested themselves in the matter before that time. It is, of course, possible to project a very small picture with any ordinary microscope that has an inclining joint, but the amount of light is so small it is not worth calling a projection.

Lantern or projection microscopes have to be worked under very much more difficult circumstances than the ordinary table form. In the first place very much more magnification is required, and consequently any faults in the objective are magnified in proportion. There seems to be somewhat of a mystery about the performances of different lenses on the screen; some of our very best makers, whose lenses are the finest that can be produced for table work, fail when used on the screen. Again, some cheap French and German lenses seem to perform well in that way.

There is the difficulty of getting sufficient light, and this want of light renders it very difficult to show images when there is not sufficient contrast in their structure. Take, for instance, a diatom. Being composed of flint and transparent, it is almost an impossibility to show one with the most powerful mixed jet we have. When a photographer requires a sharper image, he puts in a smaller stop and so cuts out the defective parts of the lens. At the same time, to make up the loss of light, he is able to give a longer exposure, and thus make up for what he takes away. With the microscope it is different; what you see on the screen at first is all there is to be seen; the eye gets accustomed to the darkness of the room after a time, and images seem to be brighter; but there is only the same amount of light as at first.

The great difficulty to contend against is getting a large image and yet sufficient light. With the higher powers—say, ¼ inch, ⅛ inch, and $\frac{1}{17}$ inch—recourse must be had to a good arc light; but, as the electric light is only within reach of the favoured few, I don't think that at present it is worth while to trouble about it. A certain coarseness of detail in the projected image is an advantage when viewed from a distance; in fact, all projected pictures, I think, look best at a little distance off; it seems to lend enchantment to the view, be it a landscape or a microscopic specimen. The utmost the oxyhydrogen light, as far as I have seen, to give a satisfactory picture is with a $\frac{4}{10}$-inch objective, with an amplifier. With that we get about 1500 diameters, which, on the table form of microscope, is very high magnification indeed, and is obtained with a $\frac{1}{10}$-inch objective and a D eyepiece.

The $\frac{4}{10}$-inch objective gives results sufficiently brilliant to exhibit before a number of persons in a large room. In a small class-room higher powers may be used, as under the latter circumstances a small disc is easily seen, but should high powers be required recourse must be had to the arc light, where it can be obtained. It opens up a large range of possibilities, and is said to give a brilliancy and sharpness to a picture that is not obtainable with the limelight."

The demonstrator then exhibited a slide giving a diagram of the older form of projection microscope. The solar microscope was very similar.

The second diagram showed the general form of all modern projection microscopes.

Mr. Mason then described his improved form and the method of using it for projection as a table microscope and for photography.

Its capabilities for projection were shown by the exhibition of a large number of microscopic slides, including sections of wood, scales of butterflies and moths, whole insects and parts of same, and some living objects, photo-micrographs of Podura scales, *pleuos igma angulatum*, and other diatoms were shown as results obtained by use of the apparatus with a $\frac{1}{12}$-inch objective.

PROFESSIONAL PHOTOGRAPHERS AND DEPRESSION OF BUSINESS: AMATEURS.

III.

I AM addressing myself to professional photographers; but in what follows some things may be found useful to amateurs also. In the former papers it was chiefly my endeavour to point out and to illustrate the absolute necessity for those who wish not to have to complain of depression in business to set to work resolutely to place themselves among the *fittest* of whatever rank they, in the profession, may occupy, and so, by degrees, to raise themselves even to higher ranks. I come now more directly to the question, How is this to be done? I am aware that very many either know well already, or will not fail to discover and to use the means as they go along. There may, however, be some to whom a few hints, from the point of view which presents itself to me, may be useful. I will rather address myself to some one of those occupying one of the lower ranks in the profession which he has recently entered on his own account with somewhat limited means—that is, one who may seem to be at a disadvantage in his endeavour to become one of the *fittest.*

From what I have experienced myself of the time required by the different photographic operations when they are carried out thoroughly, I can easily conceive that such a one, with little help available, if he gets the work to do, may have to apply himself for long hours in order to get all done and to make both ends meet. Such may seem, at first sight, rather a hopeless case, but I think I can show that, if it be allied to intelligence and resolution, it need by no means be so. It will however, demand patience and perseverance. Speaking to such a one, I would say: Adopt in the first place, the principle of avoiding ever to send out bad, or even, if possible, inferior work. You may gain a few shillings by the execution of one order; but the work will go among all the friends of those who have given the order to advertise you as a worthless photographer, whatever your show-case

may say to the contrary. If, on the other hand, owing to accident or other causes, so much extra trouble may have to be taken, on some particular occasion, as to reduce the profit on that particular transaction to a mere trifle, or to nothing at all, still your good work goes amongst the friends of your client, the more satisfactory the more widely, and your have thus, instead of putting the money in your pocket, invested it in an advertisement of the most valuable kind.

I would push the principle still further, and would say: In all you do be not so much guided by the consideration of mere money price to be paid, or money profit to be immediately gained, as by the quality of results to be obtained and consequent reputation to be gained. The little extra money you have to pay out, or the profit that does not immediately come in, will be so much money well invested, which will, in due time, bring large interest, increasing your business, and at the same time rendering a higher scale of profit possible. What, for instance, is the value of the difference in price of each dozen plates of two different makes when shared by the several plates, provided that with the greater number of them you can secure a better result, and, perhaps, save yourself a good deal of trouble into the bargain?

I come now to another all-important and wide-reaching principle, which has reference to your actual manipulations. I will call it, unless it has claim already to a better name, the *principle of comparison.* It may be called also the *experimental principle;* but I prefer the former, as showing the *method* by which the experiment is made. It is a very old method in the hands of those carrying on all kinds of investigations, either with the object of discovering some new truth or of verifying the principle on which some known truth is based. It consists, as I intend it, in working with factors as far as possible known, except in one particular case about which you wish to learn. Here, for the sake of the experiment or the comparison, you introduce purposely two or more alternatives, and observe which give you the result most nearly desired. When you have settled this point, it may be used in its turn as one of the fixed factors to aid you in fixing, or verifying, others, and thus you become able, with more and more certainty, to use the means that will produce the results you most desire. I put forward the principle or the method in answer to the question which you may ask, How can I, with my time so completely occupied in what is almost exclusively mere mechanical manipulation, do anything towards introducing higher qualities into my work? My answer is: If you simply go through the routine of these manipulations with the same precision that a good machine might do, the results you will produce at the end of the year will be as nearly as possible what they were at the beginning, and I fear there are not a few machines in human form quite content to go on their light-hearted way in this manner one year after another. *Tant pis pour eux* if, through the influence of amateurs, the better work turned out by other men, or from any other causes, their customers become more fastidious. You may, on the contrary, even under the seemingly unfavourable conditions mentioned, so go through your work—and it is your own fault if you do not do so, for you were not made to be a mere machine—in such a manner that each month finds you a step in advance of what you were the previous month, and, then, there are twelve months in the year.

Now to begin work. You have provided yourself with a studio and are provided with camera and objective. You must provide yourself with plates and developer. If you examine the advertisement of almost any one of the foremost plate-makers, you will find that those plates are the *best that can be obtained.* For my part, I doubt if there is any absolutely *best plate;* but for a particular individual, working in a certain way, with particular objects in view, there may be a plate giving, in his hands, results superior to those of any other make—that may be the best plate for him, if he can find it. About that question, however, you need not trouble yourself at the beginning. There are sufficient numbers of very excellent plates. You, perhaps, already prefer, or are accustomed to work with, a particular kind of plate in conjunction with a particular normal developer; if not, select for such one of the more generally approved. Begin, in working with them, to apply the comparative method I am recommending, and do not shift to any others until you have ascertained in all points what you can do with them. You then have a solid base of operations to start from, and can proceed to widen your domain in any direction that may seem to promise the most advantage. Generally, a preliminary reconnaissance by the comparative method will guide you as you proceed further.

Let us see what you have already fixed to start with. In the first place, your objective, with its series of stops arranged probably, as is generally the case, so that the second largest demands for the plate double the exposure that the first does; the third, double that of the second, and so on. Thus, if the first admits an exposure of five seconds, the second will require 5×2, the third, $5\times2\times2$, and so on. These are factors quite fixed, and do not vary. The normal developer, at an ordinary temperature, you may also regard as a fixed factor. Taking also the brightest light which you are likely to use in your studio, you may call this, and treat it, as a fixed factor. Your studio will have been arranged to receive the light in certain directions from the sky. You will have the means of giving a certain direction to that which is to fall upon the objects to be photographed, and of modifying its quality and amount. Now, the actinic intensity, or its action on the plate, will vary with the season of the year, the hour of the day, and the state of the atmosphere, whether very bright, very dull, fairly bright, rather dull, and also with the different modifications arranged by the studio. This action of the light is probably the element, or the factor, about which, for some time, you may have most difficulty; but, if you go about the thing in a systematic manner, this difficulty will gradually disappear. For one of these elements—the variation in the brightness of the atmosphere—you must depend on your own individual appreciation. If you adopt something like the four gradations I have given, you will get into the habit of judging these so as seldom to involve any appreciable error. If you adopt in your studio certain definite arrangements of blinds, you will be able presently to fix the effect of these by experiment. The variations dependent on the season of the year and the hour of the day are often set forth in tables, which make this a sufficiently fixed element. Taking these different points into consideration, I advise you to make for yourself provisionally a series of *light factors.* Thus at midday, in the middle of June, with bright atmosphere and your curtains arranged to admit the largest amount of light, you will write down the factor 1. Now, try and form an idea of how much the exposure would have to be increased for different variations from this normal lighting, so as to form a series, expressed by factors such as 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, 5, 6, 7, 8, 10, 12, 15, &c., neglecting differences that may be only slight. Your studio should not admit any direct sunlight, as this might render the contrasts too strong, besides being subject to much larger variation through the day and the year.

Accepting the above factors only provisionally, the most important point is now to fix, as definitely as possible, the rapidity of the plate, and to exclude, as far as possible, all chance of error, the trial should be made in the light, marked 1; or, if it must be made at some other season—in March, for instance—let it be made near mid-day, and in the brightest light. The speeds of plates you will best indicate by numbers, 10, 12, 15, &c., expressing the rapidity as compared with that of an imaginary plate, which, with largest stop, brightest light, and normal developer, would take one second; then the above speeds would require, under like conditions, $\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{15}$ respectively of a second. I think photographers generally expose two plates, with change of position, on a sitter, in order to ensure, if possible, one good negative, or to give the client a choice, if both are good, which, after a little experience, they ought nearly always to be. This system will answer very well for our comparative method. There is often given with plates some indication of speed, which you must endeavour to adapt to your own system of factors. Suppose you have reason to think it may be about 12, and that you find, for definition, you must use the third stop. Take numbers a little way on each side of 12—say, 10 and 15—and use these as speed numbers for the two plates exposed in succession. We shall have speed fraction × stop factor × light factor = number of seconds required for exposure.

Let us call the plates (*a*) and (*b*) respectively. If it be near mid-day at midsummer, as advised above, we have, for (*a*), $\frac{1}{10}\times2\times2\times1=\frac{4}{10}=\frac{2}{5}$ second; for (*b*), $\frac{1}{15}\times2\times2\times1=\frac{4}{15}=\frac{1}{4}$ second. If it were in the middle of March or September, under the same conditions, the table consulted might give, for mid-day, light factor $1\frac{1}{2}$, instead of 1. We then have, for (*a*), $\frac{1}{10}\times2\times2\times1\frac{1}{2}=\frac{12}{20}=\frac{3}{5}$ second; for (*b*), $\frac{1}{15}\times2\times2\times1\frac{1}{2}=\frac{12}{30}=\frac{2}{5}$ second for the length of exposure required.

Now proceed to develop, beginning with exactly the same normal developer for each plate. After the development has commenced, you may, of course, modify the developer according to the needs of each plate in reference to exposure, so as to make the best of each. You will judge of the correctness of the exposure by the first application of the developer. You may find that one has been under, and the other over-exposed, and thence be able to judge how near 12 is to the right speed number; both may have been under, or both over-exposed, and you will judge how near 10 or 15 may be to the right number; so that, for the next two plates, you will be able to adopt speed numbers much more nearly correct, and, after two or three trials, to fix the speed exactly. Suppose it to be 8; you will now be able to proceed to fix more exactly the different values of the light, an operation longer, and more difficult, but a very essential one.

It will be better to deal first with that part which depends more on your own appreciation. Supposing you have thought that the relative times of exposure for bright, rather bright, rather dull, dull, might be represented by the factors 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$; supposing, further, that your two plates are to be exposed in March, or in September, about 8 a.m. or 4 p.m. (we have already supposed above that the hour and season table for mid-day bright light gives $1\frac{1}{2}$). Suppose it to give, for 4 p.m., 3. Suppose, again, for definition, you use stop 3, and, further, that you have judged the light to be rather dull. We want to ascertain whether the factor 2, set down for "rather dull" above, is correct, and to find the correct one if it is not. Let us take for trial one a little below and one a little above 2, as $1\frac{3}{5}$, $2\frac{2}{5}$ respectively for the two plates (*a*) and (*b*); we shall have, speed factor × stop factor × hour and season factor × light factor; that is:—

For (*a*), $\frac{1}{8} \times 2 \times 2 \times 3 \times 1\frac{3}{5} = \frac{2 \times 2 \times 3 \times 8}{8 \times 5} = 1\frac{2}{5} = 2\frac{1}{2}$ seconds nearly;

For (*b*), $\frac{1}{8} \times 2 \times 2 \times 3 \times 2\frac{2}{5} = \frac{2 \times 2 \times 3 \times 12}{8 \times 5} = 1\frac{8}{5} = 3\frac{1}{2}$ seconds nearly,

for the times of exposure. Now, setting to work exactly as when we were fixing the speed number for the plates, beginning with normal developer for each, and judging exposure for each, it will be seen which of the light factors, $1\frac{3}{5}$, 2, or $2\frac{2}{5}$ is most nearly correct. A few similar trials will enable you to fix this factor, and in the same way for the rest, bright, rather bright, &c. It now remains only to fix, by similar comparative trials, values for the principal modifications, made by arranging the curtains, &c., of the studio. You may call this the *studio factor*. Now, if, as I have supposed, you have already put your hand on one of the published hour and season factor tables, you will have fixed, approximately, all that it is most necessary to know for correct exposures in your studio; for I suppose all through you have been carefully noting down the results of your trials. Thus you will have arrived at a fairly fixed method of working, and can make any further little corrections needed as you go along. Every operation you perform should be so arranged as to enable you to fix something more exactly, or to confirm something already fixed.

While all this has been going on, I suppose you have been printing on some selected kind of paper with settled methods of toning, fixing, &c. That will have enabled you to learn how far the printing is to be carried, in what kind of light with the different negatives, and to appreciate the values, for your purpose, of the different qualities found in the negatives you have already produced, thus enabling you to see what *kind of negative* you must aim at producing.

You have now a pretty secure base of operations from which you may proceed, by the method I have illustrated, to further conquests. You must use your judgment in selecting the direction in which it may be best first to operate. You may, for instance, seek to improve the *artistic* effect, and one of the means at your disposal lies in the posing and lighting. In exposing the two plates you may make two different arrangements for the lighting, either with the same pose or two different ones, taking care to make the proper calculations for time for each according to the factors you have already fixed. When you have determined what you wish in this direction, you may turn your attention to some other point; perhaps to the developer and the improvements obtainable by means of it. You may, without further alteration, carry the development of one plate further than that of the other until you have determined at what point it is generally best to stop the development. Then, using the same developer, you may vary its composition and see what improvement can be obtained by that means. Afterwards, still using the same plates and exposing each pair under the same conditions, you may compare other developers with the one you have been using; developing one plate with the old, and one with the new. By this means you will gradually arrive at the developer you prefer to use and the manner of using it. With this developer you will now continue to work. You may desire to carry your next operation among the plates.

Procure a new brand to compare with that already in use. Fix the speed number for that in the same manner as you had done for the other. Expose, under the same conditions, every time one of each brand, only calculating the time of exposure for each by its own speed fraction. You will soon arrive at a conclusion as to how far, for your work, one of these plates is superior to the other. There is, however, one precaution to be used before fixing finally on either. I am supposing you to have used for both plates the developer which you had found best for your own plates—brand A let us call them. For the new brand, B, the maker may have given a special formula for development, and this may give with B better results than yours. This must be put to the test. Expose two plates of brand B under the same conditions, and develop with the separate developers. Make a few trials in this way. Now expose one of each brand under like conditions, and develop each with its own developer. You will soon arrive at a safe conclusion, and make your choice accordingly. You may continue by the same methods to carry your operations as far as may seem desirable among the plates. If you have varieties of work to suit these, you may prefer at length to work with more than one kind of plate and developer.

While you have been arriving at the best arrangements for the production of your negatives, you may by similar methods have been testing different brands of paper for tinting, different toning solutions, &c. By all these you will at length arrive at such settled methods of working as experience has shown you to be the best, or very nearly so, for the results you wish to produce. You should, of course, use any opportunities within your reach for comparing your results with those produced elsewhere, not for the purpose of any slavish imitation, but in order to form in your own mind an ideal standard, towards which you must be continually reaching forward. If parallel with all these endeavours you have been *organizing* your work and your business, so as to get through it in the most precise and certain manner with as little waste of time as possible, you ought now to be prepared to deal with a considerable extension of business, if that should come to you. I have, however, still a few words to say to you on one or two points which I consider to be in the mean time even more important for you than an extension of business, and which, with or without that extension, you should endeavour by all means to attend to.

I have supposed that hitherto all your own time has been absorbed by the necessary operations connected with the routine of work and business, and I have shown you how even under these conditions you can so carry them out as to be marching continually towards the goal which you constantly keep before you—namely, that of placing yourself among the *fittest* of your own rank, and then, if found desirable, of rising to a higher rank, and of doing this without giving any time outside actual business requirements. I advise you no longer to rest satisfied with this, but to arrange for yourself some time outside these requirements. Without an extension of business, the superior ease and certainty with which you now work will enable you to do this. With an extension of business you will be able to do so through the help which you will now be in a position to obtain and to supervise. Get the time by all means. For what purpose? To enable you to make yourself further acquainted with the theory of photography, and the principles on which the different operations are founded; that will be a means both of securing greater *technical* perfection, and of rising from the mere *mechanical* to the *artistic*.

It is not difficult nowadays to make a limited selection of books in which is set forth, with more or less clearness and precision, all that it is most necessary to know. These should be studied and carefully thought over, and the different points compared with the experience you have already gone through, noticing how far, directly or indirectly, the information and explanations given answer any questions which that experience had raised in your mind. I am supposing you have worked so thoughtfully that such questions will necessarily have arisen in your mind. Such study and reflection will prepare you to make the best use of another means easily available, and which I think capable of being made a true *school of photography* for you. I refer to THE BRITISH JOURNAL OF PHOTOGRAPHY and the ALMANAC published every year in connexion with it. Procure the different numbers of these as they appear, unless you have a preference for some other periodical and annual equal or superior to them, and use them as I have advised you to use the books. I may mention that when I first began myself to take great interest in photography, and to practise it in my spare time, for the general principles and routine, I soon procured the best of what was then to be had in French and in German, as well as in English, and I carefully studied these on all the points which most interested me. By the side of these I found the JOURNAL and the ALMANAC, as I took them in during four or five years, very valuable; sometimes from the direct information given, but very often also from the manner in which they set me thinking. From suggestions in these periodicals and in my books, in connexion with what I was wishing to realise, I thought out many things which had not yet appeared in any publication, and I should have experimented with them and verified a larger number, could I have given more time. In turning my attention again more recently to the subject, I see that many of these things have since been fully set forth, and have now become the common property of all.

These last considerations lead me to say that, when you have

succeeded in regularly making such a use of photographic literature as I have recommended, I would advise you to strive to arrive, if possible, one step further. It is evident to all who read the JOURNAL and the ALMANAC that numbers at the present day have arrived at such a point, not merely the few who formerly, from means and leisure were able, as amateurs, to make themselves principally the pioneers, but also many very busy professional photographers. These are the kind of men who have been doing most to build up the art and the science—there can be no doubt that photography must be a combination of both—and to provide a new source of pleasure, or of profit, for all. These have arrived at a position which I consider enviable. As I have repeated, I am only an outsider, and do not pretend to have a personal knowledge of many of the facts. I can only *draw conclusions* from what I read and from what may have come under my own very limited observation. If, however, I could know the history of those men whose present position I have just referred to as enviable, I think I should find that, in not a few cases, they began much as I have supposed you to do. What do I find, now, in these men worthy of your own imitation? Why, this, that of the many questions that arise in their minds, either in their own thoughtful practice, or from their thoughtful reading, they set themselves by direct experiment to resolve as many as the time at their disposal will allow, selecting them either with reference to their importance, their usefulness to themselves, or to their own knowledge and the means at their command. No doubt, the results of these experiments are often kept for a time for the individual use of the person himself; very often also they are freely given forth, and workers at large are enabled to profit by them.

In many instances, no direct money profit can accrue to those who thus work and give the results for the benefit of others; yet I should be far from saying that such a course must be unprofitable to themselves. As I said, I advise you, if you can possibly arrive at that point, to give a little time, without thinking of the immediate money profit, to resolve, by the comparative method which I have previously explained, such questions as arise for you in your own practice. I do not advise every one immediately to rush into print. If you succeed in solving your difficulty, you can keep the result for your own use, and endeavour to turn it to profitable account. Where you cannot succeed yourself, by taking in the JOURNAL you have a farther fund of knowledge and experience on which you can largely draw, even that of the obliging Editor himself. Put your difficulty in a clear and concise manner before him, and I shall be surprised if, in a week or two, you do not find, in all cases proper and possible, answers in the proper column just as clear and concise; and now, with a few additional remarks, I must really draw what I had to say to a conclusion, not that I feel the subject to be by any means exhausted, but because I have already been led to give much more time and to go much beyond the limits I had supposed necessary when I began.

W. WASHAM.

(To be concluded.)

BACKGROUNDS.

THE amateur is no way more handicapped when he turns his attention to portraiture, which, next perhaps to *genre* subjects, is the highest phase of pictorial photography, than in the matter of suitable backgrounds, and this is the more regrettable as, without such, says Mr. John Clarke, the highest degree, or even a high degree, of success is impossible.

Natural backgrounds of trees, foliage, &c., are sometimes both beautiful and suitable, but they are rarely so situated that the lighting can be under control, and, however important the background may be, it must always be less so than suitable lighting. Where the grounds are large and the material varied, good results may be got by cutting off the top and one side light by a large enough sheet of canvas and the employment of hand screens. Rejlander, who may be called one of the fathers of artistic photography, on one of his visits to Edinburgh, made in the Royal Terrace gardens some of the most beautiful pictures I ever saw. His studio, which he moved about from place to place, as suited his fancy, consisted of two pairs of blankets, stitched together end to end, forming a sheet of about fifteen by seven feet. One end was tacked to a ridge pole about ten feet from the ground, and it descended like the roof of a tent to another pole two feet lower and five feet to the right or left, and from that to the ground. The hand screens were simply barrel hoops covered, some with white and some with brown paper, to which handles like broom-sticks were fixed. With such primitive appliances he seemed to have the lighting under perfect control, and produced pictures, as I have already said, equal if not superior to anything of the kind ever seen on the walls of an exhibition.

But we are not all Rejlanders, nor have all easy access to suitable *al fresco* material, but probably most of us have at command an ordinary verandah facing either north or east, and he who cannot so arrange it as to get almost any desired style of lighting had better leave portraiture alone. Suppose the verandah faces the north, the east end will, of course, be the place for the background, and should it happen to be, as mine is, the wall of a projection of the building, a simple hanging background weighted by a roller will answer the purpose admirably, and has the advantage of being easily rolled up and put away when not in use. Where, however, the east end is open, the background should be stretched on a frame, which should be as large as is consistent with getting it under cover when not in use.

Those who do not need to count the cost may, with advantage, find just what they want at most of the stock houses, either on roller and lath or as a cloth ready to tack on to the frame; but those of limited means and a little ingenuity will find no difficulty in making their own backgrounds. Stout cotton sheeting, which may be got of any width up to nine feet, answers admirably. If it is to be on roller and lath, it may, during the various operations, be tacked tight on the verandah or other floor; but, if it is to be on a frame, it should, from the beginning, be fixed on to it. There is a right way and a wrong way of doing this, and, as is not unusual, the latter is more frequently taken than the former.

The amateur background maker should first tack the cloth to the middle or centre of each of the four sides of the frame, and from these work on to the four corners, drawing it as tight as possible. The most suitable colours are ordinary whiting, lamp-black, and Venetian red, and a sufficient quantity of ordinary size. By way of priming, the cloth should have well rubbed in a coat of simple whiting and size, and I have found nothing better for applying it than an ordinary shoe-brush, first going over the surface with a circular motion, and then in straight lines, crossing and re-crossing, until the texture is completely filled.

When this is quite dry, a second coat of the same material, to which sufficient lamp-black and a trace of Venetian red has been added to make a greyish tone, more or less dark according to taste, should be applied, and in this way a plain background, in portraiture, especially amateur portraiture, the most generally useful, is easily produced.

But for some purposes a shaded background is desirable, and it is easily within the compass of the ordinary amateur. The opposite side of the framed cloth may be employed, and, where it is so, the priming should be applied to both sides at the same time. For shading, a small quantity of the greyish size colour employed in painting the plain ground should be set aside, and have added to it sufficient lamp-black and Venetian red, in about the proportions already employed, to make it as dark as the desired darkest shade. This should be tested by applying a little to a white surface and letting it dry, as it is much lighter then than while wet.

Operations are begun by applying the greyish size colour, beginning at the top and coming down about one-third. To the colour is added a little, just how much is a matter for taste and judgment, of the dark mixture to the whole of the colour in the pot, and the coating brought down to about the middle, carefully blending the junction between the lighter and darker colours, so as to show no junction at all. A little more of the colour is added, step by step, as the descent is made, say, in half a dozen steps, with the same careful blending between each step.

In this way the shading is easily made from lightish grey to any desired shade of dark, and a background produced that is really practically three, as it may be used with the light at the top or at either side with varied and satisfactory effects.

THE FUNCTION OF SODIUM SULPHITE IN DEVELOPERS.

[American Amateur Photographer.]

BEFORE the discovery of the value of sodium sulphite as an addition to the pyro developer it was necessary to prepare a fresh solution for the development of each plate. This caused much annoyance and took up time. The introduction of the neutral sodium sulphite in the proportion of four grains to one of pyro made quite a revolution in the procedure of development, enabling one to develop four or more plates in succession before the solution grew dark or muddy. By adding an acid—say a few grains of oxalic acid to the pyro sulphite solution—it was found to preserve it clear for a long time, preventing oxidation, so that it was always ready for use. Others recommended the use of sulphurous acid, inasmuch as it prevented the sulphite from changing to a sulphate, and was not regarded as so much of a retarder as some other acids. To those who still prefer the pyro developer these acids in combination with the sodium sulphite are largely used.

When the introduction of the eikonogen developer occurred, neutral sodium sulphite was one of the principal components to be used with it. No preservative acid was advised, it was simply the mixture of three parts of sulphite to one part of eikonogen in thirty volumes of water. With such a developer there was enough alkali present from the carbonate of soda evolved from the sulphite to develop a fully exposed plate, gradually but slowly. If a plain solution of eikonogen and water is prepared and flowed over a plate, no developable action takes place, but the developer soon becomes dark, and is useless. Now add sodium sulphite to a similar solution, and we see not only its preservative action in keeping the solution clear, but also a developable action in bringing out an image. This developable action, of course, is greatly increased by the addition of an alkali, such as carbonate of potash or carbonate of soda, and it is the special function of the sulphite when they are added to prevent the quick oxidation of eikonogen, or of any similar agent. Even in a stoppered bottle three-quarters full, I have noticed that a sulphite-eikonogen solution turns from a yellow-straw colour to black in about three months. Possibly, if sulphurous acid had been added, it would have kept longer.

Several years ago Captain Abney demonstrated that a concentrated solution of sodium sulphite dissolved out slowly the unreduced bromide of silver in a plate the same as the fixing qualities of hyposulphite of soda. Believing its action would be too slow to affect a plate in this way during development, I tried the experiment of developing a lantern-slide plate with a saturated solution of sulphite, pyro, and carbonate of soda. When the image was half out, in the course of three minutes, the film near the edge of the plate began to clear, and, by the time development was completed, three-fourths of the plate was clear glass, and the slide was spoiled. It clearly proved Captain Abney's demonstration, and showed that the delicate film of a slide plate is readily attacked by an excess of sulphite.

Regardless of these experiments, there has been lately announced the formula of Mr. Moreno, who proceeds on the basis of three concentrated solutions. He first mixes a saturated solution of sodium sulphite, uses part of it to hold in solution pyrogallic acid, and has a third saturated solution of carbonate of soda. The developer is made up by adding the right proportion of the pyro-sulphite solution to the saturated sulphite, and to that the carbonate of soda saturated solution about one-third the volume. When completed, we have for a developer approximately a saturated solution of sodium sulphite.

Yet, when properly timed plates are put into it, they develop up evenly and keep perfectly clear, apparently with no loss of the film by the fixing action of the sulphite that one would expect to take place. This may be accounted for by the fact that plates for negatives are coated with a much heavier film of emulsion and silver bromide than in the case of lantern-slide plates, which would require a much longer time for the fixing action of the sulphite to have any effect. Then, again, the large percentage of pyro in the developer combined with carbonate of soda probably hastens the developing action very much more in advance of the fixing action of the sodium sulphite. In this developer the preservative quality of a strong solution of sodium sulphite is very noticeable, inasmuch as Mr. Moreno uses the developer over and over day after day, simply adding a small proportion of the pyro solution and of the carbonate of soda solution each day when he notices the time of development lags.

Pursuing a similar course with regard to the metol developer, I have ascertained that it works better and more evenly when a larger percentage of sulphite than is recommended in the formula is present, and will resist better any tendency to oxidation. About eight grains of sulphite to one grain of metol is the right amount. With such a solution and the addition of a small amount of potash, the development of quickly exposed plates to full detail becomes a certainty, while its strength is such that development will continue until the metol becomes exhausted. I have developed as many as a dozen 4×5 plates with four ounces of solution successively, one after the other, the last being as good as the first. The colourless solution at the beginning merely changed at the end to a light straw colour.

Reports recently show that a sodium-sulphite solution standing some time has a tendency to change to a sulphate which acts greatly as a retarder. For this reason I recommend the use of freshly mixed sulphite solutions. It dissolves so rapidly in water at ordinary temperatures that very little time is required to prepare a fresh solution. Metol is also quickly soluble, and one is much more certain of results to make the developer fresh than to keep it already mixed.

It is advisable to preserve a used metol developer in a tightly stoppered bottle, as it is useful in beginning the development of over-timed plates and in mixing with fresh developers.

In conclusion, it seems to be settled that sodium sulphite plays a very important part in the modern developers, and only the very best and purest should be used if good results are desired. F. C. Beach.

THE NEW TARIFF ON PHOTOGRAPHIC MATERIALS.

We quote the following particulars respecting the new American tariff from a transatlantic contemporary:—

On the 28th of August the new tariff law passed by the House of Representatives on August 13th, 1894, and known as the Senate Bill, became a law. We have made a separate list of the articles and chemicals relating to photography from an official copy of the Bill which we hope will prove useful. As a general rule, the reduction on most articles is small, but is particularly noticeable in the lens and glass schedules.

Photographs.—25 per cent. ad valorem; if printed or made for more than 20 years are admitted free.

Cameras.—Not mentioned, but are taxed according to the article of chief value of which they are made. If wood is the chief article, 25 per cent. ad valorem. If metal, 33 per cent. If a lens is attached, then 35 per cent. ad valorem.

Tripods.—Manufactured of wood, 25 per cent. ad valorem.

Lenses.—35 per cent. ad valorem (formerly 60 per cent.).

Photographic Dry Plates and Films.—25 per cent. ad valorem (formerly 60 per cent.).

Acetic Acid.—20 per cent. ad valorem.

Citric Acid.—25 per cent.

Magic-lantern Slides.—25 per cent. ad valorem (formerly 60 per cent.).

Albumenised or Sensitised Papers.—30 per cent. ad valorem.

Photographic Albums.—30 per cent. ad valorem.

Porcelain Pictures.—35 per cent. ad valorem.

Gelatine.—25 per cent. ad valorem.

Collodion or Celluloid.—40 cents per pound, 50 cents per pound if rolled in sheets.

Alum.—4-10 of one cent per pound.

Ammonia.—20 per cent. ad valorem.

Sodium Carbonate.—1-8 of one cent. per pound.

Sodium Sulphite.—25 per cent. ad valorem.

Hyposulphite of Soda.—25 per cent. ad valorem.

Nitrate of Silver.—25 per cent. ad valorem.

Bichromate of Potash.—25 per cent. ad valorem.

Chloride of Gold.—25 per cent. ad valorem.

Bichloride of Mercury.—25 per cent. ad valorem.

The following articles may be imported free of duty:—Pyrogallic acid, sulphuric acid, carbonate of potash, magnesium oxide and salts of uranium and iodine. Under paragraph 596, providing for the free entry of professional books, implements, instruments, and tools of trade in the actual possession at the time of the persons arriving in the United States cameras, lenses, plates, &c., may be brought in free.

The following paragraphs of the free list provide for the importation of works of art for exhibition purposes, and will be interesting to societies:—

"687. Works of art, drawings, engravings, photographic pictures, and philosophical and scientific apparatus brought by professional artists, lecturers, or scientists arriving from abroad for use by them temporarily for exhibition and in illustration, promotion, and in encouragement of art, science, or industry in the United States, and not for sale, and photographic pictures, imported for exhibition by any association established in good faith and duly authorised under the laws of the United States, or of any State, expressly and solely for the promotion and encouragement of science, art, or industry, and not intended for sale, shall be admitted free of duty, under such regulations as the Secretary of the Treasury shall prescribe; but bonds shall be given for the payment to the United States of such duties as may be imposed by law upon any and all such articles as shall not be exported within six months after such importation, provided that the Secretary of the Treasury may, in his discretion, extend such period for a further term of six months in cases where applications therefor shall be made.

"688. Works of art, collections in illustration of the progress of the arts, science, or manufactures, photographs, works in terra cotta, parian, pottery or porcelain, and artistic copies of antiquities in metal or other material, hereafter imported in good faith for permanent exhibition at a fixed place by any society or institution established for the encouragement of the arts or of science, and all like articles imported in good faith by any society or association for the purpose of erecting a public monument, and not intended for sale, nor for any other purpose than herein expressed; but bonds shall be given, under such rules and regulations as the Secretary

of the Treasury may prescribe, for the payment of lawful duties which may accrue should any of the articles aforesaid be sold, transferred, or used contrary to this pravision,and such articles shall be subject, at any time, to examination and inspection by the proper officers of the customs; Provided, That the privileges of this and the preceding section shall not be allowed to associations or corporations engaged in or connected with business of a private or commercial character."

The following is the paragraph relating to the free entry of paintings:

"575. Paintings, in oil or water colours, original drawings and sketches and artists' proofs of etchings and engravings, and statuary, not otherwise provided for in this Act, but the term 'statuary' as herein used shall be understood to include only professional productions whether round or in relief, in marble, stone, alabaster, wood, or metal of a statuary or sculptor, and the word 'painting,' as used in this Act, shall not be understood to include such as are made wholly or in part by stenciling or other mechanical process."

THE SALON CONFERENCES.

Conferences on artistic subjects relating to the Exhibition and to photographic art will be held at the Dudley Gallery, Piccadilly, on the Wednesday evenings upon which it is open to the public. Admission 1*s*. Short papers will be read, followed by discussions.

Programme and Synopsis.

Wednesday, October 10.—"How to Look at Pictures." By the Rev. F. C. Lambert. A few notes suggested by the present collection of photographs in the Dudley Gallery—Seeing and not seeing—What to look for—What not to look for—The Artist's message—The Artist's language.

Wednesday October 17.—By Mr. A. Horsley Hinton.

Wednesday, October 24.—"Arrested movement and a living pose." By Mr. Rowland Briant. Availability of arrested movement in serious pictorial work—The statuesque pose—The instantaneous pose—The living pose—Conditions for posing as regards movement—The practice of painters no guide—The photographer as the modern art theorist—A theory for the use of arrested movement.

Wednesday, October 31. "Early forms of pigment (or carbon) printing revived." By Mr. Alfred Maskell. Artistic possibilities of the process—Direct development without transfer—The paper, coating, development Mr. Rouillé-Ladevèze's method (Photo-sanguin)—The Antique Papier Velours and sawdust process—With examples and demonstrations.

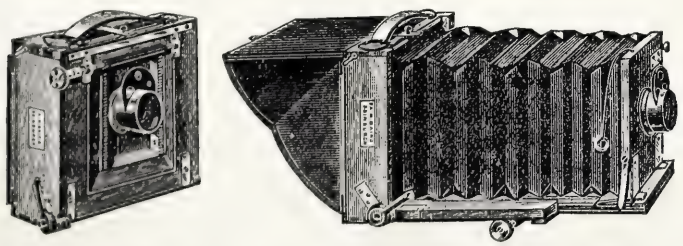
Questions and discussion invited after the reading of each paper. The chair will be taken at 8 o'clock punctually, and the Conferences close at 9.30 p.m.

Our Editorial Table.

The "Lothian" Cyclist Camera.

By Andrew H. Baird, 15, Lothian-street, Edinburgh.

Mr. Baird informs us in a circular that this camera has been devised for ladies, cyclists, and tourists generally, who desire a thoroughly efficient and portable instrument when on tour, but who do not wish to be burdened with a heavy field outfit. Let us see how this claim is borne out. It weighs, with lens and three double slides, 2 lbs. 6 ozs. It measures when folded up $5\frac{3}{4}$ in. × 5 in. × 2 in., and the slides are $\frac{5}{16}$ in. thick. We give a cut showing the camera packed and opened out. It has a shutter of the blind pattern



situated immediately behind the lens, is capable of great extension, and has a swing back. A focussing cloth may be dispensed with, its place being filled with a spring focussing hood, which when not in use folds close against the ground glass. Altogether, it is well designed and well made.

Photographic Enlargements: How to Make Them.

By George Wheeler, Manchester.

Although this, the third edition of Mr. Wheeler's book, sells only at a shilling, it contains very much that is practical and good concerning the production of enlargements. The author starts by describing the kind of negative required for producing the highest class of enlargements, and gives directions for the development and treatment of such negatives. Enlarging by daylight and by artificial light are individually treated of, and the desirable features in each pointed out, with a description of the best kind of enlarging cameras or lanterns to be used under special systems of lighting. Much attention is bestowed upon the printing processes best adapted for obtaining proper effects and tones, and, in brief, taking all in all, we do not know of any treatise on the subject that is more comprehensive and practical than this of Mr. Wheeler.

Catalogues Received.

Theobald & Co., 19, Farringdon-road, E.C., and E. G. Wood, 74, Cheapside. Both these are lists of lanterns and lantern slides and appliances, that of Mr. Wood being supplementary to a previous and more extended one. In a large measure, the subjects are put up in lecture sets.

News and Notes.

The retouching class has been resumed at the People's Palace, Mile End, by Mr. Redmond Barrett. The class is held on Tuesday evenings.

Percy Lund & Co., Bradford, are about to remove to more extensive premises (corner of Godwin-street and Thornton-road), where they are putting down new machinery.

Mr. A. Brooker, Photographic Chemist, 52A, Robertson-street, Hastings, has removed to more commodious premises at 21A, Wellington-place (close to Albert Memorial), Hastings. Mr. Brooker has increased his dark-room accommodation and stock of photographic requisites.

Royal Photographic Society.—Ordinary Meeting, October 9, at the Gallery, 5A, Pall Mall East, at eight p.m. Presentation of the medals and the President's address. Affiliation of Photographic Societies, meeting of Delegates, at 50, Great Russell-street, on Wednesday, October 10, at thirty minutes past seven.

Brixton and Clapham Camera Club.—The winter season of this Club will be inaugurated on Tuesday next, October 9, with a lantern lecture by Mr. J. A. Hodges, entitled *Through North Devon and Somerset with a Camera*. Tickets of admission may be obtained of the Hon. Secretary (Mr. F. W. Levett), The Clarence Rooms, 376, Coldharbour-lane, Brixton, S.W.

The unfortunate ending to the Dr. Cook arctic expedition, says the *Photographic Times*, has resulted in the loss of what would probably have been the finest collection of Greenland photographs ever made. A great number of the members were expert photographers, and many thousands of plates had already been exposed. These they were obliged to leave in the sinking vessel.

Wide-angle Lenses.—Colonel Gubbins writes: "On page 592 of The British Journal of Photography for the 14th ult., I noticed that you seemed to infer—in answer to T. Somes—that five inches is the shortest focus of a lens capable of covering a whole-plate. May I, for the benefit of T. Somes, draw attention to Mons. Gorde's advertisement on page 1280 of the Almanac for 1894, in which he states that a lens of 'three inches focus covers 9×7.' This might help T. Somes out of the difficulty."

The Woolwich Photographic Society will hold their annual business meeting on Thursday, the 11th inst., at eight p.m., at St. John's Schools, Wellington-street, Woolwich, when the usual statements of accounts and reports will be submitted to the members. The officers and council for the ensuing year will also be elected. All photographers are invited to attend any of the Society's meetings, which are held the second and fourth Thursdays in each month. Inquiries respecting membership should be addressed to the Hon. Secretary, Mr. J. Borthwick Panting, 3, Friars-villas, Old Charlton, S.E.

The Mayor of Loughborough.—A capital portrait of the Mayor of Loughborough (Alderman W. A. Cartwright) has been painted by Mr. R. Frost, of Baxter-gate, in that town. His Worship is depicted standing, attired in his civic robe of scarlet, with the mayoral chain and pendant. The right hand rests upon a bronze lion supporting the mace, and in the left is held a municipal document. The expression of the face is lifelike and natural, whilst the colouring throughout is all that could be desired, the artist having produced a work worthy of a place in any collection. In size the picture is three-quarter length, the canvas being sixty-six inches by forty-two inches.—*Nottingham Daily Guardian.*

During last week, says the *Star*, some photographs were taken privately at Windsor Castle of certain farm produce, for the information of the Queen. The incident marks a comparatively new feature in the management of the royal household. For many years, whenever a photograph was required for her Majesty, a professional sun artist resident in the town was employed. It was found, however, that the demand for mementoes of the ordinary events in the life of the Court became so great, that the Lord Chamberlain has been constrained to invest in a camera and a handy set of photographic appurtenances. The task of preparing the pictures devolves upon one of the Queen's servants, and by this method the risk of publication is thought to be lessened. The day seems to be approaching when the reports dispatched to her Majesty from the royal palaces will be regularly provided with photographic illustrations.

In the City of London Court last week, before Mr. Commissioner Kerr, an action was brought by the London Stereoscopic and Photographing Company (Limited), of Cheapside, to recover the sum of 10*l.* against the Wiltons (Limited), of 21, Garlick-hill, E.C., for the alleged unlawful detention of certain blocks. It seemed that the plaintiffs had an order from Welch and Sons to print a catalogue. They sub-let the contract to the defendants, who had to make certain drawings on blocks. The plaintiffs alleged that the defendants had obtained a subsequent contract from Welch's direct, and were using the blocks which they (plaintiffs) had paid for. The Stereoscopic Company's solicitor said what they complained 'of most was the dishonesty of the defendants in using their blocks to compete in the subsequent contract.—Mr. Commissioner Kerr said that, if he had to sit there with a view to correcting all the dishonesty of London, he soon would be in a lunatic asylum. (Laughter.) He found for the defendants, because he said he must hold that the plaintiffs had no right to the blocks under the circumstances.

The Hackney Photographic Society's Annual Exhibition, will be held at Morley Hall, Triangle, Mare-street, Hackney, on Tuesday, Wednesday, and Thursday, November 20, 21, and 22, 1894. The Judges will be Messrs. Valentine Blanchard, Ralph W. Robinson, and E. J. Wall. The Classes are:—Members: Class A, any picture taken since last Exhibition; Class B, pictures taken during membership; Class C, best picture taken in hand camera (enlargements permitted); Class D, stereoscopic—set of six (prints or transparencies); Class E, set of six slides. The following are Open Classes (entries in these classes may be priced for sale at the option of the exhibitor): Class F, for any picture not previously having received an award; Class G, for portraiture and *genre* (in this class, the work may be that of a firm, and need not be that of the exhibitor alone); Class H (Champion Class), for pictures which *have* previously received awards. Class I, for six lantern slides *not* having previously received awards. Awards will be made as follows: Class A, two silver and one bronze medal; Class B, two silver and one bronze medal; Classes C, D, E, silver and bronze medal in each. Silver medals for C and D are presented by W. L. Barker, Esq., and F. Houghton, Esq., respectively; Class F (Open), two silver and one bronze medals; Classes G and I, silver and bronze medals in each; Class H, gold and silver medals; Certificates will be also awarded at Judges' discretion; Apparatus, silver medal for most interesting exhibit. Entry forms, and all further information respecting Exhibition, can be obtained from W. Fenton-Jones, Hon. Secretary, 12, King Edward-road, Hackney, N.E.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
8	Camera Club	Question box opened.
8	Central Photographic Club	*Exhibitions and Exhibitors, with particular note concerning present Exhibitions.* A. H. Wall.
8	Lantern Society	
8	Norfolk and Norwich	
8	North Middlesex	
8	Putney	
8	Richmond	
9	Birmingham Photo. Society	
9	Hackney	Members' Lantern Night.
9	Manchester Amateur	
9	Newcastle-on-Tyne & N. Counties	
9	Paisley	
9	Rochester	
9	Royal Photographic Society	The President's Annual Address and the Presentation of Medals.
9	Stockton	
9	West London	
10	Central Photographic Club	*The Preparation of Solutions.* E. J. Wall.
10	Croydon Camera Club	*Lantern-slide Making for Beginners:* Pyro, also Hydroquinone Development, G. R. White; Ferrous-oxalate Development, Mr. Woodcock.
10	Ipswich and Suffolk	
10	Leytonstone	
10	Munster	
10	Photographic Club	Members' Open Night.
10	Southport	
10	Stockport	
11	Birkenhead Photo. Asso.	
11	Camera Club	*Miscellaneous Slides.* G. A. Bell.
11	Cheltenham	
11	Glossop Dale	
11	Hull	
11	Leicester and Leicestershire	
11	Liverpool Amateur	*The Scottish Alps.* W. Lamond Howie.
11	London and Provincial	Lantern Entertainment, Members' Slides.
11	Manchester Photo. Society	
11	Oldham	
12	Bristol and West of England	
12	Cardiff	
12	Central Photographic Club	Open Evening.
12	Croydon Microscopical	
12	Halifax Camera Club	
12	Holborn	
12	Ireland	
12	Maidstone	
13	Central Photographic Club	Conversazione. Opening of the Salon, and R.P.S.G.B. Rejected Exhibition.
13	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

September 27,—Mr. H. Snowden Ward in the chair.

Messrs. F. Marsh and A. E. T. Western were elected members.

An Electric Retouching Pencil.

Mr. A. S. Harry, of New York, exhibited an electric retouching device, of which the following is a description. The pencil is attached to a small battery, which is held in the hand:—

"No change need be made in the retouching stand, for the 'device' is held in the hand the same as a pencil. There is no danger of leading the negative, or making holes through the film. By turning the small milled wheel on the pencil-holder occasionally, the pencil receives a new cutting edge, and it is possible to retouch for hours without removing the pencil to resharpen it. The retouching device makes over 2000 strokes per minute, and will deposit the lead as rapidly as one can direct the pencil point. It also furnishes the 'touch.' The battery furnishes the motive power. The retoucher lightly guides the retouching device, which will do the work as fast as it can be guided. Any retouching pencil or retouching medium suitable for hand work can be successfully used."

The Judges in the competition for the production for photo-mechanical purposes of a negative and print from an engraving announced their decision to be that Mr. Teape had produced the best results, Mr. Ashby coming second, and Mr. A. J. Brown third.

Mr. Teape said the developer he employed was—

Hydroquinone	6 grains.
Potassium bromide	2 ,,
Caustic potash	2 ,,
Sodium sulphite	30 ,,
Water	1 ounce.

He used Paget Phœnix plates. His greatest difficulty was to get the lines to show in the high lights; in the darker parts they showed easily. He also said he had found that the stain produced on negatives (in drying) by the new methylated spirit could be obliterated by immersing the plate in pure alcohol.

Mr. T. E. Freshwater read a paper on *Limelight Jets and the Electric Light in the Lantern* (see Lantern Supplement).

In the course of some remarks that followed the paper, Mr. Haddon threw doubt on the candle power claimed for one of the jets, viz., 800.

Mr. Freshwater said he believed it to be correct.

Solubility of Bromide of Silver in Ammonia.

A question in the box inquired the solubility of bromide of silver in ammonia ·880, and in a solution one quarter that strength.

Mr. F. B. Grundy said it depended on the bulk of ammonia in relation to the bulk of silver.

Mr. A. L. Henderson inquired how much excess of potassium bromide was required to dissolve bromide of silver?

Mr. A. J. Brown said that four times the weight of bromide of silver was mentioned as the proportion in the Almanac for 1880.

Discoloured Matt Gelatino-chloride Paper.

Mr. P. Everitt had recently bought some matt paper which was brown; another make he also found of an orange tint. He had opened the tubes in the dealer's shop, so as to see the actual condition of the paper before taking it away. One could see in what condition albumen paper was when buying it, but, as regards gelatino-chloride, we were at a disadvantage.

The Chairman quoted an instance of the bad-keeping properties of the paper when exported.

Mr. Henderson advised the use of collodio-chloride.

Mr. W. E. Debenham was of opinion that the same kind of results were not obtainable with collodion paper as with gelatine—the former gave a result resembling that of an albumen print.

Mr. Henderson dissented from this view.

Mr. W. Cobb showed some excellent results on six weeks old matt paper.

After other discussion, the meeting terminated.

PHOTOGRAPHIC CLUB.

September 26,—Mr. A. Mackie in the chair.

Mr. E. W. Foxlee said that a custom of the Club had fallen into disuse, viz., that during the Exhibition the Club had hitherto invited country photographers to visit the Club-room on Wednesdays. He formally proposed that a letter be sent to all the journals embodying the invitation.

Mr. F. A. Bridge seconded, and it was carried unanimously.

Mr. J. Nesbit showed an album of views from negatives taken in a hand camera by a Mr. Treadway. He considered the whole series very creditable. He also showed two enlargements on bromide paper, his own work. He asked if the results were what could be considered good with the amidol developer.

Mr. Bridge was of opinion that less exposure and development would have been better.

Mr. Sinclair showed another sample of Adams' new finder.

Mr. Frank Haes presented a picture of the late Mr. Levy.

The Hon. Secretary was instructed to have the picture suitably framed.

The question of handling gelatino-chloride paper was again discussed. The Chairman said that he had made two prints which were equal to albumenised paper.

Mr. Tottem said that it depended entirely upon the operator, instancing a well-known firm, when first issuing their paper, who found it necessary to send their head demonstrator some hundreds of miles in order to superintend the work in the printing rooms of a large professional photographer. He obtained perfect results from 16 × 20 direct negatives, but they were not obtained previously or subsequently. Mr. Tottem quoted from memory, but thought the facts were correct.

The Chairman informed members that he obtained his good results after working the formulæ quoted by the *Amateur Photographer*, viz., first mix the sulphocyanide in water, then add a few drops of chloro-platinite of potassium, then add the gold. This formed a yellow-tinted solution.

Croydon Camera Club.—By kind and special permission of Her Grace the Duchess of Marlborough, a party of members, in charge of the President, Mr. Hector Maclean, on Wednesday, 26th ult., visited the Deepdene. Although fourteen had notified their intention of participating in this, the last of this season's whole-day photographic outings, in consequence of the morning being a pouring wet one, the attendance fell short of the above number. Those who had the enterprise to start, in spite of the discouraging weather, were, however, amply rewarded, for the light and other conditions proved eminently suitable for the interesting subject-matter, and both the exterior and interior scenes were found to be exceedingly attractive; the only regret felt was that not enough plates were taken to expose upon the almost endless noteworthy and entrancing objects of interest. Delightful as are the prospects from all parts of the grounds, of the mansion and its pleasaunces, the chief artistic and historical interest centres in the sumptuous interior. The famous hall, with its splendid statuary, its stirring reminders of Blenheim's momentous battle, and its grand staircase formed but a small pretaste of a stately succession of many other impressive chambers, and peerless treasures of statuary, painting, and ceramics, of which last specially to be mentioned is the wonderful collection of antique Roman pottery in the Etruscan Room. It is hardly necessary to say that all the above afforded the party unstinted pleasure, and fully occupied the available time. It may be added, for the benefit of other photographers, that the Bull's Head, Dorking, satisfactorily supplied high tea, and at a moderate charge.

Hackney Photographic Society.—September 25, Mr. R. Beckett presiding.—The Hon. Secretary distributed samples of Austin Edwards' films and plates for trial, and reminded the members that this would be the last meeting of the club at its present rooms. The next meeting (October 2), would be the occasion of taking possession of the new meeting room at the Pembury, Amhurst-road. Work was shown by Messrs. A. Barker, Grant, Hensler, and Dean. The latter gentleman's prints had been toned with zenotype, and the tones were quite equal to those produced with gold. Mr. S. J. Beckett read a paper on *Hand Cameras*, and after, referring to and criticising the various types to be found on the market, said that the hand camera which was capable of doing any and every kind of work had yet to be made. He then proceeded to describe the most desirable features such a camera should possess. These were as follows: The size of the plate should not be less than $6 \times 4\frac{1}{2}$; it should have a strong case, and be brass-bound if much travelling had to be done. A leather covering soon became scratched, so the outside should be plain wood, and dead-blacked, not polished. A strong sling strap should support it—straps fastened with screws were apt to break away with rough usage. The most important part was the lens; it was necessary to have a good one. The camera should be made to take three lenses, one of six inches focus for general work, others of respectively three inches and nine inches focus for special conditions. With these lenses the range of work possible would be great, for, besides the foci mentioned, the halves of the several lenses could be used to still further increase the capacity of the instrument. As the range of the camera should be for subjects requiring exposures varying from "time" to one two hundred-and-fiftieth of a second, it was necessary to have two shutters, for there was not one at present to be had with the range above mentioned. These should be time and focal plane shutters. The camera should be fitted with a tripod screw, and the back should open for focussing. A focussing scale should also be made on the top; there should be a swing back and also a rising front. The use of both together would not generally be necessary, but in some cases one would be useful to supplement the other. The finder should be of good size, not less than one-half the size of the plate. The twin-lens principle was good, but in this case, for such a large lens, would make the camera too bulky. Dark slides should be used, not a magazine; they should be carried in a separate case to equalise the weight. A discussion followed the paper, many members taking part and asking questions, to which Mr. Beckett replied.

Richmond Chmera Club.—The following is the report for the year ended August 31, 1894:—In presenting their Fourth Annual Report, the committee are glad to be able to state that the Club continues in a very satisfactory condition. The membership has been fully maintained, the interest of members in the Club and its proceedings has evinced no sign of diminution, and the finances show a balance on the right side. At the weekly meetings during the winter session a varied and interesting programme was provided, comprising demonstrations and papers by many well-known photographers—amateur and professional—as well as members of the Club, with perhaps an almost undue proportion of Lantern Nights. A new departure in the latter connexion was the institution of Ladies' Evenings, of which there were seven during the session, and which were patronised by good and appreciative audiences. In response to an invitation from the committee of the Richmond Athenæum, a lantern display was also given before that society in the College Hall, and kindly received. Considerable additions have been made to the Club library, but it is not as much used as it might be. At the meetings of the societies affiliated to the Royal Photographic Society of Great Britain, the Club has been ably represented by its delegates, Messrs. Huddy and Bickerton, whose reports of the proceedings have been duly submitted to the Club from time to time.

West Surrey Photographic Society.—The Annual General Meeting of this Society was held at the Public Library, Lavender-hill, on Wednesday, September 26, Mr. Winsford (Vice-President) in the chair. The Secretary's and Treasurer's reports having been read and passed, the Chairman, in a few happy remarks, congratulated the Society upon its improved financial position, and, referring to the annual Exhibition, expressed his opinion that each year as the Society progressed, the exhibitions gained both in numbers and quality of the work sent in by the members. Special votes of thanks were unanimously passed to Mr. Winsford and Mr. G. H. Seward for the good work they had done for the Society; and the meeting then proceeded to elect the officers for the ensuing year, who were as follows:—*President:* Colonel J. Gale.—*Vice-Presidents:* Messrs. W. Winsford, J. L. Lyell, F. H. Smith.—*Committee:* Messrs. Arkell, Bulbeck, Eastmead, James, Martin, Pointon, Thompson, and White.—*Librarian:* Mr. J. Bull.—*Lanternist:* Mr. W. Graham.—*Secretary and Treasurer:* Mr. George H. Seward, 186, Lavender-hill, S.W.—*Assistant Secretaries:* Messrs. J. Bond and J. Bull.—The meeting was then dissolved into a conversazione, when a number of prints were exhibited and discussed. These were afterwards forwarded to the President for judging, he having offered a prize for the best four pictures illustrating Tennyson's *Brook*.

Liverpool Amateur Photographic Association.—September 27, Mr. A. Tyrer (President) in the chair.—Messrs. William Loughran, R. William Brighouse, William Shillinglaw, L.D.S., James Blackledge, C. W. Hayward, M.D., and Thomas John Flynn, C.C., were elected members of the Association. Mr. Adolph W. Beer gave a lecture, entitled *Historic Homes and Ancient Manor-houses*, illustrated by 150 lantern slides. After a few remarks, claiming as a special feature the love of an Englishman for his home, the lecturer took the audience to some of the most noted historical and ancient castles, halls, and manor houses made famous in English history, notably Hatfield, Penshurst, Chirk, and Powis, and Stokesay. Owing to the excellence and artistic qualities of the slides, together with a fund of useful and interesting history of these private homes, a most enjoyable evening was spent by a well-attended meeting of members. The President congratulated the members upon the success of one of their number, Mr. T. F. Lloyd, carrying off a gold medal at the Belfast Photographic Exhibition.

FORTHCOMING EXHIBITIONS.

1894.		
October 5, 6	.....	*Royal Aquarium.
,,	5–Nov. 3 ...	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,,	5–Nov. 14...	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,,	22, 23	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,,	22–27	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17	.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,,	20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,,	21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,,	23–Dec. 1	*Stanley Show (Photographic Section).
,,	27–Dec. 1	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,,	29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
1895.		
March 25–30	.....	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 18,190.—"The Combined Dark Slide and Developing Tray." A. K. Page.—*Dated September*, 1894.

No. 18,282.—"A Process for Sensitising Photographic Paper." C. Beadle.—*Dated September*, 1894.

No. 18,290.—"An Improved View Finder for Photographic Cameras." H. Ransom and A. D. Thornton.—*Dated September*, 1894.

No. 18,353.—"An Improved Process and Apparatus for Focussing Images in Cameras." L. H. Chase.—*Dated September*, 1894.

PATENTS COMPLETED.

Improved Optical Lantern.

No. 1091. Franz Heinrich Klodt, Frankfort-on-the-Main, Germany.—*September* 1, 1894.

My invention relates to improvements in optical lanterns whereby pictures or images can be reproduced not only on walls, screens, or the like, in horizontal direction, but also vertically, on the ceilings of rooms, thus affording a practical means of teaching astronomical and other similar subjects in schools and the like.

[The patentee attains this end by placing a mirror, set at an angle, in front of the emerging rays. The numerous possessors of lanterns who have long done this are scarcely likely to discontinue the practice because of its now having been patented.—Ed.]

An Improved Shutter for Photographic Cameras.

No. 14,277.—David Morgan, 76, Broad-quay, Bristol.—*September* 1, 1894.

This invention, which relates to shutters for photographic cameras, consists in the provision, in one continuous or endless piece, of an exposing and safety blind arranged to run over rollers fitted to rotate in the shutter box towards the top and bottom thereof respectively. The blind is composed of opaque flexible material usually employed in photographic shutter blinds, as, for example, black mackintosh. It has two apertures, by means of which, when the blind is adjusted or set with that object, light is afforded unobstructed access to the camera lens. Similarly, when the shutter is closed, the blind affords a twofold shield against the penetration of light.

Towards each end of the lower roller, which is a spring roller, is attached a cord, preferably of silk. One end of each cord is, after attachment, wound once (or, if need be, twice) round the roller, and is then carried up over the upper roller. The other end of each cord is carried up from the opposite side of the lower roller to meet the end conducted, as aforesaid, over the upper roller. The two ends thus meeting are tied or otherwise connected together, and are attached to the blind.

Accordingly, the blind being thus connected to the lower roller moves with it in one direction when setting for focussing or exposure, and with it also in the reverse direction when released. A notched disc and spring trigger pawl are adopted for retaining the blind when set, and the usual pneumatic ball and tube are employed for release.

The shutter is arranged for making both "instantaneous" and "time" exposures.

Improvements in Photographic Cameras.

(Communicated by Nicolai Hansen, 7, Rue du Pot de Fer, Paris.)

No. 19,836. Henry Harington Leigh, Assoc. M. Inst. C.E., Fel. Ch., Inst. P.A., F.I. Inst., 22, Southampton-buildings, Chancery-lane, London.—*September* 1, 1894.

My invention relates to improvements in photographic cameras.

In carrying it into effect, the frame of the camera is of the ordinary construction. It is provided with an internal box, pivoted transversely upon trunnions. This box is adapted to receive the sensitive plates, and may be provided with an opaque one closing it to prevent light getting at the other. An external handle is provided to turn the box upon its axis. The box has two openings, one through which a plate is expelled, and the other through which it is returned. One side of it also opens to permit of access to the plates. There is an opening in the camera through which the box can be passed, and this opening is fitted with a covering plate to exclude light.

In front of the box and on each side of the camera are series of rails or inclines, adapted to serve as ways for the plate while the latter are being moved from and back into their box. The top way of the series has a spring finger. At the bottom of the camera there is a rod, which can be turned about its axis and slid to and fro. It carries two arms at right angles with itself and with each other.

When the box full of slides has been introduced into the camera, it is turned by the handle already mentioned up into a vertical position with the open side of it towards the lens. After the exposure, the box is turned through a quarter of a circle down into the horizontal position. The rod above mentioned is then moved till one of its arms, horizontal up till then, is vertical, and enters the box behind the front plate. A pull on the rod brings this plate into the lower ways, the spring finger supporting it, and the plate sliding horizontally. When it is quite out of the box, the plate is balanced by the spring, and rests against the upper ways. The box is then turned further through 45°, and the rod as much, so that one of its arms is in front of the plate. When the rod is pushed, the plate, guided by the ways, is returned to the box behind the others. The box is then turned into its original position. When the box has the opaque plate above mentioned, the latter is shifted to the rear of the others before the first exposure is attempted.

A box full of exposed plates is removed from the camera and replaced by one full of fresh ones.

This invention does not limit me to the precise details of construction mentioned above. For example, the inclined ways may be replaced by horizontal ones at the levels of the respective openings in the front of the box, modifying the spring fingers accordingly. And any other of the above-mentioned details or parts may be replaced by any other detail or part, respectively its functional equivalent.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ALKALIES IN DEVELOPMENT.

To the Editor.

Sir,—Your leading article of September 21 draws attention to a matter in which photographers have much to unlearn, viz., the influence of the amount of alkali in development.

All my experiments (many of which are detailed in a paper in your Journal of February 23, 1894) point to the conclusion you mention, viz., that with pyro, as well as with modern developing agents, the amount of alkali (provided, of course, that the minimum sufficient is present) has no practical influence beyond quickening or lengthening development.

The truth goes much beyond this, as the same rule generally applies to the other component parts of a developer (the power of controlling fog always excepted). In other words, the one great power which a photographer possesses in development lies in carefully timing it, and this power he usually exercises by so altering the constituents of the developer as to bring the total time of development to the standard of time to which he is accustomed.

When fixed alkalies are used, a perfectly simple and efficient guide to the length of development is provided by my discovery of the fact that, with a given developer, the length of time of appearance of the image varies in exact ratio to the time necessary to attain a given printing density. I think that he general use of the volatile alkali-ammonia and the rapid falling off of developing power of the solution has much to do with the misconceptions which exist. Photographers have to add ammonia during development in order to keep up its activity, and then attach mysterious importance to this act of necessity.—I am, yours, &c., Alfred Watkins.

Hereford, September 29.

IMPROVEMENTS IN THE PRODUCTION OF PHOTOGRAPHIC NEGATIVES.

To the Editor.

Sir,—I must confess that I was astounded on reading in your last issue that Dr. Eugen Albert is making a claim for English patent, under date August 25, 1894, 'For the production of screens and autotype negatives, [by using] stops which contain more than one opening, or which contain one opening which is not circular.' Either Dr. Albert is egregiously ignorant of the processes in vogue in England and America, or he has the hardihood to claim a patent for ideas which he must know have long been more or less public property.

It may be remembered that, in my "Photo-mechanical Notes" in your issue of May 18 of this year, I dealt somewhat fully with the system of adjusting the distance of the screen and of using odd-shaped stops, and what I then described I had practically tried quite a year before. The system, however, reached me from America, where it had long before been in use. The theory and practice of distancing the screen were described by Mr. Max Levy in the *Photographic Times Almanac* for 1892, and, if I mistake not, Mr. Levy already holds a patent in this country for the use of stops with openings otherwise than round. At any rate it is, to the best of my recollection, fully a year ago when I heard that Mr. Max Levy was about to patent in the United States and in this country a new form of stop. Further, I can say that there is hardly any important process studio in London in which stops of various odd shapes are not in use, and have been used long antecedent to Dr. Albert's application for protection. What may be the object of this eminent German worker I cannot fathom,—I am, yours, &c., Wm. Gamble.

CUTTING PRICES.

To the Editor.

Sir,—The letter from "Poor Photographer" in last week's issue may to many look small and insignificant, but in reality is one of the greatest importance to every professional. It exposes only one instance of the wholesale dealers running opposition establishments to their own clients.' It may be perfectly legal for them to do what they please with their stock and capital, but it is certainly not pleasant to hear of the *gentleman* who blandly solicits your orders popping round the corner, after he has *finished* you, to the studio where the wholesale house has an interest, either direct, or indirect, and utilising hints and business remarks usually communicated in those confidential chats (of course to your disadvantage). In my opinion it is *not* the competition from the amateur we should fear, so much as these unfair *business* transactions, that are practised in different parts of both town and country.

I think, if it were more generally known, the profession could deal with this subject in a most complete and satisfactory manner. Here's something for the N. A. P. P. They should put on their spectacles, and look into these matters. Unity being strength, I have no doubt a powerful committee might suggest a remedy. Card enclosed, not for publication, at present.—I am, yours, &c., Focus.

September 29.

To the Editor.

Sir,—"A Poor Photographer," in your issue of September 28, states "that the representative of a well-known house was running a studio with good *cartes-de-visite* at 2*s.* 6*d.* a dozen against his own (wholesale) customers." Is this true? I am afraid not. If true, why is "Poor photographer" afraid of his name? He makes a general and serious charge againt a large body of travellers. He does not even state the name of the town.—I am, yours, &c., Charles Booty.

Walthamstow, October 1, 1894.

GOLD POISONING.

To the Editor.

Sir,—Doubtless the photographer has to deal with a good many poisonous chemicals, and it is well he should make himself thoroughly acquainted with their antidotes. In these hard times it is very unlikely he will be required to exercise this knowledge in a case of gold poisoning, hence the following from *Guy's Hospital Reports*, vol. i., ought to prove interesting.

Here Dr. Stevenson mentions a case of a boy admitted with symptoms of gold poisoning on October 22, 1893. He arrived at the hospital in a state of collapse, and suffering from intense thirst, diarrhœa, and vomiting.

He had purple-black stains about the mouth, and gold was detected in the fæces. It appears he was playing about a dust-heap, and picked up a tube of gold, which he opened, and proceeded to tone himself, with the above results.

He was put under treatment of white of egg and milk, with the application of warmth. The vomiting soon ceased, and he was discharged well on November 4.

Clearly such a form of combined bath is not an acquisition to photographic processes.—I am, yours, &c., J. B. FINDLAY.

London, September 28.

PHOTOGRAPHERS' HONEST WORKMEN SOCIETY.

To the EDITOR.

SIR,—That I am a foreigner you will have no difficulty in finding out, by the funny subjects I put before you.

When I was operator in Woolwich, I was several times asked by the customers of the firm to do private work for them; I declined without hesitation, considering I was engaged by the firm as *bonâ-fide* worker. Now, I know that such outside offers are accepted and executed, that negatives and prints have been taken (the latter sometimes paid for), then sent to an enlarging firm to be finished—and the said customer felt pleased at having made a bargain.

Another instance, the operator at one firm takes views, &c., as private hobby, and the printer of the same house prints them at home, and they are put on the market at prices—well, it is cheapness, not the goodness, which seems to pay in this sort of thing.

Customers are sometimes invited to have groups taken at home, at exceptional hours and prices, by men paid to look after their employers' interest.

Now, do you think all this is right? Will you please, for the benefit of the professional, give your candid opinion on this matter, and show these workmen what is honest and straightforward, and indicate a way for them to form themselves into a society or body of honest men, so that the employers know where to find serviceable men when they want them, I should even say, need them, in these days of depression, when the professionals are more or less blaming the amateur for the decay; but, in my opinion, the underhand workman amateur is the most objectionable, not to say more. Please excuse, once more, that

AUDACIOUS OPERATOR.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.—APPARATUS SECTION.

To the EDITOR.

SIR,—We shall feel obliged if you will allow us to state that the Society provide an attendant to describe the apparatus shown at this Exhibition. He, or in his absence, the Secretary, is in possession of a key to each show case, and we feel sure that no obstacle will be put in the way of any one desirous of examining a particular piece of apparatus.

We ask you to insert this on account of the remark in your review of this section in last week's issue, containing the following: "We can readily discover through the panes of the glass case," &c.—I am, yours &c., THOMAS R. DALLMEYER, *Managing Director,*

pro J. H. Dallmeyer, Limited.

25, *Newman-street, London, W., October* 3, 1894.

PHOTOGRAPHIC SOCIETY OF INDIA'S EXHIBITION.

To the EDITOR.

SIR,—As already announced, the Seventh Annual International Exhibition of the Photographic Society of India will be held in Calcutta in February next.

May I ask you to inform your readers that I shall be glad to send a prospectus to any intending exhibitor, and that, if they care to send their exhibits to me at 50, Great Russell-street, before the end of November, they will be packed and forwarded to Calcutta without expense or trouble to them.—I am, yours, &c., R. CHILD BAYLEY.

50, *Great Russell-street, Bloomsbury, London, W.C., September* 27.

Answers to Correspondents.

PHOTOGRAPHS REGISTERED:—

George William Crook, Eccles.—*Portraits of the Briggs family of Cricketers: J. Briggs, sen., J. Briggs (Lancashire County), J. B. Briggs, and J. A. Briggs.*

Thomas Charles Turner, 10, Barnsbury-park, N.—*Six portraits of Mr. W. S. Penley, in "Charley's Aunt."*

A. M.—Received, and in type; thanks.

W. T. WILKINSON.—Will be noted should occasion arise.

Z. O. O.—Permission is required, but it is readily obtained. Communicate with the Secretary of the Society.

GILBERT STRINGER.—Surely an *employé* in a boot factory has a perfect right to start as a photographer, and charge what prices he likes? This is a free country still, we are glad to say.

M. E. C.—1. The presence of citric acid in the developer will have no deterrent effect on its powers. 2. The first-named for rapid work, the second for time exposures. 3. The prints are probably toned with platinum.

HORTON.—Burton's *Printing Processes* (Marion & Co.), or Wilkinson's book will answer. Robinson's book is published by Sampson Low & Co. Post-cards will obtain you the prices. For the moment, we do not remember them.

S. R. W. asks us our opinion of the financial position of several well-known photographic concerns.—One would have thought it was obviously out of our province to answer such questions as this, even if we were in a position to do so.

E. ROBERTSON.—Various colours may be obtained by employing different processes; but there is only one process by which any colour that may be desired is obtainable, and that is the carbon process. There is little question that this is the process for your purpose if you wish to obtain "every colour."

ALPHA asks our opinion as to whether we think "200*l.* a fair sum to pay with the apprenticeship of her son in a moderate-price portrait business for four years, at an average salary of 7*s.* 6*d.* a week for the term?"—Unless a great deal more is stipulated for than our correspondent mentions, we should say the terms are exorbitant, and the money, for the youth's benefit, had better be expended in some other and more advantageous direction.

ORTHOS.—A slight rinse in both instances should be given, though it is not imperative. If eosine be used in place of erythrosine, the same proportions and procedure may be adopted. The proportions were not given by the author, as probably they will vary with different brands of plates. A few experiments with those you employ will determine what best suits them.

LENS asks "if any of the new tele-photographic lenses are as rapid (quite regardless of their greater bulk and weight) as the lenses used on hand cameras, say, working at *f*-5·6, and whether they can be used on hand cameras?"—They are all much slower than lenses of the aperture named; they can, of course, be used on hand cameras if the cameras be held still during the more prolonged exposure necessitated.

DARK DAYS.—If you communicate with the local authorities, if they are undertaking the electric lighting themselves, or with the contractors, if they are not, you will obtain the cost of the current. We cannot say what it will be, as it, of course, varies in different districts. Whatever the charge may be, we surmise the cost will be much less than if it were generated on the premises, when the cost of plant—some hundreds of pounds—and its working are taken into consideration.

A. SCHRODER (Leipsic).—Although the ferrous-oxalate developer is still used on the Continent, and is the one advocated for testing the speed of plates under the Hurter & Driffield system, it is rarely used in this country for negatives. Pyrogallic acid is still the favourite here; probably more negatives are developed by that than with all the other developers together. If you intend offering your services as operator here, we should recommend you to make yourself *au fait* with the pyro developer.

W. BARNES.—1. The proportions will depend upon the gelatine used. A thin solution is all that is required. Place the print and the glass in the solution and squeeze together in the usual way. 2. Yes, collodion is used, and the same solution of gelatine that is employed for opalines will do for enamelling. 3. Ordinary water colours as supplied by artists' colourmen are what are used for working up enlargements. As you seem to know nothing of this class of work, we should advise you to obtain a few practical lessons. It would save a lot of time in the end.

SCOTTY writes as follows: "I, and many of my friends up North, find that we have far more yellowed and rapidly fading prints on gelatine paper, though it has been so short a time in vogue, than we have on albumen paper, although the latter are much older. Is this the experience in the South, or is it due to local circumstances, such as the water—the atmosphere I can scarcely imagine could be a cause?"—Yellow prints on gelatine paper are, we surmise, quite as prevalent in the South as they are in the North, so, no doubt, are fading prints on albumen paper. The water has no more effect in the one case than in the other. It is quite as easy to make fugitive prints by the one process as it is by the other.

S. E. W. says: "A few weeks ago I bought a small Albion press, second-hand, for experimenting with collotype. Every plate I have put in it, when sufficient pressure was used to obtain a print, has broken. I have obtained some glass half an inch thick, and one plate three-quarters, and they have all broken unless very slight pressure was put upon them, and I am certain there was no grit or anything of the sort under the plate. There must be some way of obviating this, or how do professional collotypers get on?"—It is clear that the surface of the platen of the press is not true. The only remedy is to send it to a press-maker, and get it replaned, or be supplied with a new one in the event that the present one cannot be trued up. The defect complained of is not at all uncommon with old presses.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1797. Vol. XLI.—OCTOBER 12, 1894.

OUR FORTHCOMING ALMANAC.

We have entered upon the preparation of the British Journal Photographic Almanac for 1895, and, as in past years, we shall be pleased to receive short contributions on practical subjects for its pages from those of our readers who may desire to record the results of their experiences and experiments. Not only do we hope that all those of our older friends, who for many years have kindly responded to our invitation, will once more find a place in the pages of the Almanac, but we express a wish that the constantly increasing number of our younger readers will also consider the invitation open to them.

It will be an additional pleasure to us if intending contributors will forward their articles as soon as possible, in order to avert the chance of their being omitted through lateness of arrival.

Secretaries of Societies, and especially of those established since the appearance of the last Almanac, if they have not already done so, will oblige us by at once forwarding lists of officers and other details for inclusion in the directory of Photographic Societies, in order that the list may be made complete.

The Publishers desire us to remind intending advertisers that the announcement pages of the Almanac are rapidly filling up, and that the last day for the receipt of orders has been fixed for Wednesday, October 17.

AMMONIA FUMING OF PAPER.

The ammonia fuming of printing paper was never received in this country with a tithe of the favour bestowed upon it in America. In that country few, if any, of the professional photographers would so much as dream of exposing a piece of albumenised silver paper under a negative until it had been well fumed by exposure to the vapour of ammonia, and fuming boxes formed part of the apparatus in every printing room.

The claims made on behalf of fuming are that greater sensitiveness is imparted to the paper, superior brilliancy of the print results, less gold is required in toning, and the prints, on the whole, are more permanent. We believe that, in a dry climate such as that of America, these claims may be considered as substantiated; some of them we know, from personal experience, may assuredly be so.

In what manner printing-out gelatine emulsion paper is affected by a preliminary fuming must be left for another occasion; but, in the mean time, we can very strongly assert its value in imparting to some so-called permanent ready-sensitised papers a certain facility of toning which they appear to have lost by keeping, although they had lost but little of their purity of colour and printed well enough, only refusing to tone, no matter what expenditure of gold was accorded them.

How to Fume.—Provide a box of about twenty-four inches high, and arrange by means of laths to have suspended in it enough sheets of paper to be required for the printing for one day. The sheets should not come in contact with each other, and no more paper should be operated on at a time than is to be used that same day. We have read that fumed paper will keep ready for use for several days, but, in the climate in which we used it, it would not keep over the one day. The box must have a close-fitting cover. When the paper is all suspended on a suitable light framework, a little ammonia, say an ounce or more, is poured into a flat dish, and introduced so as to rest on the bottom of the box. In one of the fuming boxes we had constructed we had the bottom in the form of a drawer, like those in common use in birds' cages, which, when the paper was *in situ*, we drew out, and placed thereon the flat porcelain dish containing the ammonia, and which, when closed, was sufficiently tight-fitting not to allow the fumes to escape. But the precise construction of the fuming box is not of vital consequence. We know of one large firm whose fuming box is constructed like a cupboard, with a front opening like a door.

It is suggested by some to aid the evaporation of the ammonia by a slight degree of warmth, such as that imparted by placing the ammonia dish on a warm slab; but, unless the weather be very cold, this is not to be recommended. One point to be observed is to have the strongest ammonia procurable, such as ·880. It has been found by experience that a long fuming over weak ammonia gives a print that has a much less satisfactory tone than a shorter exposure when the ammonia is strong.

The duration of the exposure to the fumes cannot be predicated with exactness, as one brand of paper may act differently from another in this respect, but one can scarcely go wrong by exposing for fifteen minutes, increasing, if necessary, to twenty minutes.

It is of vital importance that the sensitive paper shall be *thoroughly dry* when placed in the fuming box. Inattention to this will result in failure in obtaining equality in the tone of the print. The sensitiveness of the paper is considerably

increased by fuming, hence less time in the printing is required.

Fumed paper prints to a deep rich purple tone, and those who have retained statistics say that less gold suffices to impart the final tone than is required when unfumed paper is used.

It is not considered advisable to transfer the paper from the fuming box direct to the printing frame, but to keep it exposed to the air for one or two minutes, in order that such ammoniacal vapour as may hang about the paper may be dissipated somewhat.

Several years since, a method of fuming paper, of which we spoke very highly at the time and still employ occasionally, was given by, we think, Dr. Hermann Vogel. The paper was sensitised by carbonate of silver instead of by chloride. Now, paper so prepared will keep white and good for a long time, but it is lacking in sensitiveness. This quality can, however, be easily imparted to it by charging a piece of felt with the vapour of ammonia and placing this behind the paper when laying it with the negative in the printing frame.

What we believe to be a decided improvement upon this was afterwards introduced. Let the ordinary albumenised paper be sensitised upon a strong silver bath as usual, and then transfer the sheet to a bath of distilled water and be floated on this for about a minute or so, by which a large portion of the free nitrate is removed. This paper will keep good for a considerable time, several weeks at any rate. When it is used, let the fumed pad be laid upon it, and the printing will not only proceed as quickly as if the free nitrate was still upon it, but will print so vigorously that the blacks will be bronzed.

The knowledge of this may prove useful to those who during this dull weather require all their time in getting off prints from dense negatives. The ammonia fumes in this case act in a manner strictly analogous to the presence of a large amount of nitrate of silver left on the paper, added to which is the fact of the paper keeping good for a considerable period.

We have spoken of ready-sensitised paper refusing to tone. This fault was very prevalent a few years since. On the supposition that it arose from a too great excess of the vegetable acid (citric or tartaric) used as a preservative of the paper, some of it was well washed before toning, alkaline water being employed, but without such a good effect having been produced as was obtained by a pad strongly impregnated with ammonia having been at the back of the paper during the exposure.

REPEATED DEVELOPMENT WITH THE SAME SOLUTION.

Little though it might perhaps have been credited a few years back, it is now a fact acknowledged by many that good and uniform work may be done by using the same developer over and over again, simply reinforcing it with fresh solution as its powers become feebler. In the constant and regular practice of a large establishment this is even easier than when the work is on a smaller scale and executed at intervals, although, under the latter circumstances, it is by no means unusual to find the practice followed of bottling off the used developer, to be re-employed either alone or mixed with a certain proportion of fresh.

This altered state of affairs is due to a variety of causes, among which may be noted as the principal the greater keeping powers of the more modern developers as compared with pyro, and the general substitution of the fixed alkali for ammonia. With regard to the former, although pyro in stock solution, if properly preserved with sodium sulphite or other suitable agent, will keep as long and as well as any of its newer rivals, such is not the case when it is diluted for use and freely exposed to the atmosphere in the process of development. Under such circumstances it very rapidly discolours, and deposits a muddy sediment; and, though it may not altogether lose its developing power, it soon becomes practically useless on account of its strong tendency to stain the film.

The volatile character of ammonia in any form is another of the causes that helped to make successive development a practical impossibility in earlier times, for, although it is now recognised that the actual quantity of alkali present in the developer has less result on the final character of the negative than was formerly supposed, still the uncertainty caused by the rapid escape of ammonia vapour during development rendered it quite impossible by any means to preserve even the similitude of uniformity. When it is remembered also that ammonia possesses the unfortunate property, if used in excess, of developing "green fog" and other evils, it is obvious that the greatest care was necessary in its too free use in keeping up the energy of the solution.

Another alleged cause that has been put forward is the greater effect that restraining bromide is supposed to have over pyro development than over other of the more modern methods, although in this we are not altogether prepared to agree. It must be remembered that, in the case of development with pyro and ammonia, we have in addition to the natural weakening of the developer from use—that is to say, from oxidation of the pyro itself—two other influences proceeding simultaneously, namely, the diminution of its energy through escape of ammonia and increased restraint from the bromide given off in the process of development from the reduced metal in the sensitive film. Although it is possible that the restraining effect of soluble bromide may in the case of pyro, other things being equal, be slightly greater, proportionately, than with amidol, metol, glycin, para-amidophenol and the like, still it is, we think, not sufficiently so to be worth taking into account, the true explanation being that we have given an increase of restraining power acting in conjunction with a gradually weakening developer.

Now, in the case of hydroquinone, there can be no doubt of the proportionately more powerful effect of free bromide, more especially when the alkaline carbonates are used, for not only is the effect of added bromide in the case of fresh and unused solutions much more marked than with other developers, but the additional bromide derived from each successive plate developed so alters the character of its action that uniformity is quite out of the question if repeated development be practised with this agent.

Let us return to the question of repeated development with the same solution in practice. In many large establishments that we are acquainted with this system has been adopted, and is regularly worked with the most perfect success; indeed, we have heard it claimed by one operator that he obtains absolutely more uniform results in this manner than by the older system of freshly mixed solutions for each development. The system, moreover, is one that is pre-eminently suited for use on a large scale, for, if a considerable bulk of developer be mixed at once, it is less liable to change in use than a smaller quantity. If we add to this the fact that the action of the

developer may be so regulated as to be under complete control of the operator, it will be seen that the worker on a large scale possesses a power that was quite unknown a few years ago, and, in fact, development has now become an almost automatic operation.

So at least it would appear as we have seen it worked in one large establishment, and probably the details of the system there adopted may be interesting. When we last witnessed the process, a large dish, about 16 by 14 inches, containing six half-plate negatives, was resting upon one of the ordinary rocking tables. The developer was made up in quantities, we were informed, of 40 ounces in the state for use, and of this a liberal quantity was poured into the dish at once, about, we should judge, one-half. When development once started, it became a continuous operation throughout the day, or as long as there were negatives to develop; six plates are put on to start with, and the images watched as they appear, and when finished each negative is taken out individually and its place filled up with another plate. As the action of the solution becomes slower, or the experienced eye of the operator tells him it wants strengthening, the remaining bulk of mixed developer is poured into the dish, allowed to mix by rocking for a short time, and then a portion of it poured back into the developing jug, to serve for the next strengthening operation. This reserve quantity is reinforced from the stock solution and mixed with the remainder in the dish when again required, and by thus making small but frequent additions as required negatives are turned out in a regular and continuous manner of perfect uniformity.

It is not, however, in every establishment that such a system could be advantageously worked, though, wherever any quantity of work is done regularly, the practice of using the same solution over again may be adopted with every advantage. Of course, in the case of an amateur, who only exposes a plate or two at wide intervals, there is nothing to be gained, but rather the reverse, for it will be in every way better to mix up a fresh quantity as required for use; but those who are at work with tolerable regularity, without wide intervals of rest, will certainly find it to their interest to practise this system, if only as a matter of economy, although, beyond that, from our own experience, we are inclined to think there is an advantage derived in quality and uniformity of result when the system has been got into full working order.

In our own practice we keep a bottle of used developer, and for all ordinary subjects we commence development with this, and, if the exposure has been correct, we generally find that the stock bottle suffices. If, however, the exposure should prove to have been short, or if the development should be slow from any other cause, a little more of the concentrated solution is added, and in this manner, and by always carefully watching the behaviour of the developer, it is kept without much difficulty in an almost uniform state for use.

Of course, for special purposes, we should not think of trusting to such a mixture. We are speaking up to now of ordinary class subjects with normal exposures and normal conditions generally. For instantaneous exposures or difficult subjects, we should, of course, mix up fresh developer, which, after use, would go into the stock bottle of used solution. If, on the other hand, from over-exposure, we have to add bromide, then after use that portion of the solution would pass down the sink.

We had intended saying a word or two on the behaviour of the different developing agents now in vogue when applied under the above system, but must reserve this for another occasion.

The "Rejected" Exhibition Abandoned.—The Committee of the Central Photographic Club announce that, owing to insufficient response having been made to the invitation to send in pictures for the Rejected Exhibition, they do not feel justified in holding the same, and have therefore decided to let the matter drop.

Art and the Lantern.—Now that the lantern season is fully on, it may be well to direct attention—not for the first time, however—to the fact that art is little, if at all, represented in the lantern. By art, in this instance, we allude to the works of great masters, as shown in our own and the numerous Continental national collections, with which some foreign houses have made us so familiar in all forms except slides for the lantern. Slides of the *chefs-d'œuvre* in the foreign galleries, and in those of our own, would be not only instructive, but equally as interesting, in most lantern shows, provided, of course, they were of the same excellence as the reproductions which have made some Continental houses so famous.

The Royal Photographic Society.—We were pleased to notice that at the meeting of the Royal Photographic Society on Tuesday last the nomination papers of between fifty and sixty candidates for election as members were read, several of these being professional photographers. As an instrument for elevating the status of photography in every respect, the hands of the Society would be vastly strengthened by a large accession of new members, and we urge our professional friends who are not members to follow the lead set them by some of their *confrères*, in seeking admission to the Society, and thus help make it not merely a medium for the diffusion of information, but also a thoroughly representative, authoritative, and teaching body. Mr. W. S. Bird's remarks on the subject in another part of the JOURNAL are much to the point.

Fugitive Spotting and Stable Prints.—On several occasions of late we have seen in specimen cases at railway stations and other exposed situations prints considerably marred by the spotting or "finishing." We are referring to platinotypes more particularly. The colour, no doubt, matched that of the print when it was put on, but the action of light has discharged the warmer constituent of it, probably a cochineal lake, and left only the black, which is, of course, quite of a different tint from that of the picture, and is therefore painfully conspicuous. We have before animadverted on this subject with reference to carbon pictures that have been exposed continuously to strong light. The pictures were unchanged, but the colour employed for working them up had changed badly. It is a pity that permanent prints should be spoilt by unstable spotting.

The Salon Conferences.—On Wednesday evening, October 3, the first of the Salon Conferences was held at the Dudley Gallery, when Mr. H. P. Robinson gave a paper entitled *Our Aims and Ends*. This, which appears in another part of the JOURNAL, is a sprightly Robinsonian apology for the Salon and the Linked Ring. The gist of it is, that all is fish that comes to the net of the Salon in the way of artistic expression in photography. The paper is well worthy of perusal, if only on acconnt of the fact that we get for the first time a clear exposition of the Aims and Ends of the Salon. On the occasion in question Mr. George Davison was in the chair, and there was a good attendance, Rev. F. C. Lambert, Mr. Horsley Hinton, Mr. Francis Cobb, the Chairman, and others, taking part in the discussion.

Sale of Poisons.—We have frequently had occasion to comment on the action of the Pharmaceutical Society with reference to their proceedings against dealers in photographic material when they have sold small quantities of such things as cyanide of potassium, bichloride of mercury, &c. A recent inquest, in a case of suicide, brought to light its strange action, or rather inaction, with regard to

the unrestricted sale of a poison which the learned coroner said caused more deaths by accident, misadventure, or suicide, than anything else, namely, carbolic acid. The Pharmaceutical Society is supposed to look after such matters as this, for they have the power, with the approval of the Privy Council, to regulate the sale of poisons. Yet here is a poison—that is probably the cause of more deaths in a single year than the whole that have occurred since the introduction of photography from the sale of restricted materials used in the art—which is sold at every oil shop without let or hindrance, indeed is sometimes even given away in times of epidemic by the local sanitary authorities. If a photographic dealer, unless he be a pharmaceutical chemist, sells a small quantity of, say, cyanide of potassium, and it comes to the knowledge of the Society, he is "blackmailed" under a threat of proceedings under the Poisons Act. What an anomaly!

The Latest Coupon Trick.—The latest dodge, or at least the latest that has come before us, deserves to be brought prominently under notice, so that the public may be on their guard. It appears that some houses issue books of so-called "coupons" that entitle the holders of them to have their portraits taken at a reduced charge. These books are issued, so we are told, to any one applying for them. These coupons are hawked about the suburbs and sold for small sums, but the largest, of course, obtainable. If the distance to the studio is demurred to, the canvasser is equal to the occasion, and says that, by a further small payment, the portrait will be taken by some well-known and reputable photographer in the immediate neighbourhood. On this assertion a coupon is often purchased, with the result that, when it is presented, the would-be sitter finds that he or she has been victimised, and the photographer is very naturally indignant that his name has been used in connexion with the fraud. By this system, not only are those who purchase the "coupons" defrauded of their money, but, what is worse, the reputation of the local photographer suffers in the eyes of those who do not from the fact of the statement that he works on the so-called coupon system, and has two or more prices for the same thing. It is a pity these men are not charged with obtaining money under false pretences. Where is Scotland Yard? Perhaps this system of fraud has not been brought before it.

Photogravure at Home and Abroad.—*Apropos* of the article last week on *Commercial Photographic Progress at Home and Abroad*, a correspondent, who evidently takes a pessimistic view of English commercial progress, says we made no mention of "the important process, photogravure, and how much better that class of work is done on the Continent than it is in England." This, he further adds, "is, no doubt, due to the better translating of the colours of the pictures into monochrome than is done by English photo-engravers, and for that reason artists and publishers send thousands of pounds' worth of work to the Continent for execution, as print-sellers' windows prove." There is much in what our correspondent says that is perfectly correct, for it is a regrettable fact that commercially we are not in the van in this particular branch of the art. It is quite true also that a very large majority of the best reproductions of English pictures by photogravure are made abroad, and with great perfection. However, a greater interest than hitherto is now being taken in this process, particularly by amateurs, and their work may further stimulate professionals in their efforts. One thing is quite certain, that there is no reason why as good photogravure should not be done in England as anywhere else. When publishers are convinced that it can be, they will assuredly prefer having the work executed here, rather than, as now, incur the risk and expense of sending valuable paintings hundreds of miles by land and sea for their reproduction.

VIGNETTING.

III.

I MAY conclude my description of the method of making vignette glasses by a brief reference to the various processes that are available for the purpose, pointing out their advantages and failings from a practical point of view. I may preface my remarks by stating that, whatever the process on the film employed, it will be found a very much more difficult task to obtain a *perfect* result in the case of a graduated vignetter that an ordinary transparency or negative image, for the simple reason that every minute defect that might pass unnoticed in an ordinary picture will show out prominently in the otherwise unbroken sameness of the graduated screen. For this reason it must be understood that only the most perfect film can be employed with any hope of success.

In a previous article I referred to my want of success in the use of gelatino-bromide plates; this does not arise from any failure in quality in the plates themselves, but purely from the inability of any known developer to give the range of gradation that is necessary—at least, on plates of the ordinary thickness of coating. It is possible, nay, probable, that with films of double or treble the thickness of those in general vogue the needful gradation might be obtainable, but, until such become an article of commerce, the operator will have to trust to his own resources in their manufacture if he is desirous of trying that method. Later on, I shall have something more to say on this point.

I have already spoken also of the use of albumen paper as the medium for use, and, if the slowness in printing that such vignettes involve be not an objection, nothing is easier to work nor gives better results with the minimum of trouble; but the paper must be of good quality, and preferably specially prepared. The ready-sensitised papers, although they can be made to answer the purpose, do not, as a rule, give the best results; if such be employed, greater density of image, combined with gradation, will be secured by printing through the paper, that is to say, on the back of it, by which means the deposit of silver is formed *in*, rather than *on, the surface* of the paper.

But, if this mode of working be adopted, the preferable plan will be for the operator to sensitise the paper for himself, and to depart in great measure from the principles that rule the working of albumen paper for ordinary purposes. Thus, instead of curtailing the period of sensition as much as possible, to keep the image on the surface, it is advisable to considerably prolong it, so as not only to allow the silver solution to act fully on the soluble chlorides, but also to let it sink well into the fibres of the paper, and thus produce a vigorous and not merely superficial deposit or image. Equally good, or perhaps better, is to float the reverse side of the sheet, in which case the sensitising solution is bound to act throughout the whole thickness, and, in doing so, to draw some of the soluble chloride into the body of the paper, and there convert it into silver chloride. Paper prepared in this manner, even though lightly salted, will give a rich dense image, full of gradation by transmitted light, although of no practical use for ordinary purposes. It may be printed from either side, though preferably, I think, from the non-albumenised.

If printed deeply enough, there is no need of toning if albumen paper is used, the brownish yellow colour of the untoned silver deposit being very non-actinic; but with a lighter image a partial toning with gold or platinum prevents its being taken down too much in the fixing. As a matter of course, in order to avoid retarding the printing of the positive to too great an extent, the vignetting mask should be waxed or otherwise rendered translucent. Waxing is the quickest and easiest, but it requires frequent repeating to keep up the transparency; oiling is objectionable on account of the time required in drying; and Canada balsam, unless of the best quality, also has the disadvantage that it very soon turns yellow. Vaseline or vaseline oil forms perhaps the best agent for the purpose.

The next method, I may mention, is collodio-chloride, or printing-out collodion emulsion. This involves the preparation of the emulsion—but that is not a very difficult matter—for, so far as I am aware, there is no such emulsion on the market at the present time, and the ready-coated papers are of no use on account of the thickness and unevenness of the paper basis. Besides this, the film that is best adapted for positives is not calculated to give the best results when employed for negative purposes as in the case of a vignetting screen. In making the emulsion one or two points need to be observed that

are not of prime importance when it is required only for ordinary purposes. It must not contain too large a proportion of crystallisable matter, especially of a hygroscopic nature, in other words, the free nitrate of silver and the citric acid or citrates must be kept down as far as possible, or, owing to the fact that the emulsion has to be spread upon glass, they will crystallise at the surface, whereas, if spread on paper, they would be in a great measure absorbed. The emulsion too should contain as little as possible free acid, which, even with the most textureless collodion, always has a tendency to produce crapiness and mottling, which, of all things, are fatal to the production of a satisfactory vignette.

So far, however, as density and gradation are concerned, collodio-chloride, if carefully managed, gives results that can scarcely be surpassed by any method. If the conditions are such that there is no mottling or unevenness in the emulsion itself, then irregularities from crystallisation or other causes may be avoided or mitigated in a variety of ways. First, it may be spread upon gelatinised paper instead of glass, when the soluble or crystalline matter will be absorbed into the support, and, after exposure and fixing, the collodion film can be easily transferred to glass. Or, it may be coated upon glass, and exposed while still moist, a cover-glass, separated by strips of card at the edges, being placed over the film during exposure, to prevent evaporation and to keep it from drying, in which case all trouble from crystallisation is prevented.

Gelatino-chloride printing-out plates and emulsion form another very effective method of securing the desired results. When the prepared plates are obtainable they are certainly the most convenient, but the preparation of the emulsion for this purpose is a very easy matter, as the colour of the final image is not of the slightest importance if only sufficient density is obtained. The same remarks are, however, applicable as to the collodion emulsion; it must not contain too much crystallisable matter for exactly the same reasons. Although the gelatino-chloride plate may be exposed in the moist state, as already described, it is scarcely possible to utilise the alternative method of transferring from paper.

Perhaps the best of all methods, not only as regards quality of result, but also convenience, is the carbon process; at least, it is the one by which I have been able to obtain both the finest gradation and the greatest freedom from minute flaws and defects, one of which serves to spoil an otherwise perfect vignette. Indeed, even with the finest tissue obtainable, such as would give "immaculate" results for ordinary pictorial purposes, it requires the most strenuous precautions and the utmost care to avoid little defects that would pass absolutely unnoticed in an ordinary picture.

The tissue should be as newly sensitised as possible in order that the development may be easily performed, and without recourse to too high a temperature, the greatest uniformity of surface being secured by means of very gradual development at a temperature not exceeding 110°. If this be greatly exceeded, there is always a risk of unevenness or washing away in the more delicate parts of the gradation, an unevenness that, though palpable enough in a vignette glass, would be quite inappreciable in an ordinary positive image.

Before placing the tissue in the printing frame, it should be carefully and somewhat vigorously rubbed with a dry cloth or a soft clothes-brush, in order to remove any particles of dust or foreign matter that may be attached to the surface. It is needless to say, also, that similar care should be taken to ensure that the front glass of the printing frame is free from any specks of dirt or dust any of which will leave its mark on the resulting vignette. Similarly, in mounting the exposed tissue for development, it is necessary to take care that the water is free from floating particles that may be imprisoned between the tissue and its glass support. This is far from being a work of supererogation when the water is drawn from "the main," but when, as in my own case, it is pumped direct from the well, it is absolutely necessary to filter it before using it for any purpose such as this.

Another simple precaution will greatly assist in the securing of perfect results; that is, to invariably squeegee over a sheet of indiarubber cloth, and not, as is very frequently done, directly on to the back of the tissue. If the latter practice be followed, portions of the paper are abraded, and these, in the course of development, settle on the soft carbon or gelatine film, and either abrade it or become lodged there, in either case giving rise to faults that may probably entirely spoil the result. If, from want of rubber cloth, it is absolutely necessary to use the squeegee directly on the paper, then, before development, pour a quantity of cold water, either from a jug or from the tap, on to the back of the tissue, to remove any loose or detached particles before transferring it to the developing tank. These and similar little precautions must be looked to if perfection is desired.

I have tried several different kinds and colours of tissue, including "transparency," which might naturally be supposed to be the most suitable for this purpose, though this is not my experience. The colour does not seem to be material, but greater thickness or proportion of gelatine in the ordinary tissues, and their greater transparency, allow the light to penetrate deeper, and so aid in giving a vigorous printing image. The greater thickness of gelatine, too, lends itself to further intensification with permanganate of potash or other agents; in fact, on all accounts, I greatly prefer the ordinary tissues. The particular colours I have used are the "standard brown" and "sepia" of the Autotype Company, which, after intensification, give a rich, vigorous, and transparent image of a deep orange-brown colour, and very non-actinic.

Reverting to the use of gelatino-bromide or chloride of silver emulsions, these, as I have said, are practically useless in the ordinary way; but, if made with a soluble gelatine, such as Nelson's No. 1, and with the addition of a few grains of bichromate of potash to each ounce, they make practically autotype films, with silver as the pigment, and may be treated as such. The soft gradation is then obtained in the same way as with autotype or carbon tissue, and the density can be secured by subsequent development to any desired extent.

The simplest way of forming such an emulsion is to incorporate washed carbonate of silver with a thirty or forty-grain solution of gelatine, and to add four or five grains of bichromate of potash to the mixture, which will assume a deep red colour. Now drop in, a few drops at a time, a solution of bromide of potassium, until, after shaking, the colour is reduced to a pale salmon, when, after filtration, the emulsion is ready for use, and may be spread either upon glass or paper. If coated upon glass, the exposure must be made through the glass, and this forms the easiest way of working, as it completely obviates all necessity for transferring, as in the ordinary process.

W. B. Bolton.

JOTTINGS.

Success, as regards their qualitative character, is, by common consent, the pleasant experience of both the Exhibitions recently opened —the Royal and the Salon. Naturally my principal sympathies are with the first-named, and I sincerely trust that success in a financial sense will also attend it. The Society's opportunities of usefulness are sorely prescribed for want of the wherewithal, so that, if the Exhibition actually shows a handsome profit, I am convinced that photography in general, and not merely the members of the Society, would derive great benefit. Adverting to the Exhibition as such, it is, of course, characterised by the now inevitable blunders as regards some of the awards; but that, as Mr. Toole, in *Walker, London*, says, is "nothing." We always look for indications of judicial aberrations; and we generally get them. If the Judges had stopped here, nobody would have had any right to complain; but unfortunately they did not. They "mentioned" several pictures. Now, according to the traditions of judging at the Society's Exhibition, an exhibit is either worth a medal or it is not, and it is on this understanding that people hitherto have sent in pictures for competition. In departing from this rule, or tradition, the Judges have possibly not only exceeded their own powers, but have, in a sense, placed the Society in the position of having broken faith with its supporters, who, up till this year, were sure of having their pictures judged from a standpoint which admitted of the official expression of no two opinions. I hope this innovation will not be perpetuated. "Mention," either honourable or not, is at best but a dubious honour, and, at Pall Mall

in particular, is likely to give rise to no end of discontent and heart-burning, besides injuring the Society by deterring good men from exhibiting.

As to the Salon, I wish it just what its promoters wish it, no more, no less. I think that, if the authorities had rejected all the fantastic smudges that are hung this year, I would have even taken the Salon to my heart and blessed it. Some time back I was talking to one of the leading supporters of the Piccadilly enterprise who seceded from the Society at the period of the famous squabble in which a policeman bore a part, and I expressed a hope that he might again figure as an exhibitor at Pall Mall. "Not," he replied, "until the purely pictorial works are hung in a room by themselves; and the scientific, architectural, and non-pictorial exhibits elsewhere." From his point of view his condition is a reasonable one; but something of the same degree of objection holds good with regard to the Salon itself. We should all be delighted with it if the admittedly and obviously pictorial attempts it contains were kept by themselves and the Others, which are neither pictures nor photographs, were hung amid suitable environments, that is, in the impenetrable gloom and murkiness of the basement or the coal cellar; for, to paraphrase a remark made by the author of the immortal paper on *Spirit Photography* in reference to another series of photographic productions, "pictorially they are vile: so how came they hung?" But there—if the Salon had not something wildly grotesque and extravagant to show us year by year, its days would be numbered. And I rather suspect the promoters to be animated by this shrewd idea.

What a marked difference in power a slight fall in the temperature imparts to some developing solutions. I was recently using a solution of sodium sulphite and amidol for developing some bromide prints, the temperature of the developer, which I took at the time, being 58° Fahr. Upon attempting to use the same solution a couple of days later for the same kind of work, negatives, exposures, and paper being identical, the weakness and slowness of the developer were such as for the moment to persuade me that I had exhausted its strength in the original trial. Reflection showed me, however, that as I had only developed three prints this could not be the case. Bethinking me of a change of temperature, I applied the thermometer to the solution, and found it register 52°. Warmed up to 58°, it worked as well as ever. The hint may be useful to many amateurs who, at this season of the year particularly, neglect to keep their solutions up to proper temperature.

While I am on the subject of development, here is another hint, that may be serviceably given to those casual workers who now and then experience that description of dark-room fright consequent upon unexpected cases of over-exposure: Keep a bromide bath handy. Most of us, I fancy, employ our developers at normal strength, instead of starting tentatively; but in either case it is seldom that we escape occasional cases of over-exposure which require instant correction. The usual plan is to increase the bromide; some recommend the immersion of the plate in plain water. I have never found the latter method wholly satisfactory, a continuating action appearing to me to go on. A dish containing a plentiful quantity of bromide solution, say, 2:100, will be found a handy adjunct to the *impedimenta* of the developing sink. The over-exposed plate may be at once slipped in it and development arrested while the developing solution is modified to meet the case. A friend, a very old worker, mentioned the idea to me the other day, and I give it place here for the benefit of those who may not have thought of it.

I am informed that the Central Photographic Club is in a parlous state. During twelve short months the *personnel* of the executive has undergone a complete transformation, the officers displacing and replacing each other with bewildering rapidity. The hopes and dreams of the promoters do not appear to have been realised, as, instead of the Club turning out a kind of Camera Club at a small subscription, it simply became another talkee-talkee photographic society plus a couple of occasionally opened dismal rooms, in which such seductive pursuits as smoking and "beggar your neighbour" could be furtively indulged in. The attempt to fuse professionals, amateurs, manufacturers, dealers, nondescripts, and others into a homogeneous clubbable body has not resulted in a conspicuous success, and rows, recriminations and resignations, says my correspondent, have recently shed their lambent illumination on the pathway of the Club's career. If ridicule could really kill, the promoters would do well to order their coffins.

Nevertheless, I gather that there are several hopeful spirits in the moribund Club who are determined to make another bold bid for success, notwithstanding the dismal experiences of the last year. In the first place, I am told it has been decided to impart a more pronounced social leaven to the life of the Club than in the past. This possibly means that tea and crumpets, musical at-homes, concerts, receptions, and other sweet but harmless dissipations will be allowed. Also I hear that the Club intends withdrawing from the Satanic atmosphere which necessarily abides in licensed premises, and ensconcing itself amid the pure and elevating surroundings of a coffee palace. Ah! why did not the Club take that virtuous and inspiriting course at the first go-off? We should have flocked to it in our thousands. Then, the Club intends admitting ladies. How nice! If there is one thing more than another which would attract me to a photographic club, it would be the society of the "New Woman." On the whole, the prospects of the Club are as good as —ever.

Mr. W. R. Kennan, of Dublin, who, in the JOURNAL for September 28, attempted to give a synopsis of Dr. Joly's system of colour photography, has, I fear, not sufficiently acquainted himself with the details of the information he intended to convey to us. With the exception of making the exposure through finely ruled colour screens, the process, so far as I can make out from Mr. Kennan's meagre description, does not differ essentially from that of Mr. Frederick Ives. By the way, Mr. Kennan speaks of a *photogravure* screen, and the lynx-eyed editor of one of your contemporaries, who cultivates the dangerous practice of pouncing on other people's slips while existing in blissful ignorance of his own, says he would "like to know what screen is used in photogravure." Well, I should have thought the editor of a photographic paper, of all men in the world, would know that *no* screen is used in photogravure; apparently, I am wrong. I can thoroughly understand, however, that a person who is not supposed to be acquainted with the niceties of photographic nomenclature would unhesitatingly use the term when referring to the screen used for half-tone etching work. And, after all, the main principles of intaglio and half-tone etching are so far parallel that the term "photogravure" might, I think, apply equally well to either, without any great violence being done.

Some kind person sends me, in the form of cuttings, a few of the remarks on men and manners which are contributed to a photographic periodical by one "Zoilus." My correspondent scores the cuttings with the homely but expressive word, "Butter." The main object of these paragraphs, which betray all the pointless inconsequentialities of the new journalism with none of its cleverness, appears to be to belaud, flatter, and glorify a few members of the Camera Club and the General Committee of the Salon. If many of these gentlemen do not feel very uncomfortable under this greasy layer I shall be surprised. But, besides playing the sorry *rôle* of courtier, the writer falls into the worse sin of telling tales out of school. It seems that he was present at a press view of a photographic Exhibition, and this gives him the opportunity of indulging in some ill-natured and uncharitable remarks at the expense of those journalists who actually partook of the creature comforts provided for them! This, he says, "is about all some of the press go for." I don't want to be harsh in my judgments, but it seems to me that the writer might be better employed than in taking stock of the movements of his *confrères*. Is this "all that *he* went for?"

COSMOS.

OUR AIMS AND END.

[Read at the Photographic Salon, October 3, 1894.]

In a recent letter to a society at which he was invited to lecture, Mr. Holman Hunt wrote as follows:—

"Doctrinaires go about laying down dogmas—for instance, that all work should have moral teaching, or that it should have none; that everything should be minutely finished, or that it should be done as much as possible without exact elaboration; and that everything should be idealised, or that nothing should be more than real, or different than the accidental fact. This is but a brief enumeration of the laws laid down by theorists, who are all wrong in making hard-and-fast rules. You will have heard of the different fashions of the day, and you will have seen some of the productions of the new schools. My advice is not to be taken in by any declaration that such a work is in the 'correct style.' If a work does not, on sober examination, give you the conviction that nature in that phase is sweeter or nobler than you thought before, it is not good for you."

I quote this, as it happens to state a good deal of the creed of the Salon. We claim for ourselves, and welcome in others, lawful liberty of expression, and we do not even object to a little licence in a good cause, the cause or end being, through the intervention of art as it is in photography, to "give you," as Mr. Hunt says, "the conviction that nature in that phase is sweeter or nobler than you thought before;" "that phase" being the Salon phase, and that ours is an attempt to make photographs represent nature "sweeter and nobler" than they have hitherto done. Our aim is pictorial effect, and the rigid purism that will allow of only scientific results in photography is thrown to the winds. We don't care for facts, but we revere truth, and think with Browning's painter-monk, that

> "If you get simple beauty and naught else,
> You get about the best thing God invents."

Our pictures must be characteristic of the artist, to such an extent that those used to the study of photographs shall be able to see the hand of the master in his work. This is not quite accomplished yet, but there are already photographers whose works cannot be mistaken. As the picture-dealers say, they are "signed all over." The camera of the photographer must be no more in evidence than the brush of the painter; there is no everlasting talk among us of the tools and processes by the aid of which our pictures are produced; a happy thought that can be reproduced by our simple means is more to us than the most profoundly scientific method of *not* doing it; a beautiful effect we hold in greater estimation than minute detail. But no one of our exhibitors is asked to follow any particular method. We have been called a one-ideaed school of the fuzzy-type order. Our one ideal is perfection of pictorial photography. So far from being a servile school of one method, there never before was, perhaps, a body of men of such diversity of means and opinions united so harmoniously for one end.

We differ in other ways than in methods of picture-making, without much mischief being done. We differ in our ideas of the respect due to our art. Some of us think that its results should not be mixed up with its materials, while others contribute some of their work to mixed exhibitions; but we remember that we are all human, and that the epidemic of pot-hunting still rages. We all claim perfect liberty, but differ in matters of taste.

We have no little Dr. Johnson among us to dictate his own views, and not leave a word to be said by others. We hold all sorts of opinions. We are a linked ring, with no two links alike; and, if I may presume to use the word "link" in its other sense, each link contributes to one general illumination,—

> "Not all alike, but all alike informed
> With glorious light."

We have an old stager among us who still thinks there is some sense in those principles of art that have aided artists of all time; we have another (not yet an old stager), who has the utmost contempt for such guidance; we have one who frankly calls the method of another criminal; one whose pictures have jog-trotted along at the highest level of exasperating perfection of its kind for many years, partly because without the due balances and checks of imperfection; another who prefers distortion rather than not be original; one who rather thinks the lens and camera superfluous; another who feels naked and ashamed if he has not a battery of objectives with him; one who can manufacture a pictorial, or perhaps it should be called a process, joke by our truthful art, even to the extent of deceiving a Royal Society; another whose solid facts are as delightful as a dream; and yet another who seems inclined to add the advantages of unphotographic methods to our practice; while I myself prefer, at least for the present, to confine my attention to means only which may be truly called painting by light.

But why go on? I merely want to show you our toleration and infinite variety. Although we are a united body, we have flexibility and range, diverse tastes, many methods, but only one ultimate aim. We are not a one-groove society. We have many grooves running in parallel lines, and the only result of a collision, however violent, is a hand-shake—we never get broken bones. We are no readers of learned papers on useless modifications of processes that want no modifications; we have no theories, except how to get the best effects out of the materials supplied to us by the makers. In a word, we begin where the pseudo-scientific photographer leaves off. We no longer care for the science, but devote ourselves to the art of photography. These are our aims; our end has not yet come, and is, I believe, afar off.

To show how much our institution was wanted, I quote this little extract from a recent number of a photographic paper:—"Considering the great strides that have been made *in the sciences* in this country, it is curious to note the backward state of photography as a picture-making art." It is not in the least curious; few who take to photography study art at all. When editors and teachers learn that exclusive devotion to science is the chief *cause* of want of success in picture-making, it may be possible that the art of photography will improve; at present, the photographer is taught and thinks that his education is finished when he has completely saturated and confused his mind with chemicals and optics. There is nothing essential to the simple manipulatory part of picture-making that an ordinarily intelligent person may not learn perfectly in a few months; yet many spend their lives over it, and get "no forrarder!"

We are very grateful, and acknowledge our debt, to those who have improved the means of the art for us, but—*we want to get on!* With the exception of the introduction of some printing papers, the little science necessary for picture-making has stood still for years, and we are satisfied with what we have got. I myself prefer the developer of fifteen years ago, and so do the great majority of practical men. Plates have been made still more sensitive; well, I am sorry for it. There is nothing essential that we now have that we did not possess in 1880, except, as I have said, some printing papers; yet we have suffered and endured a deluge worse than Noah's—of talk.

There were brave men before Agamemnon. There have been pioneers who have left their footsteps on the sands of pictorial photography, but I think it must be apparent that the Salon is setting a higher standard than has been found general hitherto. If I may so put it, the Salon has set up mental over mechanical photography, and the organizers are succeeding in their endeavour to encourage "only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution." If you should doubt, "look around."

Just another word and I have done. It may seem a startling statement to those who have not thought over the matter, but I believe we are the only society in the world that confines itself to pure photography unmingled with other matters. Other societies admit other subjects more or less allied to photography, such as the preparation of the materials; this is no more photography than the colour-grinder's craft is painting. Others go still further astray, and allow whoever will, so that he supplies the inevitable "paper" and matter for discussion, to introduce subjects from kindred sciences. All very well in their way, but which should not be read in the name of photography.

We want some clearer definitions; our nomenclature is getting muddled. As I understand the word, and as it was defined by Captain Abney at the last conference of the Camera Club, the word "photography" means *painting by light;* the word "photograph," *a picture produced by the agency of light;* and I have lately seen the dreadful word "photogram" defined as "*one of the rejected.*"

The justification for the existence of any new movement may be looked for in the good it accomplishes, and I am bound to say in conclusion that, even if we do no more, we are proud of what we have done. We have shown that in a pot-hunting and commercial age it is possible to hold an exhibition of pure photography without the help of medals or admixture of extraneous matter. We have shown that there is more in the art than mechanical photographers have dreamed of; we have given hints that have been taken by other institutions which have followed our lead as nearly as their means and deference to the prejudices of years would allow, and I have little doubt that the time is coming when, through the movement we have initiated, the opposite poles of our great subject, the science of it and the art, will be completely separated, to their mutual benefit, and peace will reign—which is after all, perhaps, a pity, if it be indeed true, that through strife we reach perfection. H. P. Robinson.

CONTINENTAL NOTES AND NEWS.

Argentotype: Dr. Mallman's Process.—This printing process is described in a recent number of the *Rundschau*. The following solutions are first of all prepared:—

A.

Distilled water	100 c.c.
Ferric oxalate	20 grammes.

B.

Distilled water	100 c.c.
Silver nitrate	16 grammes.

For use, the proportions are:—

Solution A	8 c.c.
Solution B	2 c.c.

Suitable paper is coated with this mixture by artificial light, and the paper is rapidly dried by heat in order that the solution may not sink too deeply into the surface. Either starch or dextrine may be added to the mixture. Exposed under a negative in the usual way, a reddish image on a yellow ground is obtained. Here is the developer recommended:—

A.

Distilled water	1000 c.c.
Potassic oxalate	160 grammes.

The oxalate should be feebly acidified with oxalic acid solution.

B.

Distilled water	100 c.c.
Potassium bichromate	4 grammes.

C.—Concentrated nitric acid.

For use take:—

A	100 c.c.
B	12 drops.
C	4 „

The bichromate keeps the whites clear: for weak negatives, it is desirable to increase the quantity of it; for strong negatives, to decrease it. Development takes place in the cold. The tones vary a great deal; usually subsequent gold toning is necessary. After development the prints are passed through two or three changes of water acidified with nitric acid. A combined toning and fixing bath is recommended. Under-exposed prints may be intensified by means of a mixture of acetic acid, pyro, and nitrate of silver; over-exposure is remedied by prolonged immersion in the wash water acidified with nitric acid.

A French "Photographic Salon."—The Second International Exhibition of Art photographs will be held in Paris, at the commencement of the ensuing year. Only such works will be admitted as present some artistic character, either in choice of subject or pictorial treatment. The Exhibition is, in fact, conducted on similar lines to that of the Photographic Salon. All particulars are obtainable of M. le Secrétaire du Photo-Club, 40 rue des Mathurins, Paris.

A Letter by Daguerre.—The *Bulletin de la Société Française de Photographie* for September 1 publishes a reproduction of a letter by Daguerre, dated Bry-sur-Marne, 5 Juillet, 1841. It is devoted to correcting some misstatements and errors made by a correspondent in reference to some details of the Daguerreotype process.

A Useful Photographic Dictionary.—Our elegant contemporary, the *Paris Photographie*, is publishing in its pages a dictionary of all the technical words and terms employed in photography. The synonyms are given in French, German, English, Italian, and Latin, although, perforce, the descriptions and explanations have to be rendered in French. When published in book form, such a dictionary should have vast uses.

Removing Printed Impressions from Undeveloped Plates.—It is a common blunder for beginners (and, we fear, sometimes older hands) to wrap their exposed plates in newspapers and similar printed matter, the consequence being an impression on the film. To remove such an impression before development, the *Rundschau* recommends the immersion of the plate in a two per cent. solution of acetic acid, followed, after washing in running water, by placing the plate in alcohol.

A Combined Toning and Fixing Bath without Gold.—A foreign contemporary suggests the following formula:—

Hypo	110 grammes.
Distilled water	500 c.c.

When completely dissolved, add—

Potash alum (powdered)	10 grammes.
Lead acetate	35 „

Well mix, and, after allowing to stand for five or six hours, filter. On coming out of this bath, in which the prints should be allowed to remain at least eight minutes, they should be well washed.

Warm Tones on Lantern Slides.—M. Hertzka, in the *Mittheilungen*, gives the following formula for a developer yielding warm tones on lantern slides:—

Water	250 c.c.
Potash carbonate	8 grammes.
Potash bromide	50 „

After about thirty seconds' immersion in this, and before the image appears, add to the developer about half the following solution:—

Water	375 grammes.
Soda sulphite	75 „
Pyro	14 „
Sulphurous acid	5 „

In mixing the two solutions beforehand, the results are less satisfactory. The tones obtained resemble those given by gold.

Toning Albumen Prints after Fixation.—The following formula is given in *La Photographie Française*:—

Ammonium sulphocyanide	300 grammes.
Chloride of gold	3 „
Hydrate of potash	3 „
Water	1000 „

The bath is said to give black tones.

To Remove the last Traces of Hypo.—From the source above named we take the following recipe:—

A.

Chloride of lime	20 grammes.
Water	100 c.c.

B.

Sulphate of zinc	100 grammes.
Water	100 c.c.

The two solutions are mixed and well agitated, and made up to a litre with water. For use, take one part of the mixture to from five to ten of water, and allow the print to remain therein for ten minutes.

MR. W. S. BIRD ON THE ROYAL PHOTOGRAPHIC SOCIETY.

We extract from *Autotype Notes* the following appreciative and suggestive remarks on the above subject by Mr. W. S. Bird:—

Photographers should, and will, heartily welcome the announcement that Her Majesty the Queen has granted the title of 'Royal' to this Society, which came into existence half a century ago, and has since watched over the growth and development of our fascinating art-science with consistent devotion. Long live the Royal Photographic Society of Great Britain!

Beyond the grant of the prefix 'Royal' to its title, the Society is on the point of becoming incorporate; receiving such powers and privileges thereby as are possessed by other Royal Societies and Corporations; select bodies of persons combining for a special object. At present, the acts of the Society are only the acts of its individual members; incorporate, the Society becomes a unity, acts as one person, possesses a common seal, is in a position to receive gifts and bequests, and to hold property for the advantage of its special interests. Further, the Society is fortunate in its acting President, Sir H. Trueman Wood, M.A., &c., who brings to its service a special experience, remarkable business ability, and a practical sense as to ways and means that do not always accompany Academic distinction.

The present situation, in fact, offers splendid opportunities for raising the status of the Society, increasing its revenue, its powers, and influence for good in all fields of photographic work and investigation, and at the same time will be able to confer on its members a certain prestige and a pleasant sense of recognised usefulness.

The rapid advancement of the Society from a position of comparative struggle to one of security and honourable importance should be now an easy task, requiring only the devotion of its present members and the enlistment of many new ones. It possesses a strong Council, who are, doubtless, already considering questions of finance, of increased usefulness and development, and whose proposals and suggestions will appear in due time.

The Incorporated Royal Photographic Society will have the power of creating Fellowships, and, as is customary on such occasions, all the members on its books will have the right to claim this distinction, and of putting F.R.P.S. after their names, subject, of course, to such reasonable conditions as may be imposed by the Council. Supposing the pecuniary obligation attaching to Fellowship be, for the first two or three years, limited to the payment of an annual guinea, it may be expected that all the life, and probably one-half of the ordinary members will elect to support the Society by accepting the distinction, and will do this much more for its interest than for any personal gratification. It cannot, I think, be questioned, but that such a proportion of members are entitled by merit to the honour, while the legal right extends to all.

For the first year or two there will probably be a comparatively easy standard for admission of new members to Fellowship. Photographers producing first-class work, writers of any distinction on photographic science or art, discoverers of new processes or of improvements in old ones, inventors of useful novelties in materials, in optical instruments, in apparatus, &c., on becoming members, would have claims for Fellowship.

Candidates for election to the Society must, according to the rules, be proposed by one member and seconded by another, and to either one or the other of these members the candidate must be personally known. This rule needs some modification, as, speaking from my own experience alone, I have repeatedly been unable to get a proposal for candidates who, from their letters and circumstances, appear markedly eligible, but were personally unknown to myself or any other member. What fees and conditions Fellowship may entail later on will depend on the progress of the Society. For the immediate present, admission to that honour will probably be moderately easy, and it must take time and effort for the Society to achieve the position of a teaching and examining body to which it aspires.

The moral I desire to impress upon the leading members of the profession is the necessity of their noting the importance to their status and interest of this new movement. Photographers have hitherto signally failed in all attempts at combination for mutual benefit, the reason for which non-success is not far to seek. But there must be, at this moment, upon a very moderate computation, 3000 educated and competent men, doing successful business, who would be advantaged individually and collectively, morally and commercially, by membership with the Royal Photographic Society, and still more by Fellowship. There is now an opportunity before them of elevating the status of the profession that it will be wisdom to embrace and obtainable with little trouble or expense.

The accession of only 1000 photographers of good standing and position in business to the Royal Photographic Society would enormously strengthen that body and, at the same time, reflect honour on themselves. The Royal Photographic Society cannot be influenced by commercial considerations, but is concerned with photography as a science and a practical art. Its exhibitions are held to stimulate and appreciate perfection of technique, whether it be shown in the perfect rendering of scientific detail, or manifested in portraiture and landscape, with artistic expressiveness. To such workers it cannot be doubted Fellowship will be open without difficulty, the Society will be strengthened, a stimulus given to artistic and eminent work, and skilled photographers will find the social recognition of their craft pleasantly improved. The present opportunity must not be neglected by the trade. It is *now* that 'tide in the affairs of men which, taken at the flood, leads on to fortune.' An addition of only 500 new members, many of them to become Fellows, would so add to existing revenue as to give the Society at once an enormously improved position.

DUNDEE PHOTOGRAPHIC ASSOCIATION: ANNUAL *CONVERSAZIONE.*

The Dundee and East of Scotland Photographic Association inaugurated their winter session with a successful *conversazione* held last week in the Victoria Art Galleries. The gathering was large, comprising about 300 ladies and gentlemen, among those present being Provost Orchar, the Rev. E. J. Gough, Professor Steggall, Professor Waymouth Reid, Mr. Andrew Stewart (President of the Association), Messrs. David Ireland, J. D. Cox, Vaness C. Baird (the Secretary), Charles Ower, A. C. Lamb, Baxter Gray, J. Addison Kidd, George Dott, R. W. Laburn, D. H. Littlejohn, William C. Norrie, W. H. Blyth Martin, T. M. Davidson, C. W. Scrimgeour, F. J. Hambly, J. R. Appleyard, Robert Murray, W. E. Boxer, John Jones, A. B. Crichton, &c. That the members of the Society are year by year improving in the excellence of their photographic work was evidenced by the specimens of their art hung on the walls of the large gallery. With few exceptions, these were of very high quality, many of them showing an artistic preparation and finish which would have done credit to the best photographic firms. An outstanding exhibit was a set of Japanese hand-coloured views, lent for the occasion by a gentleman just returned from the Far East. In one of the smaller galleries adjoining, there was displayed a very fine collection of autotype and collotype prints, lent for exhibition by leading English firms, and stands of photographic apparatus were shown by Mr. Peter Feathers and Mr. Lowden. The proceedings opened with tea, served at a buffet in a third gallery, after which the audience adjourned to the large gallery to enjoy a lengthy and interesting programme. The Chairman, in the course of his Presidential address, said it was only in the enthusiasm which he had for the art, and the faithfulness he had shown towards it as

A Recreative Hobby,

that he expected to be in any degree abreast of the most expert and active member of the Association. Twenty years ago he was making lantern slides by the wet-plate process, and he was pleased to think that fourteen years ago he was ahead of the times in certain adaptations of the photographic art, for he had then advocated the use of the magic lantern for the purposes for which it was now being employed by the Rev. Mr. Carlile in his Sunday-evening mission services in East London. He looked upon the production of a perfect lantern slide as perhaps the highest reach of the photographic art. Where was there to be seen a more pleasing and beautiful photographic object than a first-class slide displayed in a twelve-feet disc on a well-lighted screen? He held that the person who made a perfect slide was a benefactor to his race if he allowed that slide to fulfil its legitimate function, that of being exhibited. It was capable of giving pleasure to thousands at one time, and it might travel over the country on its educative and artistic mission, diffusing pleasure wherever it went. After humorously adverting to the advantages possessed by the small camera over the larger instrument, the Chairman said it gave him pleasure, which he was sure they all shared with him, to see the tokens of renewed vitality and interest exhibited by the Society at the commencement of a new session. This was the second *conversazione* they had held, and the intention of the Council in organizing them was to give the members an opportunity of meeting together in a social capacity, and so strengthening the bond that united them as fellow-members of the Association, and as fellow-students of the recreative art they sought to cultivate. In conclusion, he adverted to the splendid services rendered to the Society by Mr. Baird, the Secretary, who, he said, had been their

Faithful and Energetic Servant

for many years. At a later stage in the programme Mr. F. J. Hambly gave an illustrated lecturette upon *Negatives and Positives*. He dealt with the production of positives by one operation, without the intermediate making of a negative, illustrating this by reference to the ferro-prussiate and gallic-acid processes for producing positive and negative prints from engineer's tracings. He afterwards treated of the reversal of the photographic image by prolonged exposure to light. The paper was of an interesting character, and was illustrated throughout by experiments and lantern slides. Subsequently a short lecture was given by Mr. J. Murray Feathers upon *A Trip to Antwerp Exhibition*. The lecturer treated the subject in a racy and highly humorous style, and illustrated it by a capital series of instantaneous photographs thrown on the screen. The musical items on the programme were varied and enjoyable. Songs were given by Mrs. Mess, Mr. J. Addison Kidd, and Mr. R. Morrison, jun., whose rendering of "Anchored" was graphically illus-

trated by coloured lantern slides. Mr. J. H. Halley played a couple of pretty solos on the mandoline, and an orchestral party—consisting of Miss Stewart, Messrs. Feathers, Fleming, Grieve, Ireland, and Smith—gave delightful renderings of a gavotte by Boggetti and a waltz by Ostlere. The proceedings, which were throughout of a thoroughly enjoyable character, were brought to a close with votes of thanks.

News and Notes.

ERRATUM.—In our issue of last week, we are sorry we inadvertently omitted crediting the article by Mr. John Clarke, on "Backgrounds," to the *American Amateur Photographer*.

"PHOTOGRAPHS REGISTERED."—The address of Mr. George W. Crook, as given under this heading last week, is not "Eccles" as there printed, but Bury New-road, Whitefield, near Manchester.

THE PHOTOGRAPHIC EXHIBITION.—Lantern arrangements for the week :—Monday, October 15, prize slides. Wednesday, October 17, slides by Dr. Tempest Anderson. Saturday, October 20, slides by members of the Lantern Society.

ON Thursday next, October 18, before the London and Provincial Photographic Association, Mr. Birt Acres will read a paper on *Polarisation of Light: its Bearing on Photography*, accompanied by a practical demonstration with the lantern. This is an interesting subject, and, as Mr. Acres has devoted much study and attention to it, a good attendance will, doubtless, result. Visitors will be welcome.

A REMARKABLE example of a famous woman, says a contemporary, who has refused to sit for a photograph is Florence Nightingale. The only picture of her in existence is a photograph taken of a bust in St. Thomas's Hospital, made when she returned from the Crimea. No picture has been taken of the Empress Eugenie for many years, and although she is now a forlorn, decrepit old woman leaning on a cane, the only photograph of her obtainable represents her to be in the prime of life, but garbed in widow's weeds.

PROCESS work calls into action so many trades that it requires almost an encyclopædic knowledge to keep pace with it. Just call to mind how many arts, sciences, and handicrafts are pressed into its service. To mention a few, there are: Chemistry, electricity, photography, lithography, typography, etching, metal-working, wood-working, glass-working and cutting, optics, drawing, ink-making, roller-making, camera-making, paper-making, tool-making, &c., and each one of these departments has many ramifications.—*Process Work.*

IN German and Austrian process studios, says *Process Work*, an increasing use is being made of collodion emulsion, which, as now made, works more rapidly than the ordinary wet-plate process. The emulsion is, we understand, flowed on, and as soon as set, without drying, placed in the camera. This emulsion can be bought ready-made on the Continent, but the heavy duty on anything of the nature of collodion would make its price prohibitive to import. For the three-colour process, such an emulsion, with suitable dyeing matter added, gives splendid results. In fact, the understood Continental way of going about this work is to add the dye-stuff to the emulsion instead of using screens.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—The Council of this Society have for some time past been directing their attention to the subject of increased accommodation for the members, the rooms in the occupation of the Society being considered inadequate for its growing needs. After much inquiry and negotiation, terms have been concluded for the tenancy of more commodious rooms at the Exchange-buildings, Birmingham, which are considered in every way more desirable, The accommodation consists of the use, jointly with the local Architectural Society, of a capital lecture and social room, and the exclusive tenancy of a private room and library and a dark room. The new premises were formally opened on Tuesday last by the President, Sir J. B. Stone, who delivered a short address in congratulatory terms, after which the collection of photographs taken by the President on his recent South African tour were shown and described by him. The pictures consisted of a large series of bromide enlargements illustrative of subjects of a varied and most interesting character, which were much appreciated.

A MUNIFICENT GIFT.—Mr. Frank McClean, says *Nature*, writing to Dr. Gill, under date of August 10, has expressed his desire to present a large equatorially mounted telescope, equipped for photographic work, to the Royal Observatory at the Cape of Good Hope. With this object, he has arranged with Sir Howard Grubb for the construction of a photographic refracting telescope of twenty-four inches aperture, and for an object-glass prism to work with it, having a refracting angle of $7\frac{1}{2}°$ and the same aperture as the object-glass. The glass for the object-glass and prism have already been secured, and the definite order for the instrument was given to Sir Howard Grubb on May 4 last. Coupled with the photographic telescope, there is to be a visual refracting telescope of eighteen inches aperture. The mounting is to be sufficiently elevated to allow a slit spectroscope, for the determination of stellar motions in the line of sight, to be attached to the photographic telescope, and the gift will include such a spectroscope, as well as an observatory of light construction. Subject to the concurrence of the Lords Commissioners of the Admiralty, Dr. Gill has cordially and gratefully accepted this noble gift to the Cape Observatory.

A PHOTOGRAPHIC CURIOSITY.—Mr. F. H. Wright writes to the *English Mechanic* : "I recently had the pleasure of overlooking a number of photographs, &c., the work of Mr. C. Rumbold, Secretary to the Great Yarmouth Cromwell Photographic Society. Among them was one which is quite a curiosity in its way. It was a view of the interior of the Great Yarmouth (St. Nicholas) Church, which, I need hardly say, is noted for its great size. A large Gothic archway occupied the middle distance, with part of ceilings, also brickwork above the arch. No window is anywhere near this position, and yet, very clearly defined, and hiding all the work 'behind' it, is the portrait of a window, apparently about twenty feet in front of the lens, perfect in every detail, only reversed. On development, Mr. Rumbold was so struck with the appearance, that the next day, at the same hour, same exposure, and similar light, he secured another photograph, when nothing of the sort appeared on the plate. He had not noticed any 'window ghost' on the first occasion, and, on the second, when thoroughly on the look-out, could see none. Note: About twenty feet *behind* the camera was the same window that appears in the picture, and Mr. Rumbold is too experienced a hand at the work to have been deceived into an accident. No satisfactory explanation by any one who has seen the photograph has yet been given."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
15	Camera Club	Demonstration of Zenotype. F. J. Abbott and E. J. Browne
15	Central Photographic Club	*Development.* John H. Avery.
15	Devonport	*Mounts and Mounting.* H. Pike.
15	Glasgow and West of Scotland	
15	North Middlesex	
15	Richmond	
15	South London	
16	Birmingham Photo. Society	
16	Brixton and Clapham	
16	Croydon Microscopical	*Primitive Lighting Appliances.* Edward Lovett.
16	Derby	
16	Exeter	
16	Hackney	*Economical Photography.* F. W. Gosling.
16	Hastings and St. Leonards	
16	Keighley and District	
16	North London	
16	Paisley	
16	West London	
17	Brechin	
17	Bury	
17	Leytonstone	The Zenotype Company will give a Demonstration on their New Process of Developing and Toning Gelatino-chloride Paper.
17	Manchester Camera Club	
17	Photographic Club	*For and Against Separate and Combined Baths for Toning and Fixing Printing-out Papers.* S. H. Fry.
17	Photographic Salon	*Legitimacy of Hand Work in Photography.* A. Horsley Hinton.
17	Southport	
17	Southsea	
18	Birmingham Photo. Society	
18	Camera Club	*Limitations and the Legitimate in Artistic Photography. Sundry Notes.* Eustace Calland.
18	Ealing	Annual Meeting.
18	Glossop Dale	
18	Greenock	
18	Hull	
18	Leeds Photo. Society	*Composition and Chiaroscuro.* Edward Renard.
18	London and Provincial	*Polarisation of Light; its Bearing on Photography.* Birt Acres.
18	Oldham	
18	Oxford Photo. Society	
18	Putney	Zenotype Developing and Toning by the Zenotype Company.
19	Cardiff	
19	Central Photographic Club	*The Peak of Derbyshire.* R. Keene.
19	Croydon Microscopical	Demonstrations of the Zenotype Process. E. J. Browne and F. J. Abbott.
19	Holborn	
19	Leamington	
19	Maidstone	
19	North Kent	
20	Hull	
20	Leytonstone	Social Meeting.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 9,—Ordinary Meeting—the President (Sir H. Trueman Wood, M.A.) in the chair. There was a very large attendance, including several ladies.

The following gentlemen were elected members of the Society :—Messrs. S. B. Bolas, Crofton, Herbert Dennison, W. Gamble, C. Hussey, H. R. Hume, and W. J. Wilson.

The nomination papers of fifty-six candidates for admission were read. The President stated that this was the largest number of nominations presented at one meeting.

The HON. SECRETARY announced that the Barrow Naturalists' Field Club and the Stereoscopic Postal Exchange Club had been admitted to affiliation of the Society.

On behalf of Surgeon-Major Barnes, Mr. E. J. Wall presented the Society with a medallion camera, made about the year 1870.

Mr. THOMAS BOLAS, in presenting the Society with an early relief block by the late Mr. W. B. Woodbury, said that it possessed some of the good points of modern blocks. The tones were broken up by means of network, which idea really originated with Fox Talbot. Mr. Woodbury produced the block in 1872, and gave it him (Mr. Bolas) in 1882. Woodbury made his network negative by means of tulle or gauze, took a Woodbury relief, and electrotyped it. Making allowance for certain faults, the block was quite level with the best work of to-day.

The donors were thanked by the meeting, and the President hoped that other members might be induced to present articles of historic photographic interest to the Society.

The presentation of medals was deferred until the next ordinary meeting of the Society, the change in the Society's title having necessitated an alteration in the die from which the medals are struck.

PRESIDENT'S ADDRESS.

The PRESIDENT then read his annual address; this we shall reproduce *in extenso*. Sir Henry paid a high tribute to his predecessor, Captain Abney, and then passed to a review of the position of the Society. The great growth of photographic societies had possibly militated against the numerical progress of the Society; but he thought that, as in the case of the Royal Society, the supremacy of which had at one time been threatened by the institution of the Linnæan, Geological, and other scientific Societies, the Royal Photographic Society would still maintain its position. He urged the general body of members to assist the officers and Council in the work of promoting the interests of the Society, and laid stress upon the need for bettering its financial position. The President then pointed out at considerable length the important help which photography rendered in most scientific pursuits. The meteorologist had been enabled by its aid to study the nature and form of the clouds, the shape and character of the lightning flash; to the microscopist it was the only accurate means of reproducing the objects of his studies; and it had aided the physicist to investigate phenomena which change too rapidly for the human eye to follow. There were, too, its uses in astronomy, metallurgy, ethnology, geology, geography, natural history, and archæology. Dealing with the thorny question of the reciprocal influences between art and photography, the President dared to "timidly and cautiously" hazard the opinion that the advantage had been on the side of the former. He thought that, as regards the "newest photography" or photographic impressionism, the pendulum had simply swung a bit too far. Touching upon the recent advances in photographic optics by Goerz, Schroeder, and Dallmeyer, he next descanted upon the remarkable ingenuity displayed in the manufacture of modern photographic apparatus, saying that, if our results were not better than those of former days, they ought to be. The superabundance and poor quality of the photo-mechanical illustrations in modern newspapers also came in for notice, and the address concluded with a reference to the admirable part which photography had played at the Chicago Exhibition.

Mr. W. S. BIRD moved a vote of thanks to the President for his address, which was seconded by Mr. SPILLER, and carried amid applause. The former gentleman threw out the suggestion that the Society might make another attempt to enlist the financial sympathy of the City in the endeavour to provide itself with a suitable home.

The PRESIDENT having briefly acknowledged the vote of thanks, the proceedings terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 4,—Mr. A. Haddon in the chair.

Mr. W. E. DEBENHAM referred to some remarks made by Mr. Everitt at the previous meeting as to keeping qualities of gelatine paper, and showed an untoned print which he had kept for a year in an ordinary room without any special protection. He thought if toned it would make a good print.

Mr. P. EVERITT said that his remarks had reference to the matt and not the glossy paper, the latter being the surface on which Mr. Debenham's print was made. He quoted an instance where a dealer had discovered a considerable quantity of newly delivered matt paper to be discoloured.

Mr. J. S. TEAPE had used some glossy paper which he had kept for a long time, and found that every print in toning had stained marks on it.

THE ENAMELINE PROCESS.

Mr. HENRI CALMELS gave a demonstration of the "Enameline" process of half-tone block-making on copper. Commencing by describing the uses of the screen in breaking up the tones of the negative, he passed to the negative process itself, those he showed being collodion negatives. Dry plates, he said, did not give such sharp results. The copper plate, having been cleaned with zinc oxide or whiting and methylated spirit, it is coated with the following mixture:—

Fish glue (Le Page's)	1 ounce.
Ammonium bichromate	30 grains.
White of egg	7 drachms.
Water	2 ounces.

He touched upon the properties of the different varieties of fish glue, saying that he preferred the ordinary non-clarified kind. The above solution having been filtered, the plate is coated in the same way that collodion is poured on to glass. When the film is dried the negative is placed in contact with it, under pressure, an exposure of about two minutes in the sun being about the average time required. After exposure the plate is treated with cold water, which dissolves off the unaltered parts of the film. When dry, heat from a flame is applied to the back of the plate to carbonise the fish glue left on its surface. Answering a question, he said the film only cracked when the copper plate was bent. The next stage is the etching of the plate; this is done with perchloride of iron solution, Mr. Calmels recommending for the deeper etching a solution at 45° Beaumé, and for a very large dot, dilution down to 30°, which would act much quicker than the former. In reply to a question he said that the size of the dots varied with the distance of the screen from the plate. To give some idea of the distance, he said that, when working with the lens at *f*-16, he should place the screen at a distance of about a ninth of an inch from the plate.

The practical part of the demonstration was then proceeded with. Mr. CALMELS showed plates in various stags of preparation, and described the conditions for successful inking, &c.

In reply to Mr. EVERITT, he said that the advantage of the fish glue over bitumen was that the former required a much shorter exposure. For example, bitumen exposed to the electric light would need an exposure of two hours, whereas, with the fish glue, an exposure of ten minutes sufficed. As to the inclusion of the albumen in the sensitising mixture, he said that fish glue did not clean off the plate so well without the albumen. The process had not been applied to zinc, although he himself had been experimenting in that direction, and hoped to get a process to work as good or better than copper.

During the evening, Mr. CALMELS answered a number of other questions in reference to the demonstration, for which, on the proposition of Mr. Everitt, he was very heartily thanked.

PHOTOGRAPHIC CLUB.

OCTOBER 3.—Mr. F. HAES in the chair.—There was a large attendance.

PHOTO-MICROGRAPHY.

Mr. ANDREW PRINGLE, F.R.M.S., gave an address on this subject (illustrated by a large number of lantern slides), which was listened to with very great attention. The following is an outline of the principal heads of the discourse:—For all classes of work he strongly recommended the *best* instruments, set up on a perfectly rigid base. He much preferred the microscope platform to revolve on the lower one, instead of having it a fixture and then screwing oneself into contortions to focus the object. All screw adjustments should be as near perfection as possible, and without kicking or looseness. One should make oneself thoroughly acquainted with the capabilities of the microscope, otherwise it was useless to go the other end of the system, *i.e.*, the camera. Apochromatic glasses were the ones to use, but in many cases an ordinary photographic instrument would yield best results. The difficulties of "low-power work" all centered in the matter of "illumination"—remedy obvious. Difficulties of "high-power work"—want of experience—remedy also obvious. He laid great stress upon the value of "colour-correct plates," especially Lumière's. It was no use attempting photo-micrography lightly; it was the most beautiful, scientific, useful, and interesting branch of our art-science, and required the closest attention. In the matter of specimens he had found it absolutely necessary to prepare his own owing to the thinness. He did not advocate extreme thinness in all cases, for that might defeat the object, instancing the longitudinal section of a tadpole, which, if too thin, would be more ghost than tadpole. He strongiy advocated practice on "test objects," as by them one could note one's own progress. They had another use, too; if one felt getting "rusty," let him go back to the familiar "test object." Many beautiful specimens were projected upon the screen, which Mr. Pringle described as easy, comparatively easy, difficult, and very difficult, as they were shown. From his remarks it appeared *easy* in some cases, but you had to get the "preparation," *i.e.*, object. Some of the slides were coloured, as they would appear in the microscope, which had been done by request of his friends (teachers in medical schools); but, where he had a coloured and an uncoloured slide of the same "preparation," it was easy to see that what one gained in colour was more than lost in want of sharpness. Where Mr. Pringle went beyond his own experience he most carefully gave credit to the authors, either of discoveries, hints, specimens, &c. A large number of slides were shown on the screen as illustrating various points—easy subjects such as sections of deal, done with a photographic lens; blowfly's tongue at various apertures; some insects done by Mr. Carnell; several diatoms in order of difficulty, including some of Dr. Van Heurck with the famous Zeiss lens of N.A. 1·6. Then followed some specially fine slides of subjects said to be easy enough when you get the preparations; then more difficult subjects, such as *filariæ*, "diapedesis," cancer "bodies," interesting bacteria, spermatozoa; and, finally, some flagellated organisms, which were represented as presenting the difficulties of great magnification and very high aperture. For instance, there were shown the flagella, or lashes, of the bacillus of Asiatic cholera and of *B. Termo*. Concluding, the lecturer dwelt upon the fascination of the science, but warned the photographer that he must make himself a fairly expert microscopist, just as he warned the microscopist that he must acquire a fair mastery over photography before either could expect to become an expert photo-micrographer.

At the conclusion, the CHAIRMAN spoke appreciatively of the able demonstration Mr. Pringle had given.

Mr. T. CHARTERS WHITE added his testimony to the benefit he had received from listening to Mr. Pringle. He likened himself in this work to a mole, whilst Mr. Pringle was the eagle that had soared up and had actually faced the sun in so far that he had produced results that he (Mr. Charters White) had never seen excelled.

Central Photographic Club.—On Saturday last a considerable party of members of the Central Photographic Club visited the optical works of Mr. William Wray, of Highgate. The party were received by Mr. Turnbull and the Brothers Wray, who explained the details of the process of manufacturing photographic lenses, and incidentally also telescope and microscope work. The methods were traced from the raw material both in glass and in metal (brass and aluminium) to the finished articles. The party was strictly informal, and broke up into three sections, one with each of the conductors, and much interesting information was elicited by the questions of the visitors. Practical difference in working between the recognised English methods and the French methods of producing cheap lenses were explained in answer to queries. By the end of a couple of hours some of the members were obliged to leave for

their trains, but the remainder were so interested in what they saw that they remained much later, and concluded a very pleasing afternoon with a light repast provided by their entertainers.

Croydon Camera Club.—An unusually crowded meeting was held on Wednesday, the 3rd inst., when the President (Mr. Hector Maclean) inaugurated the winter session by an address upon various matters specially interesting to the members of the Club and to photographers at large, in the course of which the series of summer excursions, numbering over twenty, was stated to have been unusually successful. In this connexion a special vote of thanks was accorded to the Duchess of Marlborough for permitting the Club to visit and photograph at the Deepdene. As regards the immediate future, arrangements were being made to continue the series of public lantern shows, which had in the past year been so much appreciated. Turning to the three photographic exhibitions now open in London, Mr. Maclean at some length touched upon the good and bad work to be there seen, and also spoke upon the lessons to be learnt by the photographic amateur, many of the points being illustrated by prints of the works referred to. Mr. Maclean next sketched the three main systems of artificial lighting as applied to photography. Of the three systems —magnesium, incandescent gas, and electric light, the latter seemed to be the most successful, as evidenced by a number of photographs taken by its means by Mr. Frank Dickins, of Sloane-street, which were greatly admired. Before concluding, Mr. Maclean showed and, where necessary, explained several more or less minor, but none the less useful novelties, of which the most humble met with the greatest approval, viz., Kent's dark room pins. Other items which were considered praiseworthy were the same firm's storage album for films, and a light and well-devised lantern slide box; also the Christia ruby material, which some members who had tested it thoroughly approved. Following the Presidential address, Mr. A. W. HIRST gave a very practical and most useful demonstration upon *A Simple Method of Enlarging*. Using a lantern, "which he knocked up in a couple of hours," fitted with six-inch condenser, he enlarged a quarter-plate to 12×10 on Ilford Rapid paper by means of burning five inches of magnesium ribbon, working at *f*-11. The iron developer was used; exposure was found to be full, and the resulting picture was, without question, much above the average of ordinary work of members. This, though *à priori* the simple means employed, would not have suggested that so perfect a result would ensue. Mr. Hirst, who undertook the demonstration at a few hours' notice in consequence of the unavoidable absence of Mr. G. R. White, was accorded a very hearty vote of thanks.

Ealing Photographic Society.—October 4, Mr. H. W. Peal in the chair.—The CHAIRMAN spoke on the subject of the programme for the ensuing season, and urged members to help the Society by giving either a paper or demonstration (not necessarily a long one), and by so doing taking the work a little off the shoulders of those who, up to the present, have done all. Messrs. Crisp and Gregory were elected auditors. Some examples of summer work were shown by several members, and a general discussion followed.

Hackney Photographic Society.—October 3, Mr. R. Beckett presiding.—This was the first meeting held in the new club-room. Members' work was shown by Messrs. Roofe, Farmer, Westcott, and Dean. Mr. Wilks asked whether it was possible to enlarge on Alpha paper with gaslight, and received many opinions to the effect that it was too slow, but Mr. Grant thought that it might be done by using the incandescent gaslight, as this possessed great actinic power. The exposure necessary for enlarging on bromide paper with this light was fifty or sixty seconds, as compared with twenty or thirty minutes when using a double-wick paraffin lamp. Alpha paper being about thirty times slower than bromide paper, the exposure would still be brought within practical limits. Care was necessary not to shake the burner, or the mantle would be broken. A discussion arose as to the best type of negative to use for zenotype toning, and evoked the general opinion that plucky negatives were necessary. In prints from thin negatives the shadows were blocked. The answer to Mr. Fort's question, "What is a sepia tone?" demonstrated that much difference of opinion exists as to the particular shade implied by the term. Mr. GARDNER thought that sepia was a distinct colour, and might be in several shades. Mr. HENSLER asked how to obtain sepia tones on platinotype paper. He was advised, in default of using the sepia paper, to add a few drops of mercuric chloride solution to the oxalate developer. Mr. GRANT had obtained a warm black by giving full exposure to the new cold-bath paper, and then restraining development with glycerine. Mr. A. BARKER inquired for a good formula to intensify a thin lantern slide. He was advised to bleach with mercury, and then blacken with soda sulphite, or by redeveloping with metol or quinol developers.

North Middlesex Photographic Society.—On the 29th ult. this Society wound up its summer-outing season by a visit to Hampstead Heath. After the purely photographic work was over, the members adjourned to the Bull and Bush, where twenty-six sat down to a knife-and-fork tea, to which they did ample justice, as do all good photographers when work is over. The inner man being satisfied, the tables were cleared, and, amid a cloud of blue smoke, harmony and sweet sounds prevailed for the rest of the evening. Messrs. Allpress, Glover, Gregory, Addison, Pither, and the Secretary warbled. Treasurer Smith and Mr. Norris recited (the intensity of the latter gentleman's effort being somewhat rudely broken in upon by a too-audible waiter and his order for "Two portions of potatoes, please!"). Mr. McIntosh told a story, Mr. Mallocks (a sort of Corney Grain-cum-George Grossmith the second) was in great request for his humorous sketches and also his accompaniments, and the President, who was in the chair, contributed a few short and witty speeches. At half-past ten steps were turned homewards, a very jolly time having been spent.

ON Monday, October 8, Mr. Robinson attended to demonstrate mezzotype paper. His remarks were few, he evidently saving himself for the battery of questions which he expected to be brought against him. He proceeded at once to tone a print, using for the purpose a borax bath, composed of borax, sixty grains, dissolved in ten ounces of hot water, and, when cool, one ounce of gold added. This toned to a nice sepia. The principal points in connexion with this paper appeared to be to follow exactly the instructions sent out with it: be sure to rid the paper of the free silver and acid before toning, and be careful not to over-tone. Mr. H. Smith took first place for the Chingford competition. Monday, October 15, Mr. W. Taylor will demonstrate *Lantern-slide Making by Reduction by Artificial Light*. Visitors will be welcomed.

Northern Photographic and Scientific Association.—On Thursday, October 4, a meeting of the above Association was held. The officers for the ensuing session were elected, and after other business had been transacted, some specimens of photo-micrographic work were exhibited, and criticism and general conversation followed. The next meeting will be held on Thursday, the 18th inst., and subsequent meetings on alternate Thursdays at 8 p.m. The Association now meets at 1, High-street, Wood Green (offices of Mr. T. W. Muskett). Subscription for the session reduced to 2*s.* 6*d.* W. H. Rickinson, Hon. Secretary, 1, Lascott-road, Wood Green, N.

Richmond Camera Club.—The winter session opened on Monday last, the 1st inst., with a display of lantern slides, by Mr. H. Little, when the Masonic Hall was well filled by members and their friends, including many ladies. An interesting and beautiful selection of slides was shown, illustrative, chiefly, of the Riviera and Rome, amongst the finest being an admirable series of interiors of some of the Roman churches, St. Peter's, St. John Lateran, and St. Paul's-without-the-Walls. These were followed by a few miscellaneous views of English scenery and buildings, and some yachting scenes, including a very fine picture of the *Britannia*.

Aberdeenshire Amateur Photographic Society.—The Annual Meeting of this Society was held in the Studio, Broad-street, on Friday, October 5, Mr. W. A. Hawes in the chair.—There was a large attendance—the largest that has yet been seen at an annual meeting. The SECRETARY (Mr. James Main) presented the annual report, which showed that during last year the Society had enjoyed continued prosperity, and that the membership was constantly increasing; and the Treasurer's statement, which reported a balance in hand, was also very satisfactory. The Secretary's report detailed the proceedings of the Society since last annual meeting, and referred to the various excursions that had taken place during the summer season. The following office-bearers were elected:—*President:* Mr. W. A. Hawes.—*Vice-Presidents:* Messrs. George Robertson and Alexander Mackilligan.—*Committee of Management:* Messrs. Glass, Duffus, Grant, Grubb, Smith, Stewart, and Gibb.—*Lanternist:* Mr. James Milne.—*Treasurer:* Mr. Thomson.—*Secretary:* Mr. James Main, 75, George-street. An interesting set of views by Mr. Pardy, a member of Pietermaritzburg Camera Club, were afterwards thrown on the screen by the lantern, the different pictures being suitably described by Mr. Pardy, who was accorded a very cordial vote of thanks. The views related principally to Durban and Pietermaritzburg, and included some striking pictures of the native chiefs, their wives and children. A great variety of slides by members of the Society were next displayed. These afforded abundant evidence of an active and profitable summer season, some excellent work being shown. Mr. Hawes, as usual, was to the front with a collection of delightful subjects, and a number of very beautiful flower studies were shown by Mr. George Robertson. Altogether the members and their friends enjoyed a capital evening. As the season goes on, the collection of slides will be largely added to, and several public exhibitions by the Society are in contemplation.

Sheffield Photographic Society.—The annual meeting of this Society was held in the Masonic Hall on the 2nd inst., when the President (Mr. E. Beck) occupied the chair. The Treasurer presented his statement of accounts, which was adopted. The Secretary read his annual report of the proceedings of the year, which showed there had been seven lectures, three demonstrations, and two social evenings. The Society had presented photographic albums to the various charitable institutions of the city, and its list of members was at present greater than at any previous time. The President announced the Judges' awards in the annual competitions, Mr. Camp taking the Society's silver medal, and Mr. W. M. Toplis, the President's prize. A short discussion took place with regard to future competitions, and the matter was left for the Council to deal with. The election of officers for the ensuing year was next proceeded with, and resulted as follows:—*President:* Mr. Thomas Firth.—*Vice-Presidents:* Messrs. B. Nowill, E. Beck, and J. A. Tomlinson.—*Council:* Messrs. T. Hibbert, W. T. Furniss, E. H. Pearce, D. C. Brooks, and R. M. Loxley.—*Reporter:* Mr. G. W. Blackwell.—*Treasurer:* Mr. J. Smith.—*Secretary:* Mr. S. Camp.

FORTHCOMING EXHIBITIONS.

1894.		
October 12–Nov. 3	...	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 12–Nov. 14	.	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,, 22, 23	.....	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	.....	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17	.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22	.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22	....	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1		*Stanley Show (Photographic Section).
,, 27–Dec. 1		*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,, 29–Dec. 1		*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
1895.		
March 25–30	.....	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 18,651.—"Improvements in Binding Pattern-cards, Photographs, and the Like." Complete specification. V. DARD.—*Dated October*, 1894.

No. 18,796.—"Improvements in Construction of Line Screens used for Production of Half-tone Negatives for the purpose of obtaining Blocks or Stone or other suitable Surfaces, to be Printed from in one, two, three, or more Colours." G. G. WARD and M. COHEN.—*Dated October*, 1894.

No. 18,803.—"An Improved Lock for Photographic Dark Slides." H. RANSOM.—*Dated October*, 1894.

PATENTS COMPLETED.

A COMBINED PHOTOGRAPHIC CAMERA AND OPERA, FIELD, OR LIKE GLASSES.

No. 3954.—R. H. BUTTERWORTH, 30, Stanley-street, Galashiels, N.B.—*September* 8, 1894.

THAT the parts invented can be applied or added to any field, tourist or opera glasses in present use, and have for their object the conversion of field, and opera, or like glasses into "a combined photographic camera and opera, field, or like glasses" without increasing their size.

One eyepiece of any field, opera, or like glasses, is removed, and a special shutter and lens, made all in one piece, is pushed down into the focussing chamber of the tube, and practically takes the place of said eyepiece; this lens and shutter is of my invention, and is worked as follows:—

The shutter end of the instrument is pointed at an object or landscape for producing a photographic picture or copy thereof, and the object or view pointed at can be seen through the second tube of the instrument, which remains exactly as formerly, and acts for the time being as a view-finder, and shows the size of the picture as it will appear when taken on a sensitised plate or film held at the object-glass end of the instrument.

An imperceptible point of a pivoted and tongued lever is then depressed, which lifts the tongue of said lever out of a slot cut in the edge of the circular shutter plate.

The normal position of the tongue of said lever is in the slot, and a spring is fixed on to the under side of the lever, which keeps the tongue in its place and causes the lever to project slightly above the shutter mount, so that it can be actuated by the finger.

The movable circular shutter plate is pivoted between, and slightly projects past, two other plates connected by a half ring of metal or suchlike; these plates project over the half ring so as to make a groove on the outside between the two plates, and in this groove is fixed the above-mentioned lever, with its tongue pointing or projecting inside the ring and on to the edge of shutter plate; the two plates have a hole cut through the centre of each, corresponding to a hole cut through the movable shutter plate.

The circular shutter plate is made heavier on one side or in one half of its circular face or diameter than the other, and has a circular hole cut through its lightest part, and corresponding to the holes in the two plates. The lever being depressed and the tongue lifted out of the above-mentioned slot, the shutter plate is free to swing round by its own weight, exposing during half its circular movement the hole in the shutter plate to the permanent holes cut through the front and back plates of the shutter mount, thus admitting rays of light passing from an object or landscape into the interior of the instrument, through the field lens and object-glass on to the film or sensitised plate, and, upon the circular movement being completed, the lever locks into the slot, and the holes in the mount are closed, thus stopping the light from entering the instrument. This action of opening and closing the holes causes the shutter to make an instantaneous exposure.

The shutter plate, in projecting past the front and back plates of the mount, may be moved round with the finger or thumb, till a lock or catch is made by the lever tongue into a slot in the plate edge, which intimates that the hole in the plate coincides with the holes in the mount, and that the light is entering simultaneously through the holes in the shutter plate and mount, and thus into the instrument. The light is allowed to enter for a certain period of time, thus causing a time exposure to be made, after which the point of the lever is touched as before, and the shutter plate is released and swings back or round into its original or normal position, and prevents any further light entering the instrument until the process is repeated.

The object-glasses will remain in the opera, field, or like glasses, and retain their original positions.

The hood of the object-glass on the side of the instrument which holds the shutter and lens is pulled slightly forward for about a quarter of an inch, so as to allow a circular rim, which can be made of iron, brass, or aluminium, to slip into the hood or over the casing containing the object-glass. This rim has a circular plate fixed on the top of it, with a square or other recessed and framed hole cut through it, and a special hinged frame fixed on to the said plate, so that the frame can open and close over the square or like hole in the circular plate, and lock itself by means of a S-shaped hook or catch. The object of this rim, with plate and hinged frame, is that, when a sensitised plate or film, contained in a slide, sheath, or plate-holder, is placed in the recessed and framed hole, and the hinged frame closed over the top of said slide, sheath, or plate-holder, the hinged frame locks it into position over the object-glass of the instrument.

The parts of the invention above described form a device for a combined photographic camera and opera, field, or like glasses.

The method of using the instrument will be as follows:—

The plate-holder containing the sensitised medium is held firmly in position over the object-glass, and allows the slide of the plate-holder to be drawn, the shutter is pointed towards the object to be photographed, and the exposure is made by admitting the rays of light from the object to the sensitised surface contained in the slide or plate-holder by the action of the shutter opening and closing the holes before mentioned.

If the glasses are now inverted, and the eyepiece and the hole in the shutter plate be looked through, you have the field, opera, or like glasses as before.

Nothing is removed or added to the glasses; there is no screwing, unscrewing, changing tubes or glasses, or alteration whatever to be effected after once the device is applied to the glasses.

No screws, cement, or solder are used in the applying of my invention to any of the glasses in present use as opera, field, or like glasses, and they are not increased in size.

And, after my invention is applied, there need be no changing or altering from, or adding to, anything connected with the glasses to make it a combined photographic camera and opera, field, or like glasses, and yet at the same time the glasses will open and focus in the usual way, and close up and go into the original case that was made to hold them.

My invention improves the utility of the glasses, as they are always ready for use, and are in focus as a photographic camera as soon as they are taken from the case.

All the usual field glasses with twin telescopic focussing-tubes can be fitted with my invention, and be used as a combined photographic camera and opera, field, or like glasses.

It is applicable for the use of tourists, architects, draughtsmen, detectives, the army, and photographers generally.

The claims are as follows: 1. A photographic lens, and a movable circular shutter plate with an aperture in it, both contained in a tube, which tube takes the place of the ordinary eyepiece in any opera, field, or like glasses, thus making "a combined photographic camera and opera, field, or like glasses." 2. A round or square frame, with a round or other hole through it, and a rim attached to the frame so that it can be pushed into the hood or over the casing of any opera, field, or like glasses, so as to hold a film or plate-holder and a slide. 3. A film or plate-holder, with a case or pocket for containing same, and a movable slide for exposing the film or plate to the action of light. 4. Applying the device to any opera, field, or like glasses, so as to form a combined photographic camera and opera, field, or like glasses, without increasing their size. 5. Applying the device without screws, cement, or solder. 6. The herein-described arrangement forming "a combined photographic camera and opera, field, or like glasses," applicable to all the usual twin-tube focussing glasses, and so adapted that they can be used by tourists, architects, draughtsmen, detectives, the army, and photographers generally as "a combined photographic camera and opera, field, or like glasses."

IMPROVEMENTS IN THE CONSTRUCTION OF PORTABLE PHOTOGRAPHIC CAMERAS AND STANDS.

No. 17,022.—W. J. SPURRIER, 3, Queenswood-road, Moseley, Birmingham, Worcestershire.—*September* 8, 1894.

To produce portable photographic cameras and stands of extreme completeness, compactness, and lightness.

For this purpose the cameras are made of a series of aluminium sliding tubes, with springs for expanding same, the sensitive surfaces of films or plates with their backing pieces being stored in a box or magazine, also of aluminium, which is provided with grippers &c, for releasing them, or in dark slides. The tubes I preferably construct of a square or similar shape, the connecting edges of any two tubes being respectively turned inwards and outwards so that they over lap each other at their junction when drawn out, the said edges being covered by a textile material. The expanding springs are placed at the sides of the larger tubes, to which one end of the said springs are fixed, the other ends being attached to the inner flange of the smaller tube or tubes. Outside, at the bottom of the largest tube, is a screw plate, or a taper groove is made with a spring catch, for holding the camera on to the stand. The shutter is composed of two equal-sized segmental plates, perforated with the necessary apertures, and mounted upon a pivot somewhat after the manner of a pair of scissors, closed by a pair of springs and opened by pressure being applied to the ends which project past the pivot.

The magazine consists of a box, mounted on pivots, made out of a sheet of aluminium, cut into such a shape, that the sides and ends with ears only have to be turned up at right angles to at once form a box, to which there is a frame or lid, with the centre cut out, with a spring and release peg to hold in the films &c., and into the said ears at each end are hinged a pair of grippers. These grippers are bent at an obtuse angle of about 160°, so that, when the magazine is swung on the pivots, two projecting points on the inside of the camera come into contact with the inclined planes of the grippers, which are thus opened and closed. Upon further swinging the magazine, an elongation of the frame catches against a peg and opens the frame. Upon the pivot connected to the actuating thumb piece, is fixed a see-saw, which drives apart the two ends of levers extending to the front of the camera, for the purpose of setting the shutter. Upon the other side of the magazine is fixed an arm, which extends to the back of the lens, over which is pivoted a cover, which is bent at an acute angle, so that the arm lifts the cover.

Upon one of the magazine pivots revolves a register dial, to indicate the number of exposures made. The edge of the dial is serrated in such a manner that in its movements the gripper comes in contact with a serration, and turns the dial, to exhibit the various numbers in succession. By imparting a slight movement to the thumb piece, which is outside the camera, but connected to the magazine in which the sensitive surfaces, &c., are stored, the grippers and frame are opened, and one of the sensitive surfaces with its backing card (which card is of smaller dimensions than the film or sensitive surface, to permit the grippers to hold the next following one), falls into a well in the bottom of the camera, where it is held by a spring attached to the bottom of the magazine. This same action closes the lens cover, sets the shutter, and registers the number of exposures, simultaneously, by the means described.

The magazine and its component parts may be used for the purpose of deliver-

ng other than sensitive surfaces such as films. A spirit level is placed on the top of the magazine, under a ruby window, in the camera. A series of lenses of various foci is mounted on a pivoted segmental plate. For the purpose of making the stand of extreme lightness, a consummation so much desired, the whole is constructed of sheet or wire aluminium, the head being of triangular form, the edges are flanged downwards and inwards, for the purpose of fitting into the grooved camera fitting. In these flanges are holes to receive the pegs on the stand legs. The legs are either made the full length, with stretcher pieces, or of crescent or angled strips, with one or more double joints in each, the said joints being formed by a headed pivot, mounted on a spring, the pivot passing through a hole some inches from the end of each strip.

A New or Improved Process for Separating Photographic Gelatine Films from Celluloid Supports or Bases.

No. 19,810. Alfred Allen Barratt, Cleygate Vicarage, Esher, and Albert John Eves Hill, Brighton-road, Surbiton, both in the county of Surrey.—*September* 8, 1894.

Our said invention relates to a new or improved process for separating photographic gelatine films from celluloid supports or bases.

Celluloid supports or bases, coated with sensitised gelatine films, are, for certain purposes, preferable to similarly coated glass plates, inasmuch as they are light, extremely thin, and practically unbreakable; but a serious objection to them is, that the nature of the celluloid renders them inconvenient to print from, or, as transparencies, owing to the celluloid not retaining its flat form, and it has hitherto been impossible to float the film off the celluloid support or base on to a glass plate by reason of the close union of the celluloid with the gelatine film.

Now, the object of the present invention is to provide means of readily separating the negative or other gelatine film from the celluloid support or base, and floating it on to a glass plate, so that it may be employed in the ordinary manner.

For this purpose, we place the celluloid negative in a solution of acetone, or amyl-acetate and water combined, in suitable proportions, such as, for example, of about :—

One part of amyl-acetate or acetone.

Three to six parts of water.

This compound penetrates the gelatine film, and attacks the surface of the celluloid beneath the same, thereby loosening such film, which may then be stripped or floated off the celluloid support or base, on to a glass plate, and dried.

When it is desired to enlarge the film, sulphuric or hydrochloric acid, or preferably a vegetable acid, such, for example, as citric, tartaric, or glacial acetic, is applied to the film in combination with the acetone and water in the proportion of about one ounce of the former to about three ounces of the latter.

Or, for the same purpose, the stripped film may be steeped in a solution of the vegatable acid until it becomes saturated therewith, when it should be transferred to a water bath, in which the enlargement will take place.

In combination with the process above described, we may employ suitable chemicals, either to preserve the density of the film or to increase the same.

For the first of these purposes, we prefer to employ sulphate of iron, and for the second bichloride of mercury, followed by ammonia, as in ordinary photographic procedure, but any of the usual methods employed for like purposes may be adopted.

The claims are: 1. The herein-described process for separating photographic gelatine films from celluloid supports or bases, consisting in soaking the celluloid negative in a solution of acetone or amyl-acetate and water, combined in suitable proportions, substantially as herein described. 2. In the separation of photographic gelatine films from celluloid supports or bases, the employment of a solution consisting of amyl-acetate or acetone and water, in or in about, the proportions herein stated.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PYRO AND GLYCIN.

To the Editor.

Sir,—In your experiments with glycin you don't appear to have turned your attention to the above combination, which I have found to work well. My attention was called to it by a paragraph in the *Photographic News* for last August 17. The form in which I use it is this :—

Stock Solution A.

Glycin	1 grain.
Sulphite	5 grains.
Potassium carbonate	4 „
Water to	1 drachm.

For developer I take 4 drachms A, pyro 2 grains, potassium bromide 1 grain, water to 2½ ounces, adding more alkali as required, and, if necessary, a little more pyro, though longer development generally does as well. I find I get excellent negatives with this, and particularly bright and clear. I wish you would make some experiments in this direction, and give your opinion of it. I agree with the writer of the paragraph that it is a very clean developer.—I am, yours, &c., Clifford E. F. Nash.

October 8, 1894.

THE OWNERSHIP OF NEGATIVES.

To the Editor.

Sir,—I beg to thank you for your insertion of my previous letter (page 591 of this Journal), and the report of Mr. Dunning's case, Usk, Mon., with the Judge's very emphatic declaration of the law, in favour of the professional photographer.

Another of our members has had his property (the negative) claimed by his customer. I have the pleasure, in compliance with his application to me as Secretary N. A. P. P., to forward him all possible information, especially referring to the recent important case of his fellow-member, Mr. Dunning. The profession will be glad to learn that the "customer" now finds out his mistake. The member writes me that the decision (Dunning's case) gave him confidence in disputing the illegal claim. The decision, no doubt, became known to defendant's solicitor on inquiring into the merits of the case.

I am not at liberty to give member's name at present, because there is yet another item in dispute.—I am, yours, &c.,

D. J. O'Neill, *Secretary, N. A. P. P.*

47, *Charlotte-road, Birmingham, October* 8, 1894.

COMMERCIAL PHOTOGRAPHIC PROGRESS AT HOME AND ABROAD.

To the Editor.

Sir,—In reference to your article "Commercial Photographic Progress at Home and Abroad" (p. 626, October 5), we are happy to inform you that we have had some two years now, a very fine series in carbon, of National Gallery reproductions, sacred and secular, ancient and modern, likewise similar reproductions of classic masterpieces of Greek and Roman sculpture from the British Museum. As these were only obtained by a considerable outlay of time, money, and skill, we should be grateful for any assistance in bringing them prominently before the photographic world.—We are, yours, &c.,

Woodbury Permanent Photographic Printing Company,

October 7, 1894. *per* J. Liddy.

P.S.—We are now on the list of English collotype printers (power and hand presses).

EXHIBITION RULES.

To the Editor.

Sir,—I notice in your last issue a letter from the Secretaries of the Leytonstone Camera Club, wherein they give one of their exhibiton rules as follows :—"Where a medal is awarded for a set of lantern slides, the negatives may be used for the production of prints for competition." Is not this against the rules of the Affiliation Judges? To my mind, the present regulations governing exhibitions of this kind are too confusing, and the Affiliation Judges appeared to have got over the difficulty, and placed the rules of the various exhibitions on a universal footing. If a set of rules could be arranged which all societies would abide by, it would be a convenience to exhibitors, who would then know under what conditions they were competing without the confusion resulting from so many sets of exhibition rules. Apologising for taking up so much of your valuable space.—I am, yours, &c., R. H. Edwards.

October 8, 1894.

HAND-CAMERA CLUB.

To the Editor.

Sir,—It will be remembered that some eighteen months ago a Club for hand-camera workers was mooted, but was allowed to drop owing to intervening difficulties. Having again been urged to take the matter up, I have decided to go through with the matter this time. Some of the same difficulties may still exist, but they must be climbed over, that's all.

The list of names and promises received is a sufficient warrant for again dealing with the matter. This year, too, the general press are rendering aid, as witness the following, from the *Manchester Evening Mail.*

"The hand camera has now assumed such a position in the photographic world, in spite of the sneers and jests which greeted its appearance, that

even a special Club is proposed for hand-camera workers. The idea is not exactly new, because it was started twelve months ago, but some difficulties intervened. The history of the movement is as follows:—Mr. W. D. Welford, editor of the *Photographic Review of Reviews*, suggested the formation of such a Club. The idea met with considerable favour, but it was found difficult to bring together the contending factors—the so-called art photographer and the technical, which latter insists upon the portrayal for future ages of not only artistic pictures, but representations of real life. The matter seemed like falling through, but is again revived by one or two of the best-known Manchester workers, who have entered into communication with Mr. Welford with the hope of getting something really accomplished. Prominent amongst these gentlemen I may mention the name of Mr. J. W. Wade, a past official of the Manchester Society, and Mr. S. L. Coulthurst, whose *forte* is the portrayal of street life. So far as I can understand the matter, the Club will consist of a number of enthusiastic hand-camera workers, and the object of it will be to obtain the due recognition of what the hand camera can do, not only photographically, but by recording for future generations the manners and customs, dress, &c., of the present time."

To make some sort of definite start thereto, I will deal with the ideas expressed by correspondents, and my own as well.

1. The Club must be confined strictly to hand-camera workers, and its object, the encouragement of *every* branch of work—not the artistic side only, but the useful side as well, with a view to raising the general excellence of such work.

2. One, or perhaps two exhibits of work per annum, held in the various large centres in rotation. No doubt some of the clubs would only be too glad to organize these, or, rather, to farm out the exhibition.

3. Circulating portfolios, the prints in which to be criticised by an artist, painter, and a photographer. The criticisms, however, to embrace both the artistic and useful aspects.

4. The general membership to be untrammelled by any definitions of class or sex; in fact, be absolutely open to any one. But some arrangement should be made for the elevation of the best works inside the Club. The members might be divided into ordinary members of the society (which is, perhaps, a better word than club), and "Fellows" of the society. These latter should be men who have earned the distinction by good work, and one way of electing them would be to grant diplomas at the exhibitions to the works deserving them, such diplomas carrying with them the distinction of "Fellowship." This does away with the medal business, and yet will prove the very best incentive to progress. No elections to "Fellowship" (with the exception of the President, of whom more anon) to be made except of good work, that is, the distinction should be earned, not given in a merely ornamental way to a celebrated stranger, for instance. This idea should meet the views of those who object to be associated with the veries tyros and novices, who proved one of the stumbling-blocks in the last effort. By all means, include in the general ranks *every* hand-camera worker, but let there be some distinction for the really good men; this will, in addition, be the means of greater effort on the part of each member to improve.

5. Hand-camera work to be defined as a print from a negative taken in a camera held in the hands only. The use of a tripod or other support need not be in any way discouraged, but the resulting work, as far as the Society is concerned, must be treated as stand-camera work.

6. The chief officials to consist of President, Hon. Secretary, and a Council; the latter to consist of an equal division of Fellows and ordinary members, and perhaps some division of London and country representation. The President to be a Fellow, and, if not one at the time, to become so by election to office. He must retire annually, and cannot be elected more than twice in succession. Probably, also, minor officers will be required, such as local Hon. Secretaries for the Exhibitions, Curator of the Portfolios, &c. There is also the chance, too, that in a short time an Exhibition in the early autumn would become a sort of meeting like the Convention, an outing at which the members could meet each other, and at which papers might be read. This may sound very ambitious, but there is no earthly reason, considering the enormous number of hand-camera workers, why it should not come to pass.

7. The headquarters would have to be in London, and Council meetings held there, except when chances occur (such as at Exhibition time) of holding them in the provinces.

8. A small subscription from ordinary members would suffice, and probably an increased one for Fellows advisable.

9. A membership of 150 to 200 would be quite enough with which to make a definite start.

10. An early opportunity of holding an exhibition should be seized, and perhaps some of the existing photographic clubs or societies might offer to provide the necessary space. If so, I shall be glad to hear from them.

The foregoing are a few general ideas. Now I ask all those willing to join to communicate at once with me, stating:—

1. Willingness to join the Society without any conditions as to its plans and arrangements.

2. If any particular idea or plan will prevent their joining, and which one.

3. If the amount of subscription is a factor. If so, state maximum amount.

And I would add emphatically to state their ideas generally upon the matter, suggest other features or points, &c.

There is no reason for delay; let us get on and get the matter forward at once.

WALTER D. WELFORD.

57–58, *Chancery-lane, W.C., Oct.* 7, 1894.

DEFUNCT EMERSONISM AT THE SALON.

To the EDITOR.

SIR,—I was at the Salon last week, and with respect to the fuzzy triumphs of Messrs. Davison, Bryant, Maskell, & Co., I must thank you for endeavouring to elucidate their pictures (?), and vainly trying in your last week's review to give your readers some information as to their possible *motif*. I happened to be in town on the opening day, and accordingly weighed in at both Exhibitions (Salon and Pall Mall), but some of the Salon attempts took my breath away, No. 189 fairly "taking the cake." These gentlemen, who are no doubt trying to educate the photographic aspirant, should certainly be medalled, if medals there be as awards, and there are plenty nowadays, goodness knows. The difficulty in this respect will soon be to find a photographer (amateur or professional) who is not a medalled man. Now, Mr. Editor, I want to know if the followers of the "deceased" Dr. Emerson, the past grand master of fuzziness, indistinctness, and indecision, cannot follow their leader in all thoroughness, and like him revoke their opinions and their ways. I am quite sure they would be conferring a great service to the public if they ceased to exhibit such attempts.

Besides the depressing specimens above alluded to, I saw several curious effects, one particularly so being that of a proposed moonlight effect, with a figure with an upheld parasol. It is curious, and I must decline to believe in the authenticity of that moonlight effect.—I am, yours, &c.,

Leicester, Oct. 8, 1894. DEFINITION.

CRACKED NEGATIVES.

To the professional a cracked negative is a serious thing. His negatives are valuable property, and it behoves him to handle them tenderly, stock them carefully, and if by accident any should be cracked or broken, to doctor them at once to prevent further trouble, and to have them ready for immediate service if prints should be called for. If the film has not been broken, the crack should be filled in with Canada balsam, and the plate mounted on a plain piece of glass to prevent strain and consequent spreading of the crack. If the plate and film have both been broken, lightly dust with a camel-hair brush to remove all small particles of glass, and then firmly bind the pieces to a second piece of glass. This may in some instances be done with gum-paper alone, but a better method is to stretch tightly over the surface a sheet of thin celluloid, turning the edges under and fastening the three, negative, celluloid, and plain glass, together with gum-paper. If this be carefully done, and the celluloid be tightly stretched, there will be no danger of any of the broken pieces becoming disarranged or slipping.—*Anthony's Bulletin.*

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange portrait lens, working *f*-5, covers cabinet, value 2*l.* 10s., Lancaster's whole-plate tripod, cost 1*l.* 1s., for violin, guitar, banjo, or poultry.—Address, W. HARE, Windsor Studio, Sutton, Surrey.

Wanted a pair of good stereoscopic lenses and shutter, in exchange for 12×10 mahogany square bellows, wet-plate camera, one single slide.—Address, F. JACKSON, 46, Elizabeth-street, Trafford-road, Salford.

I will exchange good old violin, with bow and case, for mahogany 12×12 studio camera by good maker, must have leather bellows, double swing back with single and double slides, or will exchange for Dallmeyer's 5D lens. Also wanted, in exchange for English concertina in good order, a 12-inch burnisher or hot roller by good maker.—Address, W. ILLINGWORTH, Rose Cottage, Harborough-road, Kingsthorpe, Northampton.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

"49."—G. Wheeler & Co., Manchester, will be sufficient address.

A. C. BALLINTINE.—The address of Messrs. Frith & Co. is Reigate, Surrey.

A. T.—1. The lens is a fairly good one, of French make. In a good light it would not be particularly slow. 2. A note to the makers of the plates will procure all desired information.

T. G. WOODROW.—Several formulæ for collodio-bromide emulsions will be found in the ALMANAC for the current year. You will, however, find wet collodion answer best for the character of negative you desire.

SENEX.—In the *Chemical effect of the spectrum* Dr. Eder, the author, gives, we believe, the results of the spectroscopic examination of chlorophyll. See also article in this JOURNAL for 1888 by Mr. Ives, page 390.

RALPH JONES.—If you were discharged without a reasonable cause, you are entitled to a week's salary in lieu of notice. Bad trade is not a sufficient cause for sudden dismissal, and will not be held as such in the County Court.

NIL DESPERANDUM.—We know of no such work, nor do we think any such is published. Most almanacs give the time of the rising and setting of the sun, and a map will enable you to determine at once at what hour it will shine in different directions according to the locality.

G. T.—Treat the negatives with a weak solution of cyanide of potassium after having removed the varnish. Some time ago Mr. H. N. King introduced a special solution for removing silver stains from gelatine negatives. Messrs. Marion & Co. are the agents, we believe, for its sale.

T. BRAIN.—Unless we saw some of the negatives we are unable to say how, or by what method, they were produced. The description is far too vague to give any idea whatever. Probably, as the one by whom they were taken has been dead so many years, they were produced by the collodion process.

PUZZLED.—We cannot account for the spots otherwise than by saying that they are caused by particles of pernicious matter in the paper itself, or coming in contact with the prints while they are in a moist condition. Send a few of the prints to the makers of the paper, possibly they may be able to explain the matter.

B. HUGHES asks "if gelatine reliefs (Woodbury reliefs) can be cast from in fusible metal or similar material."—Yes, very good casts can be obtained from in fusible metal or any plastic material. Spence's metal also has been used for taking casts from gelatine reliefs. It gives very sharp impressions. The "metal" is a compound of sulphur.

H. HARRIS.—If it is desired to employ the Ferrier slides for the lantern it will be necessary to first remove the ground glass with which they are backed. When this is done they answer very well, but not so well as slides made specially for the lantern. What is the best slide for the stereoscope is not the best for the lantern, and *vice versâ*.

ENLARGEMENT.—There is a kind of gold bronze varnish sold cheaply in small bottles at many oil and colour shops in London by which damaged gilt picture frames may be restored. We have used it for this purpose, and found it to answer quite well. There is also a preparation known as the World's Fair Bronze, which will answer well.

Q. W.—Some brands of ready-sensitised paper are very refractory in the toning bath, particularly with an old acetate bath. The best remedy we can suggest is, after the free silver is washed out, to pass the prints through a very dilute solution of carbonate of soda, and again wash them for a minute or two prior to putting them in the toning bath.

C. H. H.—In reproducing the music as a lantern slide to be sung during the entertainment it would, we expect, be infringing the copyright. Although the songs bear the intimation that they may be sung in public without licence, there is generally an announcement also to the effect that making manuscript or other copies of them will render any one doing so liable to penalties.

LUNA.—For enlarging by the electric lamp a focus-keeping lamp is necessary so as to keep the arc always in the axis of the condenser. For studio work (portraiture) it is not necessary, although some operators prefer it. Siemens supply a very good focus-keeping lamp. The Brockie-Pell focus-keeping lamp is also a good one. Others are in the market, and are well spoken of.

R. T. WATSON.—Farmer's reducer: saturated solution ferridcyanide of potassium, one part; hypo solution, 1·5, ten parts.

W. C. B. (Rugby).—The only way to be sure as to the copyright is to search the record at Stationers' Hall. We expect, however, it has expired. We can give no idea of the value of the original, not having seen it; better submit it to one of the leading print-sellers in London. If you send a copy of your reproduction to our office, together with 1*s.* 6*d.* in stamps, we will secure registration for you.

G. P. DOUGLAS.—From the description of the lens we feel no doubt whatever that, by opening out the fixed diaphragm to a considerable extent, the desired quality of softness will be obtained. By the insertion of a smaller stop the original sharpness can be regained at any moment. The softness is caused by the introduction of a small amount of spherical aberration consequent upon the enlarging of the fixed diaphragm.

BRIXTON.—There is no distortion in the picture and no fault in the lens, but in the judgment in working it. From its short focus for the size of the picture the perspective is very violent, and that is the only fault in the picture. Although the lens will cover the plate sharply, it is unadvisable to employ it when one of longer focus can be used. "Wide-angle" lenses should be avoided when medium-angle ones will suffice to include the subject desired.

T. BELL.—If you intend to attempt instantaneous pictures of the Lord Mayor's Show, you will need plates of the utmost speed, and a lens that will work with a large aperture. We are, of course, assuming that the weather will be as it usually is in the City in November. However, if it be exceptionally fine, under the conditions mentioned there is no reason why good results should not be secured. The only difficulty to be anticipated is the light at the time of the Show.

JAQUES GARDE says: "Would you kindly come to my assistance with a good and reliable recipe as to how to prepare dry-plate ferrotypes with extremely high sensitiveness? and which would be the most suitable, simple, and rapid developer for it? Or, in default, where could I obtain the latest book in which I could find the desired information to the above questions?"—In reply: Probably your best plan will be to employ the process for gelatine direct positives described by Lord Rosse, at page 357 of this JOURNAL for 1887.

SCRAPS asks: "1. Can you give me any hint as to heating a studio and a room at each end with hot-water pipes or otherwise, economical and effectual? The rooms are 18×9, and the studio 36×18×18 high at ridge. 2. What is the best and easiest used mountant for 12×10 scraps, to be pasted into an album?"—1. We can suggest nothing better or more economical than hot-water pipes as fitted in horticultural buildings, with a "Saddle" or similar type of boiler. Better consult a local horticultural builder. 2. A solution of gelatine, containing a large proportion of alcohol, such as given on page 895 of the ALMANAC.

S. W. A. writes as follows: "Having seen the 'living pictures' several time at the different houses, I have been struck with the large amount of light thrown upon them and their great brilliancy. It occurred to me that it would be quite possible to take instantaneous negatives of them with a hand camera. What is your opinion?"—Although the pictures as seen from the auditorium look very bright, the light is deceptive—the whole of the other part of the house being in darkness increases the apparent brilliancy. The pictures can, however, be photographed, but the exposure necessary, we suspect, will be longer than can be given with a camera held in the hand.

PROVINCIAL writes thus: "A local temperance lecturer a year or two ago obtained from a friend of mine the loan of a set of Hogarth's *Industrious and Idle Apprentice*, and had lantern slides made from them for his lectures. These slides he now claims to have made copyright. A little while ago I borrowed the prints from my friend and copied them as lantern slides for sale, and have sold several sets. The lecturer is now threatening me with proceedings unless I take them out of my window and stop the sale, as he says I am infringing his copyright, he having copied the originals before me as lantern slides and made them copyright. Have I infringed the law?"—Certainly not, unless you have copied the man's work, which you have not. He has no claim to any copyright in the original pictures, the thing is ridiculous. It is simply a case of "bluff."

*** Several answers to correspondents unavoidably held over.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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PHOTOGRAPHY AND THE MICROSCOPE FOR WINTER WORK.

The time is now rapidly approaching when the camera, for outdoor work at least, will be laid aside by many till next season. Although, however, outdoor work cannot be comfortably followed during the winter months, enthusiastic amateurs will, doubtless, be on the look-out for something to employ them in the fascinating art that can be carried on indoors. To all such we would suggest the microscope in conjunction with the camera. Photo-micrography can be carried on quite as well during winter evenings as at any other time, as artificial light is really the best for the purpose.

At a recent meeting of the Photographic Club (see report in last issue), Mr. Andrew Pringle—who may be termed *facile princeps* at photo-micrography—discoursed very completely on the subject, and described with great fulness the apparatus he employed in his practice. He also dwelt very strongly on the difficulties that had to be encountered with certain classes of subjects. From reading the report many might be deterred from taking up this phase of photography, on account of a supposed costliness of the necessary apparatus and the great difficulties there were in practice. Hence a few words on this point seem necessary by way of explanation. Mr. Pringle, with a view to instructing his hearers, dealt very fully with what may be termed the higher and most difficult branches of photo-micrography, and such as the ordinary amateur photographer would be scarcely likely to attempt. For this very advanced work somewhat costly appliances and considerable experience in their working are essential; but for such subjects as would probably prove more interesting to the average amateur than bacilli, flagellated organisms, and other medical subjects requiring the greatest magnification, costly apparatus is not at all necessary.

An expensive microscope is not required, as an ordinary "student's microscope," costing complete from three to five guineas, will answer every purpose; indeed, a microscope, although it is convenient to use, is not actually necessary, as what are called photo-micrographic attachments are now supplied by several apparatus-manufacturers at a small cost. This is a simple piece of apparatus that can be attached to any camera. In one end is screwed the object-glass, and at the other end is an adjustable stage to carry the object to be photographed.

For many subjects such as we would recommend the beginner to commence with, a microscopic objective is not at all necessary, as an ordinary photographic lens will answer every purpose; indeed, Mr. Pringle said, in his discourse the other night, for many objects an ordinary photographic lens will yield the best results, and he showed several examples of work done with it. By employing a photographic lens instead of a microscopic objective, the novice will not be troubled with a chemical focus, which exists in some low powers, particularly those of old construction. Photographic lenses of the symmetrical type can be had with as short a focus as two inches, and these will answer admirably for the larger objects. Some Continental opticians supply lenses of this type of still shorter focus. Some years ago small lenses of the Petzval form were made under the name of postage-stamp lenses. They gave exquisite definition, and had a focus of only about an inch and a half. With these lenses we have produced some very excellent work of the class that should commend itself to the beginner. These lenses are not, we believe, made now by our leading opticians. They may, however, be frequently met with in sets of four or more, second hand, for a small sum.

For the photographic part of the work any ordinary camera will answer, but, unless it be of very long extension, a lengthening cone may be necessary on the front. If a microscope be employed with it, a tube of cardboard, blackened on the inside, slipped on the tube of the instrument and projecting inside the camera, will suffice. When a microscope is used, it will be found convenient to have a stout board long enough to carry the camera and the instrument, the latter being fixed at one end. The board should have a couple of laths fastened along it, between which the camera can be moved backward and forward. By this means the axis of the whole system, when once adjusted, is maintained without further trouble. As an illuminant, an ordinary paraffin lamp does quite well with the usual condensers as supplied for the microscope.

It will now be seen that for what may be classed as the most popular subjects in photo-micrography, such, for example, as the tongue of the blow-fly, antennæ and wings of moths, minute insects, &c., no very costly apparatus beyond what the amateur already possesses is at all necessary; also that the difficulties to be encountered are by no means formidable to any one who is already familiar with photography.

There was one very valuable hint that Mr. Pringle gave to beginners that we would emphasise, namely, to commence the "practice on 'test objects,' as by them one could note one's own progress. They had another use too; if any one felt 'rusty,' let him go back to the familiar test objects." That is sound advice, which should be kept in mind by some who are more than beginners.

A DEALER'S COMPLAINT.

A leading dealer in photographic materials recently consulted us as to the cause of the prevalent imperfection in the chemicals and materials supplied to him. He was accustomed to the usual grumbling of inexperienced hands whose plates, chemicals, paper, and indeed everything they used were at fault, and not their want of skill; but lately he said there "must be something in it," for there was a "regular boom of grumble." We pointed out that at this time of the year there was often so much moisure in the air that difficulties were sure to arise in the drying of plates, tissue, and paper, that although the manufacturers nowadays, in the light of accumulated experience, were able to provide against difficult hygrometric conditions, there yet might be some cases where moisture in the air would explain everything. To a certain extent our interlocutor was satisfied as to the cogency of our suggestions, and departed in an unpleasant state of mind; but, upon further consideration, and after making sundry inquiries, we were ourselves less satisfied, because it occurred to us that, on the whole, the atmosphere had not been so specially overloaded with aqueous vapour as to lead to such broadcast imperfections. We think our later opinion is the correct one, and satisfies all the conditions. Although we have not had an excess of moisture, there can be no doubt that we have had a spell of cold weather, or great reductions of temperature in the night time.

Now, it is quite evident that, where special arrangements for keeping the chemicals at an equable temperature do not exist, they will, after the day's work is over, in the case of professionals, or almost at any time when only occasionally made use of, become so reduced in temperature as to act, apparently, in a manner quite different from their usual form.

First, let development be considered. The water from main has now a much lower temperature than it had a month or so ago; similarly with the developing solutions. Hence, unless a little warm water be added to the developing solution while mixing (and this is the exception rather than the rule, unfortunately), the plates, as the image now tardily appears, will be accused of being slow when a mere raising the temperature to about sixty-five degrees would show that they were in no ways deficient as regards sensitiveness. If those of our readers who may be amongst the grumblers referred to would try this simple expedient, they would probably find an immediate remedy, and by invariably adopting the plan during the coming winter at once put a stop to these complaints, and find a great help to comfort and certainty of results in their working. Those who have not adopted this expedient, which seems almost too simple to need referring to, will be surprised, in trying it, at the difference it will make.

But development troubles by no means complete the tale of difficulties; the albumenised paper sensitised at home exactly, as usual, refuses to tone. It is not so uncommon to find printers heating their toning baths, so that the same explanation will not here suffice, we may be told. That is quite true; but we do not find the silver bath, as a rule, raised in temperature during cold weather by the men who deem it well to warm up their toning solution; and it is here where the difficulty must be met. When a silver bath for floating paper is allowed to fall below its usual temperature, it is equivalent to reducing its strength; and every one knows what to expect if his printing bath is not strong enough. The simple remedy to be then applied, adding more "nitrate," is that needed for cold solutions. Let those who have lately experienced toning difficulties keep their silver solution and the dish that holds it in a warm place, and carry on the sensitising in a warm room, and their difficulties will mostly vanish. If to do this is impossible by reason of deficient accommodation, they must strengthen their silver solution by ten or fifteen grains of silver to the ounce.

These two points embrace nearly all the difficulties of the season, but it may be pointed out to carbon workers that if their tissue takes, as it very probably will at this time of the year, a day to dry, after sensitising, it will not keep long, and there will be a difficulty in keeping the high lights pure.

Fixing solutions also will be very cold now when newly made. The dissolution of hypo, under the best conditions, produces cold, and when the water employed is between forty and fifty degrees the solution, when completed, will not be much above freezing. It will then be unpleasant to work with, slow in action, and, if used in minimum strength and quantity, lead to fading prints. Warm water should always be used to dissolve hypo.

In conclusion, we may say that we think, if the requirements of conditions of temperature be duly weighed during the late autumn months, there will be an end to most of the dealers' complaints which we have quoted.

THE STAYING POWERS OF MODERN DEVELOPERS.

We spoke last week of the capabilities offered by modern developers of using the same solution for repeated or successive operations, but the capacity varies very considerably with different agents. With pyro, in the older days, the idea of developing a second plate with the developer already used for a previous one would never have been dreamt of; indeed, it was far from an unusual thing to throw away the first developer and replace it with fresh when exhausted on the same plate.

That was, however, at a period when ammonia held the premier, if not only, position in connexion with pyro, when, in fact, pyro-ammonia was practically the only developer for dry plates. We pointed out last week the reasons why this form of development did not lend itself readily to repeated use, and, when ferrous oxalate was first introduced, one of the first claims made in its favour was that it could be used over and over again until its strength was exhausted. So far as the mere capability of re-use was concerned, certainly ferrous-oxalate met the requirements to some extent, since it was not subject to any immediate change, such as occurs with pyro, in the way of discolouration and loss of power; but, although several films might be developed with the same quantity of solution, it could scarcely be said that uniform results were obtained, and, if put away after use, the solution very rapidly lost its developing action. In fact, the extremely rapid oxidation of ferrous oxalate, especially after once being used, unfits it for any purpose but the development of positives.

The first developer that seemed to offer any chance of success in repeated use was the "hydrosulphite" developer of the late M. Sammann, the formula for which was published in our columns in 1876. In this pyro was used in conjunction with hydrosulphite of sodium, formed by the action of bisulphite of sodium upon metallic zinc. This formed the first instance in which the preservative action of the sulphites or sulphurous acid was brought to bear upon pyro in solution; and, although the developer never proved to be a practically useful one, there is no doubt that the combination brought

out all the staying powers that pyro possesses, and, when some years later Mr. Herbert B. Berkeley put forward sulphite of soda as a pyro preservative, it was the means of turning many waverers from ferrous oxalate to pyrogallol.

But the more modern developers take an altogether different position in regard to keeping qualities. Pyro, preserved with sodium sulphite or with sulphurous acid, will, in concentrated "stock" solution, keep for a very considerable time—even years—without loss of power; but, when diluted for use, it discolours so rapidly that, though it may still retain some degree of energy, it becomes useless on account of its propensity for staining the gelatine film.

Hydroquinone, the next in chronological order of the new developers, is little better than pyro in the matter of keeping properties, for, though it does not discolour to the same extent as pyro, it does not fall far short, and, besides, loses its developing power with great rapidity. Of eikonogen we can say but little in this respect, though what experience we have had of its keeping qualities in solution, both before and after use, is not such as to lead us to say much in its favour.

Para-amidophenol and its hydrochlorate, on the other hand, are both what may be classed as distinctly "keeping" solutions, and in the form of rodinal we have kept this agent for considerable periods before use, though after it had been once used its strength departs rather rapidly, and it is not to be depended upon except for subjects and under conditions where the exposure has been ample.

Amidol is distinctly not a keeping developer, either before or after use. Even in concentrated stock solution with sodium sulphite it deteriorates or loses its power with some rapidity, and when diluted for use it is scarcely possible to develop more than a couple of films in succession with the same solution with any degree of certainty. Even if fresh additions of the developing agent be made, the extra bromide derived from the already developed films exerts so powerful an influence on the resulting image that no degree of certainty exists as to what will be the outcome of the operation.

Metol and glycin both present themselves in better form as developers, possessing staying powers both before and after use. The former especially, before use and in concentrated solution, appears capable of keeping for a really indefinite period, not only without discolouration, but absolutely without loss of power. We have tested a stock solution several months old, against a quite freshly made one, without discovering the slightest appreciable difference. Glycin, although it keeps well in solution, is scarcely equal to metol in that respect, as it slowly changes colour, though not to a very great extent. Its developing action does not, however, greatly vary with the slight change of colour.

In their keeping powers, after once being used, however, metol and glycin leave all other agents entirely in the shade, more especially the former. Indeed, metol seems incapable of losing its developing power except from sheer use. We have developed half a dozen half-plates with three ounces of solution with barely any change in its colour, and, after standing for a couple of days in the open measure glass, it has gone on developing without any apparent loss of power. Old used solution that has been bottled we have frequently used even for instantaneous exposures when it has been at least three or four weeks old. Glycin is nearly equal in keeping properties to metol though it discolours to a greater extent after use.

Curiously, in spite of the inferior powers of keeping of hydroquinone by itself, when mixed with metol, as in the formula given a few weeks ago, the solution preserves its original qualities quite as well as metol alone.

The Medal Harvest.—The Exhibition season probably reaches its climax in the month of November. Medals will be very plentiful this year. We have made a rough calculation of the number available next month in London with the result that over a hundred await aspiring competitors. Of the number quoted, four societies whose respective exhibitions open within the short space of nine days are responsible for over eighty. The heart of the medal-hunter must leap for joy at such a brilliant prospect.

Chrono-photography for Amateurs.—It has come to be looked upon as an acknowledged fact that the operation of taking a series of instantaneous photographs in rapid sequence of time necessitates the use of such costly and elaborate apparatus as to be beyond the reach of the amateur; but a recent number of *La Nature* contains a set of engravings from a series of such photographs, taken by a very simple apparatus, about seven by ten inches in size, and the size of the image and sharpness of focus is such as to render the photographs practically useful for ordinary requirements, besides the value they would possess for recording rapidly succeeding phases of motion.

A New Use for Formaldehyde.—We have on former occasions described the value of this substance for certain photographic purposes—unfortunately protected by patent—and now we learn from a paper read before the French Academy of Sciences that its vapour is very efficacious in sick-rooms. It is possible that a dilute solution might be serviceable in preserving mounting solutions not made of gelatine. It might also be valuable to seal up with photographs when framing to protect them from possible mildew. We may say that we have again this year noted the presence of this pest in a large number of pictures properly fastened up back and front to prevent the ingress of dust.

Sublimation of the Precious Metals.—In a paper recently presented by M. Henri Moisson to the Paris Chemical Society, he describes some remarkable results obtained by exposing various refractory metals to the heat of the electric furnace. It is, of course, well known that silver can be volatilised, but in the account we refer to the experimenter actually caused it to boil, and the vapour produced a number of small globules of metallic silver With platinum also, which comparatively few years ago could only be obtained in mass by a species of welding of white-hot particles, not only was it found to melt in a few seconds, but brilliant globules of the metal separated out of the vapour. It is possible that herein may lie the germs of a new mode of obtaining these metals in a state of purity.

Fast Colours.—It is often asserted that the cause of the rapid fading of the pink hue of prints on some makes of albumenised paper after exposing to light is due to the tinctorial agent being a coal-tar dye; but the report of the British Association Committee appointed to examine the action of the light upon dyed colours concludes with a sentence so negativing such a result being a necessary corollary of the use of these colours, that we here extract it. It is evident that, if the dye chosen be fugitive, there is no necessity for it, and that others of a permanent nature might be had if a little experimenting were carried out to discover the most suitable. The report says: "Our experiments have already abundantly proved that the popular opinion that the coal-tar dye stuffs include only such as yield more or less fugitive colours is entirely false; indeed, it is perfectly safe to assert that coal tar is the source from which the greatest number of colours fast to light was derived at the present time, and this seems to be specially true of the red and yellow colours."

A Hand-camera Club.—A common cry of the moment is that there are too many photographic societies in existence; especially in London and other large towns much difficulty is, we know, experienced in providing suitable subjects for discussion from year's end to year's end. This difficulty is increased by the fact that many societies

territorially "overlap" each other. Wherever possible, we always advise photographers to join and strengthen existing societies rather than start new ones, which in these times have little chance of success except in special instances. As to the formation of a hand-camera club, and without pretending to say whether it is called for or not, we can only remark that it appears to us that in the various existing societies adequate opportunities abound and are afforded for the discussion of anything relating to hand-camera work. Logically, if a hand-camera club is required, a stand-camera club; a single-lens club; a tripod club; a carbon club; a platinotype club; a pyro-ammonia club; a roll-holder club; a shutter club; are just as urgently called for, and might be started with quite as good a show of reason.

New Scheme for Treating Papers to be read before a Scientific Society.—The Physical Society of London has decided to make a departure of a novel kind. For some time past printed copies of the more important papers have been circulated before the meetings among members who are likely to take part in the discussion on them. It has thus been proved that previous knowledge of the contents of a paper promotes, instead of detracting from the interest with which the author's account of his work is heard and commented upon by the Society at its meetings. But the Council feel that cases may arise in which the author may wish that his paper should be published as soon as possible. They have therefore decided that, if an author so desires, and if such a course appears desirable, they will take steps to ensure that the publication of a paper is not in any way delayed in order that it may be read before publication, and that they will, if necessary, postpone the reading and discussion of a paper until after it has been published. It is further pointed out that the Council do not anticipate this new procedure will be frequently resorted to, but that they are willing to deal with exceptional cases in an exceptional way. There are many reasons for thinking that, if the first-named plan—that of furnishing a printed copy of papers to be read at meetings—were adopted by photographic societies, say, for instance, the Royal, their value would be greatly increased. Where a paper treats of a difficult subject on new lines, it is almost impossible to grasp the arguments and the facts adduced in support when hearing them read for the first time. Except to a very limited few, intelligent questions are then difficult to frame, and those elucidatory remarks that might readily be educed in a real discussion fail to be evolved. Further, such a plan would render more feasible the rule, which too frequently exists only on paper, that all papers to be read at a meeting should first be submitted to the Secretary or Chairman.

AMERICAN NOTES AND NEWS.

Multigraphy.—The multigraph, as we learn from the *Scientific American*, is a very pretty system for enabling us to see ourselves as others see us, and affording much range in the art of posing. If an image is placed in front of two mirrors inclined to each other at an angle of 90°, three images will be produced in the mirror; at 60° five images will be produced; at 45° seven images; and, if the mirrors are parallel, theoretically, an infinite number of images will result. Thus a number of different views of the same subject may be taken at one exposure. The person to be photographed sits with the back to the camera, while in front of the face are two mirrors set at the desired angle to each other, their inner edges touching. Our contemporary publishes several illustrations, in two of which we find the primary, or back, view of a lady's bust, together with four reflected views reproduced with equal distinctness. These latter show the head and face in profile and different three-quarter positions. We quite agree with the closing sentence that, simple as the process and idea appear, it might have many uses in the study of other forms of nature. We can even see in this a means by which an enterprising professional photographer may be able to give a substantial fillip to business. The prime cost is only that of the pair of mirrors. Mirrors have been employed in, and recommended for, photographic purposes long ago. We have been incidentally informed that multigraphs have "caught on" in New York and other American cities.

Lantern Amenities.—When we noticed in a New York journal a side fling at the editor of another transatlantic magazine for alleged delays and other inefficiencies displayed in connexion with a lantern exhibition at the late Convention of the Photographic Association of America, we expressed a desire to hear the other side. This the *St. Louis and Canadian Photographer* permits us to do. Compressed into a nutshell, it amounts to this: The gentleman in charge of the entertainment, being busy elsewhere, did not turn up at the proper time according to promise, and our St. Louis brother superintended the putting up of the screen, a twenty-five foot one, and placing the lantern before the hour of meeting. He then made an unsuccessful search for a lanternist, returning to the hall after the exhibition should have been on, and, in the absence of the person in charge of the entertainment, and not wishing it to prove a disappointment to those assembled, did his best to run the show. If there were any hitches under these extemporised circumstances, it is only what might be expected to occur, and usually do occur, even with the most experienced lanternists, and nothing but gratitude can, or should, be felt towards any gentleman who thus stops a gap.

A Gigantic Tour.—We have had the pleasure of a visit from a photographer of world-wide renown—Mr. W. H. Jackson, of Denver, Colorado, U.S.A., who is at present in this country. Mr. Jackson is Official Photographer of a Commission appointed in the interests of the Field Columbian Museum of Chicago, and, along with six *confrères*, representing the army, navy, art and science, is now *en route* for Gibraltar, thence to Algeria, Egypt, Arabia, Turkey, Persia, Hindostan, Ceylon, China, Corea, Japan, several of the Pacific Islands, the East and West Coasts of Africa, New Zealand, and Australia. About two and a half years are to be occupied on this trip. Six months will then be spent in Europe, when they will proceed to the extreme limit of Russian railway construction towards Behring Strait. They expect to return to America some time in 1897. Besides ordinary cameras, with which he will use films, Mr. Jackson has with him a No. 4 Junior Kodak. The revelations which will be made of the far-off places of the earth's surface must prove of inestimable value.

During his visit, Mr. Jackson has shown us some of the most remarkable panoramas we have ever seen. He makes them by joining together 22 × 18 negatives, one picture, *Ouray, Colorado*, being formed of four of these, with junctions so perfect as to render it well-nigh impossible for even the artist himself to point them out. This picture exceeds seven feet in length, and is, of course, on a single sheet of paper. In a similar picture, this being an architectural subject, *The Ponce de Leon Hotel, Florida*, the perspective lines have been so well rendered as to make it difficult to believe that the perspective is of what we once designated the conglomerate order, or a panorama composed of a series of plane-perspective photographs.

Aluminium *versus* Magnesium.—It is predicted by a writer in the *St. Louis and Canadian Photographer* that, as electricity will finally supplant steam, so will aluminium become a substitute for magnesium in flashlight photography. Its chief advantages are its higher activity and its freedom from objectionable odours on ignition. We are rather inclined to demur to this, for, if the magnesium powder be used without any foreign admixture, there is no objectionable odour apparent. We quite grant the abundance of smoke, but this usually finds its way upwards and deposits on the ceiling of the room in which it is burnt; while, as for the higher activity of the aluminium, this, we think, has not yet been quite proved. But, if the two metals are even on a par in this respect, photographers will rejoice in having more than one string to their nocturnal bow. We quote once more from Mr. Hegyessy: "It is

said that commercial aluminium bronze powder can be used if all the grease be removed by the application of heat. The consequence of allowing the grease to remain is that the powder adheres in lumps and a large proportion of it escapes ignition when blown through the flame. Another advantage possessed by aluminium over magnesium is its resistance to oxidation when in fine powder."

Professor Glasenapp recommends the following mixture for photographic work: Aluminium powder, 21·7 parts; sulphide of antimony, 13·8 parts; and chlorate of potash, 64·5 parts; all these by weight. Precaution should be taken in mixing these.

ROYAL PHOTOGRAPHIC SOCIETY.

President's Annual Address.

When, a few years ago, the Society's laws were under revision, I was one of the committee appointed by the Council to draft the new laws, and some evil spirit prompted me to suggest the regulation that one of the duties of the President should be the delivery of an annual address. Had it occurred to me as within the bounds of possibility that I might one day fill the position whose responsibilities I so lightly increased, I should have been more considerate. Perhaps I am rightly punished. Having digged a pit for others, I have fallen into the midst of it myself.

And indeed this duty of addressing you to-night, like the other duties attaching to the Presidential chair, is made far more onerous by the fact that its present occupier succeeds the one man living who is best qualified to fill it. Following Captain Abney, I have always felt like that President of the Royal Society of whom it was said that,

> "If e'er he chance to wake in Newton's chair,
> He wonders how the devil he got there."

Nobody was ever better fitted to be President of our Society than Captain Abney; nobody has further advanced our science, or conferred more lustre upon it; nobody has better served the Society of which he is not only the most distinguished but also the most useful member.

To follow one so eminent seems to emphasise one's own incapacity My only consolation must be that you are as conscious of the position as myself; that, under the circumstances, you will not look for very much, and that therefore you will enjoy that modified beatitude which falls to the lot of him who, expecting nothing, is thereby saved from disappointment.

Perhaps the least noxious form of a Presidential address is the one in which the writer, selecting some specific subject of which he is a master, dilates upon it. This form of address is the more meritorious as it is least Presidential. In its best shape it may approach the dignity and utility of a paper read at an ordinary meeting. Reasons upon which I prefer not to dwell prevent my adopting this form. A less ambitious President must content him with the humbler, but, I trust, not wholly valueless sort of address, in which opportunity is taken to take stock of recent progress and review the advances which have been made in the twelvemonth or so before the date of his occupancy of the chair.

Before, however, attempting to deal with general matters—and it is only a few very brief notes that I propose to offer to your attention—I should like to say a few words about the condition of the Society itself.

The Position of the Society.

We have lately been fortunate enough to receive what I think all members of the Society must consider a very high compliment, the permission to entitle ourselves the Royal Photographic Society. Now, it would be idle to pretend that any alteration in the name of a Society can affect the value of the work it does, or give the Society itself a position to which its work does not entitle it. The real value of the distinction which has been granted us is that it is a recognition, from the highest authority in the Kingdom, of a long and useful career. It marks the attainment of an honourable position, and it will, I trust, influence our members to use their utmost endeavours to increase the reputation of which it is the official acknowledgment.

I do not know whether, when the Photographic Society of Great Britain was founded in 1853, at a meeting which you will pardon me for reminding you was held at the Society of Arts—I do not know whether it had any rivals in this country or abroad. Nor do I know—I doubt if anybody does—how many, I will not say rivals, but kindred societies, the Royal Photographic Society has at the present moment.* Many of these sprang directly from the parent Society. I suppose most of them originated more or less directly from it, and a very large number (at all events of those belonging to our own country) are intimately associated with it in the important and growing Association of Affiliated Societies.

That there should be so large a number of societies all dealing with the same subject-matter is at once a source of strength and weakness to us; of strength, because it adds to the number of those to whom we may look for support, and of weakness, because it diminishes the number of those who would naturally subscribe to our funds had they not a prior claim. I cannot but regard it as a matter for regret that so many other societies have arisen in London, all with very much the same objects as ourselves. It is, however, now too late even for regret. They exist and flourish, and nobody could wish them to do anything else. Perhaps in times gone by a little more vigour on our part might have anticipated the need for their existence; but, as circumstances now are, we can only do the best we can to work harmoniously together for the good of the science and the art for whose benefit we were instituted.

Years ago, in the early days of the present century, the great Royal Society was in a similar position. As science grew and specialised, special societies sprang up around it; the Linnean, the Geological, the Astronomical were all established within a short period of one another, and it was predicted that the old Royal Society had had its day, and that it would soon have to submit—reversing the Saturnian legend—to be devoured of its own children. Nothing of the sort, however, happened. The ancient Society held its own, the prognostications of the prophets of evil came to nought, and at the present moment the Royal Society of London is the most powerful, the most respected scientific body in the world.

So, too, I hope it may be with ourselves, and whether it is so or not must rest with the members. It appears to me that there are two special directions in which the energies of the members ought to work. We want to increase our numbers because it is only by such increase that the necessary funds can be provided, without which no work, however useful, can be carried on, and we want to do good useful work in the promotion of either the scientific or the artistic side of photography, as our individual tendencies may incline us. Looking back on the history of our Society, we have a record of which any similar association might be proud. Founded in the days when photography was in its infancy, we have nurtured it, and have done our full share in bringing it to its present position. The pages of our Transactions are the records of the growth of the science; the walls of our Exhibition, year after year, have illustrated the growth of the art. There has been no advance in either direction that has not been fully exemplified in the Exhibition, fully discussed and recorded in the *Journal*. We of to-day have but to follow the example of our predecessors, only remembering that our task is harder because progress is more rapid nowadays, and that greater energy is needed if we intend to keep abreast of the so speedily advancing wave of knowledge.

When there are available so many channels of publication, so many opportunities for discussion, it is more difficult than ever to secure good material for our meetings; but it is certain that the higher we can raise the standard of our papers, the more easy it becomes to get good papers, and so, the more successful we are, the more easy success becomes. I feel myself that the Royal Photographic Society ought to occupy towards the allied bodies the same position that the Royal Society holds to the other scientific societies, and that every advance in photographic knowledge ought, as a matter of course, to be brought before it just as every important advance in general science is recorded in the Philosophical Transactions, whether or no it comes before the special society, Chemical, Physical, Astronomical, or other, with which it is directly concerned.

More Funds Wanted.

And, if we are not only to maintain but to improve our position, it must be by the sympathy and help of the general body of members. We are fortunate in having a most able and energetic Honorary Secretary and a most efficient Assistant Secretary, but you, the members, must not leave it to the officers, or even to the Council to do the work of the Society; you must interest yourselves in it, or the work will not be well done.

And now let me recur to the question of funds. I think we must admit that our resources are well administered; but it is certain that, if they were more abundant, we could better fulfil the objects of our existence. With a more convenient meeting-room we might expect larger meetings; with improved facilities for demonstration we could give more

* Mr. Traill Taylor in his admirable Almanac enumerates 238 British societies, 21 Colonial, 22 Continental, and 109 American, a grand total of 390.

attractive papers and lectures; with a better laboratory we might hope to afford opportunities for genuine photographic research; with an available gallery we might have constant and varied special exhibitions; with more convenient library accommodation we could make our excellent library more serviceable than it is. Unfortunately, we have, and can expect to have, no other sources of revenue than the contributions of our members. At present these, as you know, barely suffice for our needs, and, in your own interests and in the interests of our common objects, I feel myself justified in making an earnest appeal alike to the members of the Society and to the photographic public generally to assist in enlarging the usefulness and the influence of the Society by adding to its numbers.

That our claim is justified, and that we ought to receive more assistance than we do, not only from those interested in photography pure and simple, but from students of the many other branches of science who have received help from our particular branch of science, is, I think, a view of our position which our members might do well to bring before their scientific friends.

The General Condition of Photography.

Turning aside from the consideration of the affairs of our own Society to the general condition of photography, we find cause for nothing but congratulation. It is not so very long since photography occupied a very subordinate position in the world alike of science and of art. Scientific men looked on photography as a mere art, artists regarded it as a mere science. About twenty years ago, when I suggested that some improvement in a photographic process—I forget now which—ought to be brought before the Physical Section of the British Association, I was told that there was nothing scientific about photography, that it was a mere empirical pursuit, unworthy the attention of serious students of science.

And to a large extent the reproach was well deserved. Though the list of the earliest workers in photography contains many illustrious names, yet it is true that a large proportion of the most important contributions to photographic knowledge were not made by scientific workers or by men who worked in scientific methods. They were obtained by practical men, seeking for results, often, indeed, seeking for them successfully by methods which would not have commended themselves to men better equipped with scientific knowledge. Of course, this was the consequence of the fact that photographic science was early associated with photographic practice, and the same remark holds good of other sciences—electricity, for instance—in which theory and application to practical use advance with equal steps; but I think it applies more to photography than to any other.

At the present time we have indeed reached a very different condition of things. All the most striking of the recent advances in the science are the result of elaborate scientific research. The most recent improvements in lenses were the fruit of long and laborious investigation into the optical properties and the chemical nature of certain sorts of glass. The increased speed of modern plates, and their improved power of rendering colour values more truly, have only been obtained by minute knowledge of the condition of the problem to be solved, and by careful application of the most recent results of chemical and physical research. If the old photographic crux, the reproduction of colour, has been solved, or, at all events, if a possible method has been indicated for its solution, it was not by hap-hazard experiment, but by careful adjustment of means to secure an anticipated result. Nowadays, we can only hope for improvement by utilising the advance of scientific knowledge.

But, if the present position of photography is due to progress in the kindred sciences, how amply has she repaid the debt! There is not a single branch of science in which photography is not largely used. There are many whose progress is now absolutely dependent on the power of the camera to observe more accurately, more independently, more minutely, more rapidly, more permanently, than the human eye. If, as appears to be the case, we have reached the limits of human vision, aided by the most delicate instruments that can be constructed, it is difficult to imagine what limits need be set to photographic vision can we but construct instruments of accuracy sufficient to allow its full powers to be utilised.

Scientific Applications of Photography.

I imagine that the first application of photography to a scientific purpose must have been when Dr. Draper, in New York, photographed the moon. Whether the pictures he obtained were of any astronomical value, I do not know; certainly those taken a little later, in 1852, by Dr. Warren De la Rue, were, and they were the precursors of the long series of astronomical photographs culminating in Dr. Common's nebula of Orion, and in the great work of charting the heavens by photography, which is now in progress.

The advantages of the "retina which never forgets," and, it might be added, which never tires, which accumulates weak impressions, and stores them up till they become one strong one, were long since recognised by De la Rue, and I suppose it will not be very long before, for astronomical purposes, eye observations are entirely superseded by photographic. The photographic camera is now an indispensable adjunct to every large telescope, if, indeed, it would not be equally correct to say that the telescope is an adjunct to the camera, since the astronomical telescope tends more and more to assimilate to the form adopted long since by Mr. Rutherford, in which the visual rays are treated as of but slight importance, and the chief attention is given to the accurate utilisation of the more chemically active rays at the violet end of the spectrum.*

In his recent address to the Photographic Convention at Dublin, Sir Howard Grubb, than whom nobody is better qualified to speak on the subject, dwelt on the services which photography has rendered to astronomy, and gave several striking illustrations of those services. Indeed, if one not qualified to speak on such matters with any authority might hazard an opinion, it would almost seem as if the power of recording observations had already outstripped the capacity for examining the observations and drawing conclusions from them. When we are told that a photographic plate has recorded 10,000 stars in an area not containing a single visible star, one may be excused an expression of wonder as to how the human mind is ever to grapple with problems of such infinite complexity, to turn to useful account observations dealing with such enormous multitudes.

But, if the telescope has lately become one of the most important of photographic appliances, the spectroscope may be said to have held that position almost since its introduction. Professor Norman Lockyer, in his well-known text-book,† attributes to Sir John Herschel the first suggestion of spectrum photography, and we find that in 1839 he pointed out that the way to investigate sensitiveness was to photograph the spectrum. In the following year he read a paper describing his results of spectrum photography. A little later, in 1842, Becquerel and Draper were both at work photographing the solar spectrum. Twenty years later (in 1864) Miller was turning to practical account the power of photography to record the parts of the spectrum beyond the limits of human vision, and from that date nearly all spectroscopic work has been photographic work. Whether applied to astronomical observation or chemical research, the spectroscope has always been combined with the camera, and it is by the combination of the two instruments that such wonderful results have been attained. And, as photographic methods have improved, so have fresh facilities been afforded to the spectroscopic worker. Norman Lockyer's earlier work was of necessity done with wet plates, but with the plates now available he is producing star spectra on a scale comparable with the solar spectra of twenty-five years ago.‡ Rutherford's recent maps of the solar spectrum could not have been produced without the use of colour-sensitive plates, while, in one of the most recent attempts to employ spectroscopic analysis for purposes of practical metallurgy,§ Professor Hartley tells us that he also used orthochromatic plates, specially prepared, and that, after trying various developers, he found hydroquinone the best.

As an automatic recorder of scientific observations, photography seems to have been utilised in the Royal Observatory about 1847, under the superintendence of the venerable ex-President of this Society, Mr. Glaisher, who has been kind enough to furnish me with particulars of the methods originally devised by Mr. Charles Brooke, and successfully worked for many years by Mr. Glaisher and his staff.

The method was first applied to record magnetic variations and the movements of the barometer and thermometer. In the case of the former, a ray of light reflected from a mirror carried by the magnet was focussed on the surface of a cylinder covered with sensitised paper.‖ The cylinder was rotated by clockwork, the result being, of course, in the way now commonly employed for such automatic records, to give, when

* A good illustration of the telescope of the future would appear to be the twenty-four-inch photographic refractor, with an eighteen-inch visual telescope, now being constructed, at the expense of Mr. McLean, for the Cape Observatory.

† *Studies in Spectrum Analysis.*

‡ "Photographic Spectra of some of the brighter Stars." *Phil. Trans.*, vol. clxxxiv. (1893), A., pp. 675 *et seq.*

§ "Flame Spectra at High Temperatures." *Phil. Trans.*, vol. clxxxv., A., pp. 161 *et seq.*

‖ The method employed was a form of the old calotype process. Paper treated with potassium bromide and iodide was afterwards sensitised with silver nitrate. The development was by gallic acid.

the image was developed, a record of the movements of the magnet. A base line was given by an invariable spot of light, and by intermissions of this light a time record was provided. Similar results were obtained in the case of the barometer by using a float with a small perforation through which the light passed, and with the thermometer by simply allowing the mercury itself to screen the light from the sensitive surface.*

Later on, in 1865, similar means were used by Mr. Glaisher for the automatic record of earth currents, and they have consequently been continuously observed since that date at Greenwich.

To the best of my knowledge, but little alteration has been made in the original system, the only improvement being in the sensitive surface employed. When gelatino-bromide paper was introduced, it was tried and adopted at Greenwich, and by its means superior results were obtained.

I have ventured to dwell at some little length on this part of the subject, not because what I have said can be novel to any of you, but because I think this first application of photography to automatic observation has considerable historical interest, and also because this application was carried out by one so long and so honourably connected with this Society.

The principle thus first applied at Greenwich has received numerous other applications, and, indeed, it is now a matter of course that photographic methods should be used to register the movements of any instrument of whose indications it is desired to preserve a record. Instances are, of course, numerous in which no other method is possible. Hardly any but a photographic method could register the movements of the light spot of a reflecting galvanometer and thus enable the physicist, who, like Langley, is measuring the heat radiated from celestial bodies, to record the minutest differences of temperature; the chemist, like Dewar, who is producing hardly imaginable cold, to record temperatures approaching absolute zero; the metallurgist, like Roberts-Austen, who is dealing with the melting points of metals; to register by a photographically traced curve variations in high temperatures, which but a short time ago could not be accurately measured at all. It is interesting to read the testimony of the last-named, given at the last Conference of the Camera Club, to the effect that he could not conceive of any method which would give such results in the same space and time. Equally interesting is it to note the Professor's suggestion for a practical method of recording continuously the temperature of the air supply of a blast furnace, a matter of great importance to the iron-manufacturer, of which he says, "If we had no photography, it would be impossible to get a record which would be anything like so true."

Numerous other instances will occur to many of you in which photography has been, or might be—indeed, I may say will be—applied to similar purposes. I will only refer to one, because it appears to me so excellent an instance of the delicacy of the method. At the last—the Oxford—meeting of the British Association, Mr. Burch showed to the newly formed Physiological Section photographic records taken with the aid of the capillary electrometer of electrical currents produced by speaking into the telephone. The letter z produced a complicated curve in which oscillations of current lasting only 1·3000 second were visible with a lens.

It seems hardly worth while to trouble you with the details of many of the other services which photography has rendered to science, and if I were to attempt to produce an exhaustive list, there are many present to-night who could supplement it out of their own knowledge. The meteorologist has been enabled by its aid to study the form and nature of clouds, the shape and character of the lightning flash. The zoologist has been taught much about animal motion. The microscopist has long learnt to rely on the camera as the only accurate means of reproducing the objects of his studies. The physicist has, by photographic methods, investigated many phenomena in which the changes are too rapid for the human eye to follow them. By such means Lord Rayleigh and Professor Boys have obtained long series of pictures of occurrences which all took place within a fraction of a second, thus almost analysing time as the chemist analyses matter.

The uses of photography in ethnology, geology, geography, natural history, archæology are too obvious to need mention. They and many other applications may be summed up in the remark that, whenever the observer of natural phenomena requires to make an accurate record of his observations, photography supplies the means. It also supplies the means of showing to a room full of spectators what could otherwise be seen by but a single observer at one time, and has thus rendered to the popularisation of science no less a service than it has lent to its advancement. This universal use of photography for purposes of demonstration must certainly not be forgotten in however brief a summary of its applications.

(To be concluded.)

* For a full account of the apparatus reference may be made to an addendum to the introduction to the Report of the Astronomer Royal.

CLOUD NEGATIVES: HOW TO TAKE AND USE.

[Photographic Scraps.]

The best way of taking and using cloud negatives is to take he clouds on the same plate as the view, and print them in the ordinary way without any more ado. This may sound very offhand, not to say flippant, but nothing of the kind is intended, as I shall presently show. It would be idle to discuss the question of clouds or no clouds in landscape photography, but this much I may and shall discuss, viz., the degree of cloud we should judiciously introduce into our work. From blank white-paper skies we have, many of us, gone to the opposite extreme, and, now that the introduction of clouds into photographic paper prints is a comparatively easy matter, many photographic publishers have adopted the policy of giving the public plenty for their money; whether they have not overdone it may be a matter of opinion.

Before I go any further I must at once say that, in my opinion, this sort of thing has been much overdone. I am one of those who think that clouds in photographs should be very delicate, lightly printed, suggestive rather than aggressive, and should always be in character with the general illumination of the view. I am sure I need not recapitulate much that has been complained of by various writers and critics who have dealt with the subject of cloud photography in relation to their introduction into pictures. In paintings there are innumerable instances of where the skies and clouds have been the very making of the pictures, but this can scarcely ever be so in our present method of photography: monochrome does not speak the same language as colours do; therefore, if a painter and a photographer could rapidly reproduce a given sky, it might, and probably would, end in the former presenting us with something beautiful and glorious, whilst the effort of the latter would be meaningless and inartistic. This brings me back to my previous remark about photographic clouds being delicate and suggestive, and never assertive. In saying this, I have no desire to cram my own opinions down the throats of my readers; it is not a hastily formed opinion, but I am backed up by that of a number of able art critics whose judgment is worth considering, and, although it may seem somewhat personal, I will give an example of what I mean. Not very long ago I was requested to photograph a smart launch on the Thames. I made a very nice picture of it; the clouds were there, light, delicate, and suggestive. The owner took the launch away, and when next I saw him he told me he had had it photographed again by a "crack" artist, who made a speciality of that work, and the photograph had got "such grand clouds in it!" Naturally I was a little curious to see this great production. When I did, it gave me quite a start; as the ladies would say, it gave me quite a "turn!" The launch was taken right enough, with a dark background of willows and similar river-bank shrubs; but the clouds—well, they were there and no mistake! They were sharply defined, much too sharply defined, and they were printed just about as dark again as I should have left them; but, worst of all, they seemed as though they were but a few yards beyond the willows, and almost resting upon them, the whole effect being to convey the impression that the clouds were alarmingly near. Now, this came about by two causes: the clouds had been taken on a separate plate by a lens much longer in focal length than that with which the launch was taken; and this gives me the opportunity to remark that, whenever clouds are printed in to skies from separate negatives, such cloud-negatives should always be taken with a lens of the same focal length as that used to take the view.

The two exaggerations of cloud effect I have just described will explain how easy it is to fall into errors which may be inartistic or even vulgar. Had the "crack" artist contented himself with light and suggestive clouds, his picture would have been less open to criticism, and his client probably none the less gratified. I should consider it a questionable direction in which to lead popular taste by giving them pictures with exaggerated or impossible skies. Elaborate and exaggerated retouching has now come to be condemned, whilst most consider a little retouching is an improvement; so a similar remark may apply in the matter of clouds.

I come now to an explanation of the opening sentences in this article. It is quite easy, under given conditions, to secure the clouds in a view negative that will print themselves at the one operation. As I write, I have just passed through my hands a number of negatives taken in a hand camera for purely experimental purposes. The subjects are such as were well lit, but with foliage, and the exposures were necessarily brief. In all of them the clouds have developed with good contrast, and the density has not become too great to prevent the printing through of the clouds simultaneously with the rest of the view. As may be inferred, the exposure of the plates in each instance having been rapid—I said they were taken with a hand camera—the sky did not receive the abnormal exposure which would be the case if the negative had several seconds. This short exposure, sufficient for the view, was not too long

for the sky, hence the clouds are rendered, and the sky not over-exposed. It has long been the experience of workers who pursue instantaneous photography that very frequently the clouds, if there are any, are generally visible in the negative, but usually the whole sky is much too dense to allow any indication of clouds to print through. Occasionally, and generally quite unexpectedly, the clouds will be rendered in a remarkable manner. Inquiry into the causes which may have operated to bring this about does not always quite explain satisfactorily the result. I have myself traced it to the conditions of light and atmosphere prevalent at the moment, such as when we have a remarkably well-illumined view, with clouds set in a sky not very actinic in itself; I have furthermore traced it to a property in the emulsion, and I have, like many others, felt convinced that the shutter used played an important part in the rendering of cloud skies. It has generally been conceded that certain forms of shutters have distinct influence upon the rendering of sky and foreground respectively. Such shutters as begin the exposure, during their slowest motion, by opening the lens to the foreground, then reaching the sky and returning to rest by closing over the foreground—or, in other words, giving the maximum of exposure to the land and the minimum to the sky—have usually been credited with the best results in the direction sought. But, singularly enough, this by no means holds good in practice. I have, by the use of the simplest form of drop shutter, obtained very good cloud skies, with printing value on the same plate as a well-exposed land or seascape. Yea, furthermore have I obtained equally satisfactory results with a form of shutter which accorded in form with neither of the foregoing, for I will now say that the hand-camera negatives mentioned above were produced by a shutter which is a disc, and begins the exposure at one side and finishes it at the other. These things are subversive of theory, or, perhaps, more correctly speaking, are contrary to our expectations, and, whilst giving full consideration to the question of the best form of shutter to secure clouds in the same negative, we must also admit that the light, the atmospheric conditions, and the duration of the exposure have much to do with the success of clouds on the same plate as the view. I wish I had space wherein I could explain some of the conditions essential, but I have not at this time, and I must therefore treat of another phase of the subject.

Up to now I have dealt with the question of securing clouds on the same plate as the view with a short exposure. There arises, however, one or more sides to this same issue, viz., the absence of any clouds at the time of photographing the view, or the necessity of prolonging the exposure so much to secure the view that all the visible clouds are developed many times too dense to have any printing value, if, indeed, they are not entirely obliterated in a dense sky. Well, if the clouds are not present, you cannot photograph them. There are many times when the photographer must take his picture when the sky is cloudless or a blank, just as there are days and weeks, and even months, during which clouds are faint or entirely absent. A long continuance of cold easterly wind will render the sky cloudless, just as south-west winds, coming off the Atlantic charged with moisture, will bring us piles of the grandest clouds any one could wish. If clouds are absent, or if the exposure must be too long to secure clouds, then we must resort to other means. There are several; cloud negatives may be taken at any time when the necessary conditions are favourable. When I photograph clouds, I usually go to the highest room in the house; erect your camera at the open window, and focus so that you just include the tops of the trees or the very tops of the chimney-pots in your negative. There is one great advantage in this, as you will then never use your cloud negative upside down. Focus for the clouds, or even for the chimney-pots, then turn on *f*-45 or *f*-64. Put an Ilford "ordinary" plate in your slide, give it a cap off and on, or about half a second, and go and develop. Use a weak developer, and watch very closely; the clouds, the white parts, should show in ten seconds, and should come up pretty strongly, leaving plenty of quite clear places which represent the darker parts, and this contrast should remain to the end of development. You can make this trial at the cost of one penny, on a quarter-plate, and a very few trials will tell exactly the right exposure to give. After ascertaining this, you can take larger sizes to suit the largest plate you work; indeed, large cloud negatives are best to have, because you can print the clouds on to smaller prints from different parts of the large negative. By the use of iso plates you get even a better effect than with "ordinary." At my elbow I have some cloud negatives; they are marked with the date, "iso, *f*-64, three seconds with pale yellow screen," and one I see is marked two seconds, which was for very bright clouds. I have photographed clouds on usual plates with a yellow screen; one such negative is marked "Ilford rapid, with screen, *f*-64, three seconds," but it is not so good as those on iso plates similarly treated. As nothing will so well give one the necessary knowledge as experience, I recommend trial on different plates with varying exposures on clouds of divers form and illumination; a dozen plates will be sure to yield some good negatives, and the experience will be cheaply obtained. It is impossible to describe accurately the qualities essential in a good cloud negative. Cloud negatives should always be clean and thin.

Careful note should be made, by scratching on the edge of the negative, of the date, the aspect, and any remark, if the memory cannot be trusted. I have cloud negatives in which the horizon or tops of trees appear, and this establishes the locality, and I know to within an hour or so when they could be taken, and the then direction of the light; but, if any one else handled them they, would not know, in the absence of any memoranda or data on the negative. The main object of such memos. is to prevent the improper use of cloud negatives, such, for instance, as a view lit from the right and clouds lit from the left.

One other method adopted is to take the view in the ordinary way, then to take a cloud negative immediately after or before; the cloud negative may then be on an iso plate and the view on an ordinary. This is assuming, of course, that there are clouds to be photographed. The view negative is developed in the usual way—dense sky just as it likes to come; then the cloud negative, from the identical position, will have the same outline of trees, or houses, or steeples, or what not, and there will be less trouble in the subsequent use in printing in. Suppose we have such a pair of negatives, we print the view first, it leaves a pure white sky; we then remove the print, and place it on a cloud negative in another printing frame, and expose to light, shielding the already printed view portion in any way, such as with a soft opaque cloth or a cut-out mask of opaque paper, which conforms fairly to the outline of the horizon. In printing the clouds in, it does not matter that we should mask very accurately, for, if ordinary care be used, the joining or overlap will not show, except in some cases, such as, for instance, very faint distance, or where, as I have seen, the clouds were actually allowed to print over the pure white sail of a yacht! A white church spire also looks very bad with a cloud floating across it! The masking may be done by holding the printing frame to the light in the left hand, and with the right hand sliding a piece of stout cardboard to and fro just about the horizon line of the view; this will melt the clouds into the horizon in the majority of cases without showing any break. I have seen masks made of thin red blotting-paper, the contour of the horizon being traced through in lead pencil, then cut out, and the fibres of the paper scratched up with a needle, so that the outline gave a fluffy kind of edge which, when placed between the print and the cloud negative, softened the line of junction admirably.

There are so many methods in vogue that to describe one-half would consume all one issue of *Scraps* in its new frock. I may, however, mention one which has recently been advocated for taking clouds on the same plate as the view. When about to develop, use a weak developer just to get out the sky; when this is quite out and the horizon line clearly marked, wash off the developer thoroughly, and then paint all over the sky with a strong solution of any bromide. Then renew the development in the ordinary way; the bromised sky will be restrained more or less, and the clouds may be retained with printing value.

In the use of cloud negatives, or negatives of views with clouds in them, the new papers such as P.O.P lend themselves admirably to the retention of clouds much better than did albumen papers, because over-printing is not carried to the same extent as was formerly. I have several negatives with clouds in which would print on albumen paper, but, when the prints came to be toned and fixed, the clouds were gone, the bleaching action having removed the faint clouds. P.O.P., not requiring such deep printing, retains the weak impressions better, or, at least, that appears to be the case.

Cloud photography is very interesting; when one is engaged in taking clouds, the beauty of the forms of some are so very grand that one is tempted to watch the changes and secure them as they occur. I have exposed six plates in about as many minutes on the same group of clouds, which in their motion brought fresh combinations into effect very rapidly. It is quite worth while to endeavour to secure a dozen or two of good cloud negatives.

TECHNIQUE.

THE SALON CONFERENCES.

REV. F. C. LAMBERT ON "HOW TO LOOK AT PICTURES."

"THESE evenings," said Mr. Lambert, with charming candour, at the end of a two hours' talk on art at the Photographic Salon, on Wednesday evening, October 11, "are a pleasant way of boring each other." In justice to the speaker, it must be said that he himself is by no means a disagreeable bore. Major J. Fortune Nott occupied the chair on the occasion of Mr. Lambert's discourse, and there was an excellent attendance, which included several ladies.

Contrary to general expectation, he did not take the pictures on the walls as the bases of his observations. He explained that, though he was going to be generally cantankerous, the idea that he intended to slaughter the Salon pictures was erroneous. He hinted, as his reason for abstaining therefrom, that he had too much regard for his own personal safety.

Coming to the first head of his subject—*seeing and not seeing*—Mr. Lambert said that the old saying, that "seeing was believing," was a rusty saw. Seeing, in his opinion, was mostly disbelieving. We only saw through one pair of eyes. An antiquary, a geologist, a botanist, and an entomologist, looking upon a landscape, would each see features in it that the others would not. So, of a number of artists, one would see form only; a second, colour; a third, the face of nature as something that represents great forces; a fourth sees a reflection of himself in different moods, a fifth sees also personalities akin to his own. He quoted the remark of a workman whom he once met on the top of a tram car, that the "hi makes its hown beauty," and said the philosophy of the observation was sound. The eye, in fact, saw what it looked for.

What to look for? We were to look for Art. But what was the meaning of Art? Art was poetry, and poetry was the expression of

beautiful thoughts in beautiful language. Artists, then, selected the beautiful things of life, and put them before us in a beautiful way. As to truth in a work of art, just as there were several kinds of beauty so there were several forms of truth. Beauty varied according to the aspect of the object; it appealed to different sides of the mind. He thought that people generally spoke the truth when they used idioms. Touching upon the question of morality in art, his opinion was that, though it had not a primary place, yet it had a legitimate and necessary place. Sensuous and brutalising works did not live. A work of art, to be a great one, must be true. Shakespeare was a great writer because his works dealt with the realities of life and were perfectly true. Mr. Lambert then alluded to Mr. Luke Fildes' picture, *The Doctor*, which he said was a good work of art, because it dealt with a subject that was a necessary factor in a good life, viz., unselfishness; such pictures strengthened men's lives, and women's work would be done better by their having the best parts of their lives thus appealed to. Landscape work could never be the highest and noblest art work, inasmuch as the landscape painter could not deal with the emotions.

Coming to the next head of his subject "What not to look for," he said he thought it was a mistake for a man to try and find imitations of well-known pictures in photographs Another mistake was to allow one's self to be influenced by the special kind of treatment adopted. We should endeavour to see what a man has to say in his work and try to realise his version of the particular story he is telling. He deprecated sameness of work among photographers who, once having attracted notice by their photographs, adhered to the same style and treatment. In examining pictures, we should endeavour to do so without prejudice and place ourselves in the position of the man who took the picture. As to what constituted success in picture-making, he thought that, if a man hit the mark he went for, he had secured the first step towards success. Mr. Lambert concluded by going over the principal points already touched upon.

In the course of the discussion that followed, Mr. George Davison congratulated the Rev. Mr. Lambert on getting more tolerant towards artistic photography. He (Mr. Davison) did not think that art necessarily had any moral aim or didactic purpose whatever. The artist's function was not that of the preacher; he might express facts, but they need not be religious facts. Referring to *The Doctor*, he characterised it as "*Daily Telegraphese*" and "screaming." It was, he thought, inadvisable to classify art, and he contended that landscape gave one as much scope as other forms of art. He concluded by ironically defending Mr. Lambert against himself, saying that he was "advanced" and is advancing.

Mr. Rowland Bryant also criticised Mr. Lambert's references to *The Doctor*, saying that he was trying to make out that art was all of one kind, whereas it was of different kinds. Mr. Bryant appeared to be of opinion that the true artist followed art for art's sake only.

Mr. Horsley Hinton asked for Mr. Lambert's definition of truth in art, and pointed out that the lecturer had informed them that twenty individuals would each see a landscape differently, so that what was truth to one could not be so to the other nineteen. Who, then, was to decide? He criticised Mr. Lambert's suggestion that, because a man hit his mark, he necessarily produced a work of art.

Mr. Alfred Maskell was also severe on *The Doctor* being considered a work of art. The play of *George Barnwell* had, it used to be said, been instrumental in converting thieves and bad characters; but that did not make it a great work of art. This was putting art on the level of a tract or a sermon.

After some other remarks, Mr. Lambert replied to the criticisms his discourse had evoked. He defended the much-abused *Doctor*, saying that he didn't care twopence about its faulty technique.

A vote of thanks to Mr. Lambert concluded the proceedings.

THE EASTMAN COMPANY'S NEW PLATINUM TONING BATH FOR SOLIO (FOR SEPIA TONES).

Stock Solution.

Potassium choloro-platinite	5 grains.
Citric acid	40 ,,
Sodium chloride (salt)	40 ,,
Water	20 ounces.

Wash the prints from five to ten minutes, then immerse in the above bath. Examine the prints by transmitted light.

Tone to a dark brown or chocolate colour (not black), then, without previous washing, immerse the print in the following bath to stop toning action:—

Carbonate of soda	1 ounce.
Water	20 ounces.

Slightly rinse the prints and transfer to the

Alum Bath.

Alum	½ ounce.
Water	20 ounces.

Allow them to remain in the alum bath for ten minutes, wash thoroughly in running water for five minutes, and fix in

Fixing Bath.

Sodium hyposulphite	3 ounces.
Sodium sulphite	1½ ,,
Water	20 ,,

Wash thoroughly in running water, or by frequent changes, for one hour.

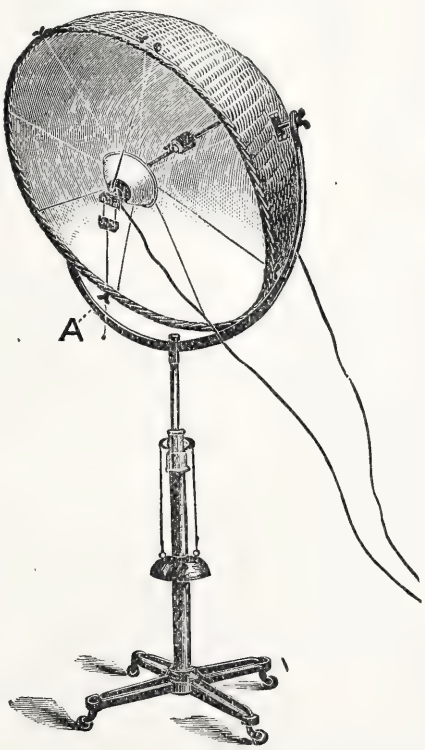
Dry the prints by laying them upon, not between, blotting-paper, face upward, or suspend them by one corner and allow them to dry spontaneously.

This formula has been in use by the Eastman Company for some months, and thoroughly tested by them. It is particularly recommended for use with their *new and improved Matte Solio paper*, and, we are informed, produces most pleasing and exquisite results.

HOUGHTON'S IMPROVED FORM OF ELECTRIC-LIGHTING APPARATUS.

Since noticing the electric-lighting apparatus brought out by Messrs. G. Houghton & Son last March, several improvements have been introduced in it, making it much more portable and easy to manipulate than formerly. Mr. G. Houghton summarises the chief points of the apparatus in the following excellent description:—

"Firstly, as to the general construction of our apparatus.—I would point out that ours has all the advantage of easy movement of the reflector and lamp that is possessed by the overhead systems, which certainly do not add to the appearance of a studio, and, in addition, has the enormous advantage of being able to be moved about from one or the other side or end of the studio—limited only by the length of cable—with the greatest ease, and can also be transported to a ball-room, theatre, or wherever there is the means of connecting it with an electrical supply, or it can be pushed into a corner out of the way when not required for use.



"Secondly, as regards the reflector.—We have adopted basket work as a basis, in preference to metal, principally for the sake of lightness; but, of course, other material can be used if preferred. In the incandescent system, introduced by Mr. Adamson, the reflector is certainly lighter and less bulky, and also more sightly from being transparent; but it must be borne in mind that we do not use a direct light, as in the incandescent system, but a reflected light, and therefore our reflector must be so constructed as to distribute the rays, if necessary, over a larger surface.

"The transparent reflector seems to me also to admit the light behind, where it is *not* required and may be objectionable, and also to waste a good deal of the reflective power where it *is* required.

"Thirdly, as to the lamp itself, which constitutes the main portion of our patent.—We claim that the hand feed, as it is called, which, by simply turning a button, brings the carbons together until an arc is formed, and will last without further attention from five to ten minutes, is preferable to either the automatic feed, as it is called, produced by an expensive mechanical action, and also to a number of incandescent lamps, which would require constant renewal.

"As regards noise, the incandescent system has here a distinct advantage over both the hand-feed and the automatic systems, as it is practically noiseless, but our hand-fed lamp, it will be noticed, even on the alternating current, has very little noise, and, on a direct current, none at all, while the noise from the automatic feed on the alternating current is almost unbearable.

"I then come to the crowning test of all in the sense of commercial practicability, viz., first cost of apparatus, cost of maintenance, cost of electric power.

"The cost of our apparatus is 25*l.*, and from 5*l.* to 10*l.* for connecting it with the main, brought into the studio, including the necessary resistance. The cost of maintenance is *nil*, there being positively nothing to get out of order, and a pair of carbons lasting a large number of exposures. I am told, on good authority, that our two carbons cannot possibly consume anything like as much as the incandescent system

during an exposure. I believe I am right in saying that the cost of an overhead automatic feed lamp is twice as much as ours, and of the incandescent system at least three times, while the repairs in the one case of the mechanical action, and the renewal of lamps in the other, must be very considerable."

On the occasion of a recent demonstration of the apparatus several highly satisfactory portraits were taken by its aid. In its new form it will doubtless, commend, itself to the increasing number of photographers who are adopting the electric light for studio work.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, October 23, at 8 p.m., at 5A, Pall Mall East.

EALING PHOTOGRAPHIC SOCIETY.—Messrs. W. England, Fred Hollyer, and E. J. Wall have kindly consented to act as Judges at the Exhibition of this Society to be held on November 21 and 22, 1894.

MR. H. HAUSSMANN, formerly of the firm of Messrs. Arthur Schwarz & Co., is establishing himself in business at Hamburg as a photographic dealer, &c., under the style of Haussmann & Co., 29, Rathhausstrasse, Hamburg.

A RESIDENT of Dorking, Mrs. Rachel Mann, was one day last week sitting for her photograph at the establishment of Mr. Yeo, in High-street, when she fell from the chair and expired before medical assistance could be procured. Death is attributed to heart disease.

PHOTOGRAPHIC CLUB.—On Wednesday, October 24, Mr. Alfred Watkins will give a demonstration on *Timing, Development with Different Developers.* Visitors are invited to the Club's meetings, which are held on Wednesday evenings at Anderton's Hotel, Fleet-street, E.C.

THE PHOTOGRAPHIC EXHIBITION.—Lantern fixtures for the week:—Monday, October 22, slides by London and Provincial Photographic Association and Photographic Club. Wednesday, October 24, slides by T. Brownrigg, Esq. Saturday, October 27, slides by Commander Gladstone.

THE Hon. Secretary of the Aldenham Institute Camera Club writes: "This Club has only just been made open to the public, the membership having been confined to members of this Institute. Now that this restriction has been removed, we hope to see a large number of new members from the St. Pancras and Camden Town districts. The subscription is 2*s.* 6*d.*"

A CAMERA DISPUTE.—At Nuneaton County Court on Saturday, before Judge Wightman Wood, Frank Ellis, hatter, sued A. E. Greaves, of Rochdale, for 8*l.*, damages for the detention of a photographic camera. Mr. Oakey, Nuneaton, appeared for the plaintiff, and the defendant was unrepresented. From plaintiff's statement it appeared that defendant advertised in the *Photographer*, stating that he wished to dispose of a half-plate camera set for a whole-plate set. Plaintiff wrote for particulars, and offered to deposit his whole-plate with the editor of the *Photographer*. Defendant replied if he (plaintiff) liked to send his set on approval, he (defendant) would pay the carriage both ways. Plaintiff sent his camera on July 12, and on the 16th defendant wrote to say that the focussing screen had been broken in transit, and that it would cost 1*l.* 10*s.* to put the camera in complete repair. Plaintiff refused to sanction this outlay, and the defendant sent his half-plate set. Further complications arose as to the alleged value of the respective instruments, and defendant refused plaintiff's offer to submit the matter to the editor of the *Photographer* for arbitration. Plaintiff then sent defendant's camera back, but could not procure his own without payment of 1*l.* 10*s.*, which defendant now counter-claimed for repairs. His Honour gave judgment for the sum claimed, but Mr. Oakey asked for an order to be made for the return of the plaintiff's camera on the ground that there was a bill of sale over defendant's furniture. His Honour made the order, and allowed 1*l.* damage for the detention of the camera.

HOW THE ACADEMY PICTURES ARE SELECTED.—"All being in readiness," says Mr. Stacy Marks, in his recently published book, "the President taps with his hammer, and addresses a few words to the carpenters, telling them on no account to divulge abroad any of the proceedings in the building when the judging begins. Pictures from the country, sent on the Saturday, are the material first dealt with; before these are exhausted, the London supply pours in. Expression of opinion is slow at starting, like the bidding for some works of art in an auction room. As a general rule, the pictures first brought up are of indifferent quality. When watching the stream of incompetent work, I have often thought of the wiseacres of strong arithmetical bias, who, by elaborate calculations, discover that not more than one minute and some decimal fraction is the average time devoted to the consideration of a picture. But does it require a second of time to form an opinion on the plainness or prettiness of a woman? 'You can tell a good picture as you pass in a hackney-coach' is a saying attributed to Constable, and he might have added that the same amount of time would suffice for deciding the badness of several. 'Out! out!' is cried in continual chorus as a stratum of work, more than usually bad, is discovered. They come in seeming endlessness, and the head carpenter, keeping his eye on the President, 'crosses' their backs at the rate of an Oxford stroke—thirty-five or thirty-six to the minute. Now a hush; the voices eager for rejection a moment ago are soft and low in murmuring admiration for a fine work by some clever outsider. Beauties are pointed out and dwelt on, but time warns that admiration must not be too long indulged in, and the picture is removed to the place of 'accepteds,' amidst 'bravos,' and, more rarely, clapping of hands."

Death of Mr. Thomas Scotton.—We much regret to announce the sudden death of Mr. Thomas Scotton, who, for a good many years, has been widely known and respected as photographer to the Midland Railway Company. The deceased gentleman, who was fifty years of age, appeared in his usual health up to leaving business on Tuesday October 9th, but was taken ill on the way home, and on arriving at his residence, 9, Church-street, New Normanton, it was apparent his condition was a dangerous one. Dr. T. Highton, of Normanton-road, was sent for, but the deceased never rallied, and died at six o'clock in the evening, having broken two blood vessels in his head. Mr. Scotton was personally very much esteemed by all who knew him, and his death will be mourned by a very large circle of friends and acquaintances. He had been in the employ of the Midland Railway Company thirty-four years, having entered the service as a youth. He was engaged in the painting department up till 1882, when he was appointed to the position he held at the time of his death. His knowledge of photography was equalled by few, and his work was well known at the leading exhibitions of photographic subjects throughout the country, Mr. Scotton having won medals and diplomas at almost every Exhibition he showed at. His kindness of heart was proverbial, and many were the interesting entertainments with his magic lantern he gave for the amusement of the orphanage children, the deaf-and-dumb inmates, and for the benefit of many other charitable institutions. The Borough Coroner (Mr. J. Close) held an inquest on the body of Mr. Scotton at the Town Hall on Wednesday morning, when, in accordance with the evidence of Dr. Highton, a verdict of "Death from apoplexy" was returned. Mr. Scotton's son is also a well-known photographer, and in the employ of the Midland, whilst his elder brother, Mr. Amos Scotton, is a prominent figure in the co-operative world, being closely identified with the operations of what is known as the Wholesale Society.

HALF-TONES ON DRY PLATES.—Mr. Max Levy, in *Paper and Press* (Philadelphia), says: "The possibility of adapting gelatine dry plates has furnished another much-discussed point in connexion with this work, and Mr. William Gamble, writing in THE BRITISH JOURNAL OF PHOTOGRAPHY, has brought down upon himself a torrent of abuse for complaining of the slovenliness too often incident to wet-plate work. Perhaps the occasion for the abuse may have been a too severe attack upon the British wet-plate worker; however that may be, we sympathise strongly with the view that wet-plate work is a very dirty work compared with dry plates; besides which, we are confident that the advent of dry plates in this field will not only add to the comfort of the operator, but will facilitate, as well as improve, the quality of the results. In making a half-tone negative as it is done at present, much of the quality of the result is a direct product of a vigorous intensifier; one that has the property of building up a relatively weak deposit of silver to such a density as will render it opaque to light, which is, for practical purposes, as intense as portions having really a heavier deposit; and it must be remembered that this very process involves a material loss of delicate gradation of light and of detail, which is apparent in the negative before it is intensified. This is due to varying density in the deposit, but the negative cannot be used in this condition in connexion with the means of printing or transferring to the metal, which seems to be an essential condition of etching, so the negative must be intensified with a 'hard-and-fast' intensifier, with the resulting loss above indicated. In a dry plate, it is at least possible to obtain the necessary printing density without intensification—certainly without this vigorous kind of intensification—and this fact implies an essential gain in detail, and modulation in the reproduction. The making of good half-tone negatives on wet plates requires most excellent judgment and careful manipulation, but having secured a good nagative, made up of strong and solid opaques and clear transparent dots, the printing, or transferring to the metal, is comparatively simple, so far as judgment and skill are concerned. On the other hand, a half-tone dry-plate negative will be comparatively easy to make, but more difficult to print, than the wet-plate negative, so that it becomes largely a transfer of the requirement of exceptional ability from the work of making the negative to that of printing it. The present writer, as much as six years ago, made some very excellent etchings (measured by the standard of that time) from half-tones, which he made on gelatine dry plates, but the entire work was done with the greatest care, and upwards of one hundred of these plates are printed in a fine publication. We are confident, however, that with the means at present at hand, the gelatine dry plate is not commercially available for half-tone work. Before gelatine dry plates can be successfully applied to every-day work on a commercial basis, some essential requirements must be supplied. We know of a method in course of completion having this object in view, but which cannot at present be disclosed on account of patentable features, which are being made the subject of application for letters patent, but we fully expect, in the near future, to lay before our readers a practical and commercially available method of making half-tones with the aid of gelatine dry plates, and we believe that the method will show some distinct advantages in point of quality over present results."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,223.—"Improvements in Photographic Plate-carriers." A. J. MASON. *Dated October*, 1894.

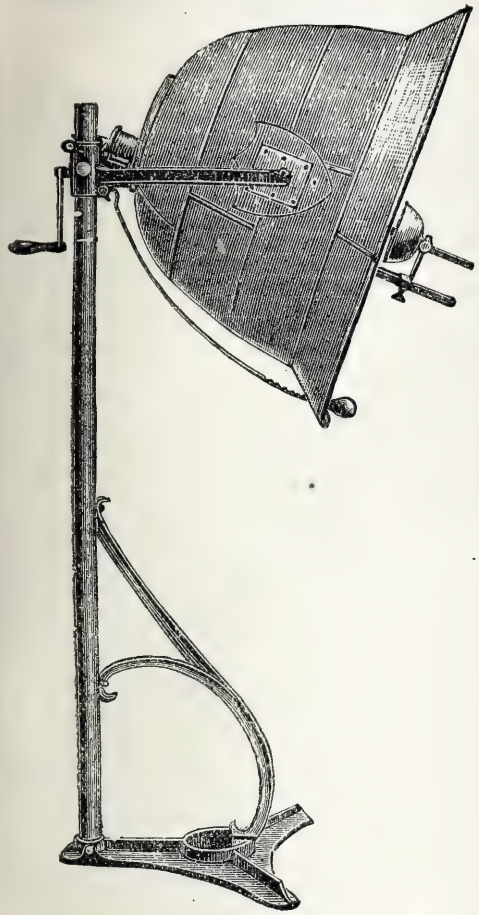
No. 19,329.—"An Improved Photographic Shutter." A. C. JACKSON.—*Dated October*, 1894.

No. 19,414.—"Casket for containing Photographs." A. MURRAY.—*Dated October*, 1894.

No. 19,417.—"A Changing Action and Sheaths for Photographic Cameras holding Plates or Films." A. E. STALEY.—*Dated October*, 1894.

No. 19,509.—"Improvements in and relating to Photographic Objectives." Complete specification. P. RUDOLPH.—*Dated October*, 1894.

THE GWYNNE-PILSEN ELECTRIC LIGHTING APPARATUS.



Messrs. Gwynne & Co., of Brook-street, Holborn, have introduced a form of electric lighting apparatus, which in some respects has advantages over that originally brought out two years ago as the Pilsen Lamp. It will be remembered that this was swung from the roof, and had an universal adjustment of movement. Its price was 45*l*. The new form, as will be seen from the illustration, has several points of difference. In the first place the reflector itself is smaller. This, which is of light metal, is painted of a suitable colour for radiating light. The light itself, of the usual automatically fed arc form, and capable of being regulated, and in action is quite noiseless. The reflector is placed on an upright stand, and can be easily raised and lowered, or placed in any desired position. Connected with the Company's mains, a power of 8000 candle power is obtained. The cost is 28*l*. Over thirty photographers are at present using the apparatus, many of them being exceedingly well known in the profession.

Our Editorial Table.

Dublin Convention Photographs.

By Richard Keene.

Whatever Mr. Keene, the President-elect of the next Convention, does, he does well. Having followed the lead of many others, he visited Killarney after the close of the Dublin meeting, and instead of hurrying over the ground, took his time when there, and secured several charming pictures. The selection from these now before us are beautifully printed in platinotype, in which method of printing Mr. Keene has long been a master, and are mounted on $14\frac{1}{2} \times 10\frac{1}{2}$ boards. His *Muckross Abbey* is a masterly piece of architectural photography, of which the same may be said of a companion picture of *The Cloisters* of this edifice. *Ross Castle* has been taken from a point of view different from that selected by those whose time permits only of a flying visit to the place. Mr. Keene has taken it so as to show an arm of the lake jutting partly across the foreground, reminding us of the Castle having been taken, in another sense, by Cromwell's forces from a point in that immediate vicinity. In taking *Torc Waterfall*, a very careful study has been made of the foreground, so as to show the fall itself to advantage. The *Round Tower and Cross* at Monasterboice, suggest that Mr. Keene's camera has not confined itself entirely to the Killarney district. Were it possible to institute comparisons between Mr. Keene's artistic productions, we should say that his *Entrance to the Gap of Dunloe* is probably the finest he has ever taken, either in Ireland or elsewhere. The composition is truly admirable; in the centre distance, we have the Gap, or mountain pass, about half a mile away; jagged rocks and crags are on the immediate left; a bit of the upper lake is on the right, while a little Irish maiden is neatly posed in the centre. Altogether, Mr. Keene adds to his already high reputation by these Killarney pictures.

An Art Folio.

By W. Tylar.

With a view to rendering "good photography" more popular, Mr. W. Tylar, of Birmingham, has issued this, the first, copy of his *Art Folio*. It contains six selected views respectively of Alton Towers, Tintern Abbey, Chepstow Castle, Hawarden Castle, Kenilworth Castle, and Ann Hathaway's Cottage. The pictures are of large dimensions, and are well printed by permanent process. From the low price (3*s*. complete) at which the album is sold it is certain to be in large demand.

Bi-Gum.

This is the registered name given to a sterilised paste for mounting prints, a sample bottle of which we have received from Messrs. Smith, Kay, & Co., 13, Rathbone-place, London, W. It claims to be made by a new process, and will not turn watery, or sour, or stain the paper. It certainly holds tenaciously, and, so far as we have tried it, appears to warrant the claims made on its behalf. Price 6*d*. and 1*s*. a bottle.

Christmas Photographic Card Mounts.

Messrs. George Houghton & Son having brought out a set of new patterns of these mounts, have sent us samples of the same. They are both ornate and elegant, and are of useful dimensions. We select two from their numerous patterns for reproduction.





These mounts being now seasonable, photographers ought to lay in a stock at once.

The Bessus Film-holder.

Messrs. Airs & Co., 152, Farringdon-road, W.C., have sent us a sample film-holder, intended to hold spool or cut films, flat and firm, during development and finishing. It consists of a flat metallic holder with a handle, in which the films are firmly clipped by side springs. Holders for quarter-plates sell at 12*s*. a dozen.

Snap-shot Photography.

By Martin J. Harding.

This *brochure*, published by Percy Lund & Co., forms the first of "The Junior Photographer Series." Mr. Harding is a very competent photographer, and in this booklet he draws upon his own experience, and illustrates it from his own work. He is a strong advocate for separate dark slides in the hand camera instead of employing the magazine system, which, he says, may sometimes suddenly adopt the "block system" at a critical moment, necessitating an adjournment to the nearest dark room, which may be many miles away. *Apropos* of the many pretty little pictures in the work, query, is not the moon in the Conway Bay view made twice as large as it ought to be? The book is well written, and the information and instruction imparted may very safely be trusted. Price 6*d*.

Messrs. Lund & Co. have also sent samples of mounts for Christmas and New-year's cards. There is space left for affixing either portrait or landscape photographs, the mounts being in a variety of forms and styles.

Astronomical Photographs.—It was recently announced at a meeting of the Royal Astronomical Society that Professor Barnard, of the Link Observatory, had sent a series of positives of his astronomical photographs as a present to the Society. He sent, altogether, more than sixty glass positives, chiefly of comets, but including few specimens of stars and eclipses. The most remarkable are those of Brook's comet, where the tail is in process of being shattered, as though by some cyclone of space. All these photographs will, at an early date, be published by the Society. Professor Barnard undertook himself the whole of the manual labour of taking the originals and copying them. A series of experimental negatives, taken by Warren de la Rue in the very early days of astronomical photography, are also exhibited. Many of the impressions taken in the winter, 1857–1858, show nothing at all. The star images have completely disappeared—even those which were described and labelled "intense" by de la Rue. This fact has an important bearing on the necessity of measuring plates as soon as they are taken.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
22	Camera Club	Question-box opened. Lantern Slides in the Large Room.
22	Central Photographic Club	*Intensification and Reduction.* W. Ethelbert Henry.
22	Lantern Society	
22	North Middlesex	
22	Putney	
22	Richmond	
23	Birmingham Photo. Society	
23	Brixton and Clapham	*The Choice and Use of Photographic Apparatus.* Hon. Secretary.
23	Camera Club	House Dinner.
23	Hackney	*Mounting and Framing.* J.C.S.Muumery.
23	Newcastle-on-Tyne & N.Counties	
23	Paisley	
23	Rochester	
23	Royal Photographic Society	Technical Meeting.
23	West London	
24	Croydon Camera Club	Lantern Night.
24	Leytonstone	*Isochromatic Plates and How to Use them.* W. H. Barnes.
24	Photographic Club	*Timing Development with Different Developers.* Alfred Watkins.
24	Photographic Salon	*Arrested Movement and a Living Pose.* Rowland Briant.
24	Southport	
24	West Surrey	Lantern Night.
25	Camera Club	*A Study of Towers and Spires, with special reference to those of Somersetshire.* Professor F. J. Allen.
25	Glossop Dale	
25	Halifax Photo. Club	
25	Hull	
25	Ireland	
25	Leigh	Developing Demonstration by various members.
25	Liverpool Amateur	
25	London and Provincial	Open Evening.
25	Oldham	
25	Woolwich Photo. Society	Demonstration by the Autocopyist Co.
26	Cardiff	
26	Central Photographic Club	*Black and White; or, the Preparation of Illustrations for Photo-reproduction.* Horsley Hinton.
26	Croydon Microscopical	Conversational Meeting.
26	Holborn	
26	Maidstone	
26	Swansea	
27	Hull	
27	Leytonstone	Social Meeting.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 11,—Mr. J. S. Teape in the chair.

Mr. A. J. BROWN referred to his quotation at a previous meeting as to the solubility of silver bromide in bromide of potassium, and said that he had tried the experiment without success.

Mr. L. MEDLAND showed two negatives with irregular light and dark patches on them, and asked the cause. No explanation appeared to be forthcoming.

Being a Lantern Night, slides were shown by Messrs. Welford, Medland, Austin, Chang, and others.

PHOTOGRAPHIC CLUB.

OCTOBER 10,—Mr. H. M. Hastings in the chair.

Mr. NESBIT asked the Chairman what was the focus of his hand-camera lens.

The CHAIRMAN said it was five and a half inches.

Mr. NESBIT said he would not expect such a lens to cover unless well stopped down.

Mr. E. W. FOXLEE showed results from a five and a half inch French lens at *f*-11, which left nothing to be desired.

Mr. BELLOT showed some Frenagraphs as the results of the last outing to Hampstead.

Mr. W. E. DEBENHAM referred to some results he had seen recently, the negatives being developed with pyro-soda, hydro, glycin, velox, &c.

Mr. NESBIT asked if any member had had the hardihood to mix metol, hydro, velox, amidol, &c., together, and what would be the result.

Mr. WELLINGTON said that he was experimenting in that direction; he found hydroquinone and metol gave him greater latitude with bromide paper.

Mr. NESBIT asked if any one had been to the Salon. He had, and gave it as his opinion there were about fifty good pictures there. One small picture amongst many had excited his curiosity; he had tried again and again to decide what the subject was—the price was plain enough (24*s.*), but he could not fix on the subject.

Mr. R. KEENE said the Salon filled one object—it made the Royal look to its laurels. There was no favour shown in the hanging.

Mr. NESBIT said there was one picture that looked to him as though it had been gone over with a curry-comb.

The CHAIRMAN asked if it would be possible to obtain an enlarged negative from a quarter-plate negative without intervention of a positive.

Mr. DEBENHAM said everything would depend on the plate.

Mr. CLIFTON suggested trying Col. Waterhouse's process. He also quoted the following instance:—A lady, when photographing the interior of a room, thought it required a long exposure. She took an Ilford red label plate worked lens at *f*-8, and gave forty-five minutes' exposure. Result: The landscape seen through the window was shown as a perfect positive.

Brixton and Clapham Camera Club.—The opening meeting of the sixth winter session was held in the Clarence Rooms, Coldharbour-lane, on Tuesday evening, the 9th inst., when Mr. JOHN A. HODGES (President of the West London Photographic Society) delivered an interesting lecture, entitled, *Through North Devon and Somerset with a Camera*, to an audience of about two hundred and fifty. The CHAIRMAN (Dr. Reynolds) introduced the lecturer, who at once proceeded with his subject. Throughout the whole, the keenest interest was manifested, the lecturer being continually greeted by outbursts of applause. It required no great stretch of imagination to think oneself at the different quaint and picturesque towns and villages, pictures of which were thrown on the sheet. Special mention must be made of views of Porlock, Minehead Sands, Lynmouth (taken from various points), Lorna Doone, a glen rendered famous by R. D. Blackmore in his noted book of that name; Ilfracombe, including Lantern Hill (on which stands the ancient church of the sailors' patron, St. Nicholas); Bideford, and the grand old fishing village of Clovelly, with its "steep stair of houses clinging to the cliff." The best scenery, however, was the series of views on the river Lynn. The lecturer did not offer any comment on them, for he said they needed none, and they certainly did not; they simply beggared description. During the evening the lecturer threw upon the sheet a photograph of one of Landseer's famous pictures, *A Stag Hunt*, and while describing one of these hunts which takes place in Devonshire, as in other places, said the audience could not wonder at him crying "Shame" at every opportunity, when speaking of this inhuman practice called, or rather miscalled, "sport," and the audience heartily coincided with his views. Mr. Hodges, on the conclusion of his lecture, which occupied nearly an hour, was loudly cheered. The Chairman was sure they would all accord their best thanks to Mr. Hodges for his very interesting lecture. In speaking of their contemplated removal from the Clarence Rooms, he said many wondered why they were going to alter their place of meeting to the Brixton Hall. The Club having greatly increased in popularity lately, and the Clarence Rooms being so much in demand for balls, parties, &c., the executive were no longer able to guarantee to them the use of the rooms each week for their meetings. In reviewing the past two years, the Chairman said they started with thirty members, and had since increased to sixty-eight, scarcely a meeting night passing without some new member being admitted. Some slides by members were afterwards shown, and the meeting closed.

Croydon Camera Club.—The subject for Wednesday, October 10, was *Lantern-slide Making for Beginners*, ably described and demonstrated by Mr. G. CORDEN, who showed his audience what are the most critical operations in obtaining various tones, such as black, brown, red, &c. As an instance of quick availment of the Club's advantages, last week Mr. Hirst, as reported, explained a simple system of enlarging; in the interim Mr. Noaks has constructed a lantern on the same principle, and exhibited a twelve-inch by ten-inch picture, which, although the first one attempted, left little or nothing to be desired. The President appealed to members for prints of negatives taken at the Deepdene, in order that a selection should be forwarded to Her Grace the Duchess of Marlborough, and announced that the first public lantern show was fixed for November 7, when Mr. Horatio Nelson King will give a lantern chat on *Our Royal Palaces*.

Derby Photographic Society.—The first meeting of this Society for the winter session took place at Smith's Restaurant, Victoria-street, on Wednesday evening, October 10, Mr. A. B. Hamilton presiding. The CHAIRMAN, who said it was his painful duty to inform the members present of the very sudden death of their esteemed colleague, Mr. Thomas Scotton, who had been associated with the Society from its commencement, spoke in feeling terms of his great energy for the welfare of the Society, and of his ever-ready willingness to help all those in difficulty. The loss to them would be very heavy, but how much more so would it be to his relations and near friends! It was proposed by Mr. George Walker, and seconded by Mr. Fleet, that a letter of condolence be sent to the relatives of Mr. Scotton, expressing their heartfelt sympathy with them in their severe bereavement. As an arrangement had been made some time back with Mr. A. C. Baldwin, the representative of the Eastman Photographic Materials Company, to give a demonstration on the productions of that Company, and, he being present, it was decided, after discussion, that under the circumstances Mr. Baldwin should proceed with his paper. Mr. BALDWIN, in his opening remarks, also spoke highly of the courtesy received by him from the hands of Mr. Scotton on his previous visits to this Society, and hoped he would be pardoned if he cut his remarks somewhat short. The lecturer explained with great clearness all the most recent productions of the Eastman Company, and handed round specimen prints of the paper introduced by that firm, and threw out some unique suggestions as to the manipulation of the same. He also developed some very fine prints on their new platino-bromide paper, which were much admired. A vote of thanks to the lecturer and to the Chairman concluded the meeting.

Hackney Photographic Society.—October 9, Mr. E. Puttock presiding.—Mr. Gardner showed specimens to prove that sepia is a colour in itself. What is known as warm sepia is a mixture of pure sepia and crimson lake. Vandyke brown is composed of pure sepia, gamboge, and a little red. Dr. Gerard Smith showed examples of "flare spot" produced by the use of a yellow-colour screen close in front of the lens diaphragm. Mr. Cole showed a quarter-plate hand camera of his own design, and claimed some important features. By the use of two shutters—one in front and a "focal plane"—exposures could range from time to one one-thousandth of a second. Lenses of from four inches to nine inches focus could be used. The special feature of the instrument was a very effective rising front, which is Mr. Coles's patent. By its use the swing back was in most cases rendered unnecessary, although one was fitted to the camera. Mr. HENSLER asked for an opinion as to the permanence of uranium-toned slides, and in reply Mr. S. J. BECKETT said that some slides toned in the

way suggested by the question, although carefully kept, showed signs of fading in the half-tones. The rest of the evening was devoted to showing on the screen members' lantern slides.

Lantern Society. — The first meeting of the session took place on October 8, at eight p.m. The collection of slides going to America was exhibited, and after this a very hearty vote of thanks was voted to Commander Gladstone, the retiring Hon. Secretary.

West Surrey Photographic Society.—October 10, Mr. Winsford (Vice-President) in the chair.—Five new members were elected. A suggestion that the lantern should be at the disposal of the members for trial of their slides was referred to the Committee. A representative of the Eastman Company gave a demonstration on their *Platino-bromide Paper*, which was listened to with great interest. After the development of some four or five prints, and a short discussion, the meeting closed with a hearty vote of thanks to the demonstrator.

Woolwich Photographic Society.—The second annual business meeting of the Woolwich Photographic Society was held last Thursday, the President (Rev. S. E. Chettoe, M.A.) occupying the chair. At the commencement of the proceedings, fourteen new members were elected, and received a cordial welcome from the Chairman. The balance-sheet and report of the Council were presented by the Hon. Secretary, and were unanimously adopted. The accounts show a small deficit (about 3*l.*), but the meeting was evidently not disposed to dwell seriously upon that in view of the very satisfactory prospects of the future. The expenditure was considered abnormal, owing to the successful effort to push the Society forward, and now, with the greatly increased membership, the income will be sufficient to cover all the working expenses. The officers and council for the ensuing year were then elected, and are as follows:—*President:* Rev. S. E. Chettoe, M.A.—*Vice-President:* Colonel C. D. Davies.—*Council* (elected by ballot): Messrs. H. Maskell, W. H. Dawson, E. G. Kimber, W. R. Dunger, J. Caldes, and — Champion.—*Librarian* (a new office created by an alteration of the rules of this meeting): Mr. H. J. Spencer. —*Auditors:* Messrs. J. Quick and — Sudworth.—*Treasurer:* Mr. H. H. Barker.— *Hon. Secretary:* Mr. J. Borthwick Panting.

Glasgow and West of Scotland Amateur Photographic Association.—October 15, seventeen new members elected.—The PRESIDENT (Mr. Stewart Smith) reviewed the progress of photography during the past year. After referring to extensions and improvements in the rooms of the Association, he spoke of the work exhibited in the two great exhibitions now open in London. In referring to the great number of printing papers now available, he gave some useful hints drawn from his own experience. He discussed the present position of photography in colours, and described the three-colour process of pigment printing. A number of novelties in apparatus were on view, which the President briefly described. An exhibition of lantern slides by members followed.

Leigh Photographic Society.—Meeting held on the 11th inst., the President (Mr. Miles F. Burrows) in the chair.—Mr. E. J. BROWN, of the Zenotype Company, gave a very successful and interesting demonstration of the zenotype to a large attendance of members, who were astounded at the simplicity, cheapness, and the beautiful results to be got by the zenotype powder, such a variety of tones that is possible to suit the tone to the subject. After demonstrating with Ilford, Solio, Otto, and Citos papers, he invited the members to try the process. Messrs. Sephton and Hampson toned some prints with successful results.

Liverpool Amateur Photographic Association.—Under the auspices of the above, a lecture, by Mr. W. LAMOND HOWIE (member of the Scottish Mountaineering Club), illustrated by 120 views taken by the lecturer in Skye, Argyleshire, and the Grampian Hills, was given in the City Hall, Eberle-street, on Thursday evening, October 11, to a large and appreciative audience. In a very lucid and graphic manner, Mr. Howie led his listeners to those desolate scenes of ice-covered mountain-tops, and where, under trying circumstances, he had to use the photographic outfit, a branch of the hobby not often indulged in by photographers, amateur or professional. Altogether, his demonstration was unique and interesting, and the photographs shown proved the lecturer to be an enthusiastic and clever disciple of photography.

Nottingham Mechanics' Institution Camera Club.—The first meeting of the winter session was held in Room No. 75, at the Institution, under the presidency of Mr. T. K. Gordon, last Friday. Four gentlemen were nominated for membership in the Club. The CHAIRMAN then referred to the death of Mr. Thomas Scotton, of Derby, and the assistance given by him to the Club during its first winter session. On the proposition of Mr. R. G. Holbrook, it was decided to send a letter of condolence and sympathy to the family of the deceased gentleman; after which Mr. A. C. BALDWIN (representing the Eastman Company) gave a description of the various cameras, &c., supplied by this firm, and then proceeded to give a practical demonstration on *The Development of Eastman Platino-bromide and Nikko Papers.* Votes of thanks were unanimously accorded, on the motion of Mr. Roe, to the Eastman Company for making the arrangements, and to Mr. Baldwin for his practical demonstration.

Rotherham Photographic Society.—Tuesday, October 9, the Annual Meeting was held, under the presidency of Dr. F. B. J. Baldwin. There was a good attendance. The report of the Council showed that the year's work had been very satisfactory; the ordinary membership had increased, and, under a new rule, four honorary members had been enrolled. There had been a full programme of papers, demonstrations, and lantern nights; four excursions to popular and picturesque resorts; and the usual annual Exhibition, which presented many features of attractiveness. On the latter there was a deficit of over 2*l.* The photographic survey scheme had made some progress, but it was apparent that a voluntary work of this description must not be unduly hastened; in fact, the settlement of details had necessarily taken up a good deal of time. The financial statement was favourable; the Society, after having wiped off all liabilities—and the year had been an expensive one—was able to commence the new session with a balance in hand. Officers were appointed as under:—*President:* Dr. F. B. J. Baldwin.—*Vice-Presidents:* Messrs. E. Isle Hubbard, G. T. M. Rackstraw, and J. Leadbeater.—*Hon. Secretary:* Mr. H. C. Hemingway.—*Hon. Financial Secretary:* Mr. W. H. Shephard. These, with the following gentlemen, form the new Council, viz., Messrs. W. Firth, J. Baker, W. Mason, A. S. Lyth, and J. W. Whittington. The conditions for the members' competitions were approved and other routine business transacted. The first display of survey work was afterwards made, and the results were much admired. The lantern was also brought into operation for members' slides.

FORTHCOMING EXHIBITIONS.

1894.		
October 19–Nov. 3	...	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 19–Nov. 14	.	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,, 22, 23	.....	*East London Photographic Society. New Tabernacle, Old-street, E.C.
,, 22–27	.....	Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17	.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,, 20–22	.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22	...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 23–Dec. 1		*Stanley Show (Photographic Section).
,, 27–Dec. 1		*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,, 29–Dec. 1		*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
1895.		
March 25–30	.....	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE TELE-PHOTOGRAPHIC LENS.

To the EDITOR.

SIR,—My attention has been drawn to a very prominent paragraph in *Sharland's New Zealand Photographer*, dated August 7, 1894. This paper has a large guaranteed circulation. As it is possible that the paragraph referred to *might* be the means of doing me a gross injustice were it to remain unanswered, I beg that you will do me the kindness of inserting my reply to the Editor of that journal in full.—I am, yours, &c., THOMAS R. DALLMEYER.

25, *Newman-street, London, W., October* 9, 1894.

[COPY.]

The Editor, "Sharland's New Zealand Photographer."

THE INVENTOR OF THE TELE-PHOTO LENS.

DEAR SIR,—

My attention has been drawn to the following prominent paragraph in your issue of August 7, 1894:—

"The Inventor of the Tele-photo Lens."—On this subject Mr. A. Martin writes:—"I feel confident that Mr. McKay was the real inventor of the tele-photo lens, for, as a matter of fact, I was writing to Dallmeyer about some lenses, and I sent them a cutting from the newspaper giving particulars of Mr. McKay's lens, and, about a year after this, Dallmeyer's introduced their tele-photo lens."

I am unaware of any motive that could warrant your correspondent to write such a statement conveying a most poisonous innuendo against myself. On looking up my business correspondence of four years ago, I find that Mr. A. Martin wrote the firm a letter, dated August 18, 1890, asking for information as to the best method of using rapid rectilinear and portrait lenses for obtaining large heads, and with this letter Mr. Martin *did* enclose two (undated) cuttings that had reference to the work of Mr. McKay, of the Government Geological Department of New Zealand. The letter was replied to in the usual manner from my office.

Longfellow truly says somewhere words to the effect that half a truth is baser than any lie. Fortunately for me the cuttings have been preserved, with Mr. Martin's letter, which, by the way, contains *no reference whatever* to the subject-matter of the cuttings themselves. But still more fortunate for me and the public he would mislead, though humiliating to Mr. Martin himself, is the fact that he writes a short comment at the end of the cuttings, the comment being: "*I am told it is a biconvex lens placed between the object-glass and the plate, and is adjustable.*"

A glance at the particulars given in the cuttings enclosed in his letter were quite confirmatory of Mr. Martin's own conclusion. The information contained in them I give in the following extracts—the italics are my own:—

"A gentleman who was present informs us that the invention consists of the insertion of intermediate lenses between the object-glass of the camera and the photographic plate, so as to give the whole instrument a telescopic power."

"By the new arrangement *the whole is brought into one focus.* Views of the same scenery, by the ordinary and the new arrangement, were shown side

by side, and the difference was very striking. In the latter case, ridges many miles away were brought out so clearly that the very trees and limbs on them were distinct, and even the stratification and formation of bare surfaces could be identified *while the foreground was perfectly sharply defined.*

"Sir Julius Hector, Mr. Travers, and others spoke highly of the invention as likely to revolutionise photography, and prove of great value in astronomical research. *A patent has been applied for.*"

To any one who has only the most elementary acquaintance with the subject of optics (and this Mr. Martin may be presumed to have, as a lecture by him is reported in the same issue), it is self-evident that the results arrived at by Mr. McKay were those produced by what is known as "secondary magnification," a positive system forming the primary image, a second positive system, preferably of short focus, magnifying the primary image.

This process has been known and adopted for many years prior to the time of Mr. McKay's publication. It has been chiefly employed, as suggested in the cutting, in astronomical research. Twenty years and more ago special instruments for the purpose known as "photoheliographs" were made by my late father for our own, and nearly all the foreign governments, for obtaining large images of four to eight inches in diameter of the sun; in fact, our Royal Observatory, Greenwich, has employed one of the first ever made daily for the last twenty years for recording sun-spots when the sun is visible at Greenwich.

For ordinary photographic purposes there are many drawbacks to employing this system of "secondary magnification" as compared with the system of *direct enlargement*, by corrected "negative" systems, the subject of my particular work and patents in connexion with tele-photography. These drawbacks are—

1. The very small angle obtainable.
2. The feebleness of the illumination.
3. The very great bulk or size of the instrument and camera that are necessary.

In conclusion, I shall feel obliged to you if you will forward me a copy of your paper containing this letter, giving it due prominence, and also forward one to your correspondent, Mr. Martin, whose letter of 1890 was dated from Wanganui, N.Z., when I hope in due course to receive all apology and an explanation from him through your columns for this monstrous accusation.—Yours truly, (Signed) THOMAS R. DALLMEYER.

COMBINED BATHS.

To the EDITOR.

SIR,—I notice that, in the JOURNAL of the 6th inst., Mr. Herbert S. Starnes, at the close of an article by him, challenges your references to a recent correspondence on the combined toning and fixing bath, and proceeds to give what he calls the "fact" of the beginning of that correspondence. I do not propose to reopen the question then discussed, but should like to point out that Mr. Starnes comes forward as a teacher on photographic chemistry, and readers can only judge of the weight of his authority by the ordinary process of arguing from the known to the unknown.

Judged by this standard, Mr. Starnes's facts and inferences seem somewhat lacking, as any one may judge who remembers, or may think it worth while to refer to, my first letter on the subject, which appeared in the JOURNAL for July 13.—I am, yours, &c., WM. BISHOP.

October 13, 1894.

ROLLABLE FILM NEGATIVES *VERSUS* PAPER NEGATIVES

To the EDITOR.

SIR,—I have read with pleasure your leading article of October 5 on *Paper Negatives*.

My own experience, confirmed by that of most of my friends who have used both paper and celluloid, is that, in its rollable form, the advantage of transparency which celluloid possesses is more than counterbalanced by several disadvantages, some of so serious a nature that I, for one, have discontinued its use in the rollable form, though I still use the cut films. But I would gladly make use of paper for my work if I could only procure it, either in the original form in which the film was permanently attached to it, or that in which the film was stripped from it after development.

One great objection to celluloid is that, though perfectly flexible, its elasticity is so slight that it is next to impossible to get it to lie flat on the table of the roll-holder. In many rolls that I have had there seems to be a contraction of the film at the edges, which intensifies this evil. I send you the remains of a roll in which this defect is very plainly shown.

Paper, on the contrary, with all the flexibility of celluloid, has the elasticity which celluloid lacks, just in sufficient amount to permit of perfect flatness of surface being readily obtained in the roll-holder. The objection to paper on the score of its granularity is more imaginary than real, at least I never found that it showed in the prints. In the matter of convenience in development, paper is easily enough managed, but a celluloid film is about as intractable a thing in a developing dish as one could have to do with, constantly rising to the surface of the developer, and requiring the operator to keep his fingers in the liquid from the beginning to the end of the process in the effort to keep first one part and then another below the surface. There are other points in favour of paper, but they are minor ones, and I need not refer to them here.

I cordially echo your wish that the manufacturers would give us again sensitive paper for the roll-holder.—I am, yours, &c., R. I.

October 12, 1894.

THE PURITY OF OXYGEN.

To the EDITOR.

SIR,—About two years ago I addressed a letter to you on the subject of "Compressed Oxygen as supplied commercially for the Use of Lime-light Workers and Others." In that letter I pointed out how the success of the Brin process, by which oxygen is separated from the atmosphere in a state of great purity (the residual nitrogen amounting to only five per cent.), had stimulated competition—a state of things which would not be deplored by the public, if the product of the rival workers were equal in quality to that of the pioneers. By careful analysis, by means of a Hempel Absorption Apparatus, I had found that a sample of the rival gas showed nitrogen present to the amount of no less than forty per cent. That competition, as one would naturally expect, did not continue long, and I believe I am correct in stating that until quite recently the only oxygen commercially procurable was Brin's.

I have, within the last fortnight, tested two samples of oxygen obtained through a dealer from an admittedly new source of supply, and have found them to represent a mixture of oxygen sixty-five per cent, and nitrogen, thirty-five per cent. At the same time, I tested a sample drawn from a Brin Cylinder, and found it to contain less even than five per cent. of nitrogen. I can, therefore, corroborate the experience of Messrs. Haddon and Grundy, and was much interested in their article on this subject in your last LANTERN RECORD. I would advise all users of oxygen to obtain from those with whom they deal, some guarantee that the gas they sell is up to a certain standard of purity, and not a half-and-half mixture of oxygen and common air.—I am, yours, &c.,

T. C. HEPWORTH.

The Camera Club, Charing Cross-road, October 16, 1894.

THE SOURCES OF PHOTOGRAPHIC PHANTASMS.

To the EDITOR.

SIR,—Now and again there come to the front paragraphs of peculiar interest having relation to the mysterious and unwelcome manifestations which "development" sometimes makes visible upon otherwise irreproachable plates. It is evident that a course of experiment is desirable, and might possibly eventuate in tracing to their origin these phantasms. Otherwise we shall be led to attribute them to the unwarrantable intervention of spooks.

Whence, for instance, came that ghost in a slouch hat, which—not until after "development"—put in an appearance, holding by the nose the (portrait of a) donkey, but which (as Macbeth observes) "which was not so before?" And, again, we have the recent experience of a photographer who, having "taken" a church interior, finds upon his plate the ghostly outlines of a Gothic window, which window, in point of fact, had no existence in that part of the fabric.

But in this latter instance, fortunately, we are furnished with a clue that, mayhap, possesses an intimate bearing upon these phenomena at large. The mysterious window, which in the picture apparently stands about twenty yards in front of the camera, did really exist, but was situated some twenty yards behind the camera.

Until now it may not have been "set in a note-book;" but is it not an actuality that almost any plane surface which is capable of reflecting light is capable also of reflecting a veritable image, more or less defined and proportionately to the impact of light falling upon the object, capable not simply of presenting a mere shadow, but of reflecting that which, in a sense, is the converse of a shadow, and which is explicitly an image?

Latent, indeed, it might be, so far as human vision is concerned; but to the camera, nevertheless, it may as distinctly exist as did the painted-out name of the big ship. The reflected image might not even require a plane surface for its production any more than in the cognate case of the cloud-reaching lantern pictures. A morning fog, or a cloud of dust from the pew opener's sweeping brush, might amply suffice to enable the spook of the camera to materialise and erect for itself a Gothic window in the air! In such case, the relative position of the camera would be a secondary item, for the image would advance or recede conformably with the shifting of the camera, as in like manner does the iridescence of a rainbow recede before an advancing spectator.

It may be difficult in many instances to estimate by the eye the extent to which a given object, efficiently illuminated, is reproduced upon the plane surfaces which surround it. To wit, if the respective tints of the image and of the recipient plane somewhat approximate, the former could have no appreciable existence. Yet, undoubtedly, a latent image definitely exists upon all fairly recipient planes, and does so just in proportion to the volume of light thrown upon the object resurrected.

Hence it may reasonably be assumed that a sufficiently illuminated object would be capable of projecting itself upon even a painted panel or a photographic "background." And hence too, under due conditions, portraits suspended upon the walls, in the rear of the camera, might be found reasserting themselves, like disembodied spirits, upon some highly sensitised and well-developed plates.

The items of the problem may be summarised as follows: 1. All surfaces capable of reflecting light possess also, in a conditional degree, the cognate capability of transmitting a reflected image. 2. The visibility of the image will be in due proportion to the degree of illumination falling upon the object reflected, and of the lucidity of the recipient surface.—I am, yours, &c., W. MATHEWS.

Clifton, Bristol.

THE ENAMELINE PROCESS.

To the EDITOR.

SIR,—In your issue, October 12, p. 651, you publish a report of a demonstration on the *Enameline Process* that I had the pleasure to give at the London and Provincial Photographic Association. I beg to point out that a trifling error appears.

You say in the said report that I had replied to Mr. Everitt, the "process" had not been applied to zinc, &c. The meaning I intended to convey was the "process" had not been applied to zinc in a satisfactory way, although I have been experimenting in a new direction, and I get a "process" to work on zinc better than on copper in every respect.

I should be very much obliged if you would insert my letter in your next issue.—I am, yours, &c., H. CALMELS.

17, *Furnival-street, Holborn, W.C., October* 16, 1894.

PHOTOGRAVURE AT HOME AND ABROAD.

To the EDITOR.

SIR,—*Apropos* of your recent article and paragraph, may we suggest from our experience a reason for the execution of so little good photogravure in England? It is not "due to the better translating of the colours of pictures into monochrome that thousands of pounds' worth of work is sent to the Continent for execution," but to the bad old principle of buying in the cheapest market, regardless of any consideration except immediate profit. This has led to the degradation of almost every branch of photographic work. Granted a fair return for skill and knowledge, photogravure in any style or size may be obtained in London itself, fully equal to, even excelling, the best foreign work.

In refusing to work at Continental (we were going to say sweating) prices, are not English photogravurists to be commended for withstanding, at their own cost, the deplorable beating down of prices which is seen to have been so fatal to other branches of their art?—I am, yours, &c.,

DONALD MACBETH.

Typographic Etching Company, 3, Ludgate Circus-buildings, E.C.

P.S.—We notice, among other curious remarks, on another page, an assertion by Mr. Henri Calmels, that the enameline process of half-tone engraving has not been applied to zinc. This is quite a mistake, as we work the process on copper, brass, or zinc, just as desired.

LEYTONSTONE EXHIBITION RULES.

To the EDITOR.

SIR,—Referring to Mr. Edwards's letter in your last issue, may we point out this is the only adverse criticism we have received on the subject, most of our exhibitors expressing themselves pleased with the alteration, and we can only presume your correspondent is not sufficiently interested in lantern slides to appreciate the change.

As to its being against the rules of the Affiliation Judges, the only rules which apply to the case are Nos. 11 and 12, which read as follows:—

"11. No production of any kind whatever from the same negative shall receive more than one award. . . . . This includes lantern slides, enlargements, &c.

"12. No award shall be made to *a* lantern slide until it has been projected on the screen."

This, we take it, applies only to cases where a medal is awarded to a single slide, and not where the award is for six. Our Council (while endeavouring to follow the rules of the Affiliation Judges) are strongly of opinion the alteration is an improvement, and one likely to induce more of the first-class workers to compete in the various classes, and thus raise the standard of lantern work generally.—We are, yours, &c.,

FRED W. WATES, GEORGE H. CRICKS, *Hon. Secs.*

October 16, 1894.

POISONS ACT.

To the EDITOR.

SIR,—You are rather hard on the Pharmaceutical Society in the matter of carbolic acid. The Pharmaceutical Society can only* recommend the addition to the schedule, and this has been done more than once, but the Privy Council have refused on each occasion to endorse the recommendations.—I am, yours, &c., J. PIKE.

October 15, 1894.

To the EDITOR.

SIR,—With reference to your paragraph on the Pharmaceutical Society in last week's issue, the blame for the non-inclusion of carbolic acid in the Poison schedule should in fairness, be attached where it is due. The Pharmaceutical Society have, on more than one occasion, taken steps to have it included, but the *Privy Council* have not consented.—I am, yours, &c., JOHN C. WIGGIN,

Ipswich, October 15, 1894. *Pharmaceutical Chemist.*

DEFUNCT EMERSONISM AT THE SALON.

To the EDITOR.

SIR,—I have often been surprised at the virulence expressed by upholders of sharp, diagram-like photographs against the men who have done, and are still doing, so much towards making an Exhibition like the Salon possible. Jeering only hides ignorance, and surely we should be generous enough to own that, however unintelligible the works of Messrs. Maskell, Bryant, Davison, & Co., may appear to criticisers of photographs like "Definition," they are all efforts in a right direction.—I am, yours, &c., IMPARTIAL.

October 16, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted half-plate French portrait lens (old one will do) in exchange for eight volumes of the *Photographic Journal*.—Address, S. SIDEY, 35, Richmond-road, Dalston, N.E.

Wanted short-focus achromatic lens (two to one-inch focus) in exchange for three Lancaster's quarter-plate double metal dark slides; also whole-plate lens or eight-inch condenser for complete set of fifty astronomy slides in pine case.—Address, T. RICHARDS, 22, Merton-street, New Swindon.

Will exchange a good six-inch burnisher for a Theo hand camera, or an eight-inch burnisher for any other good hand camera.—Address, H. LATHAM, 220, Fletcher-street, Bolton, Lancashire.

Whole-plate Wood's washer for plates and prints, perfect condition, will exchange for 12×10 double dark slide.—Address, F. SHEWARD, 91, Northumberland-park, Tottenham.

Wanted whole-plate or 10×8 rapid rectilinear or portrait lens by a good maker, in exchange for quarter-plate hand or stand camera, fitted with eighteen single slides, fine lens, time and instantaneous shutter and finder—a good, sound instrument. Photograph sent.—Address, WM. HOLMES, 136, Derby-road, Heanor.

Wanted half-plate wide-angle lens; will exchange Marion's five-guinea embossing press and extra dies for cabinet and *cartes-de-visite*, in perfect and new condition. Address, W. WALKER, Scotholme, Nottingham.

PHOTOGRAPHY AND MEDICINE.—In surgery, how useful a good photograph is to show the beneficial effect of the operation! Of course, one should also be taken prior to the operation. Both in hospitals and private practice, medical men should take as many suitable photographs as possible, and preserve them in a convenient book, *together with notes on each case.* They would find the collection of real assistance, besides being of great interest. Only the affected portion of the body need be photographed in many instances. In dislocations, how useful photography would be! Medical works might be embellished to a much greater degree than they are by first-class photographic productions. Books on anatomy might be rendered of far greater value by photographs from the real body, instead of engravings from drawings only, such as are now in vogue. How very superior a photograph of a good dissection would be than a mere drawing of the same, and how absolutely true! In countless other cases photography will be found to be of great utility. A good magazine hand camera will be useful when the work is to be done quickly; but when photographing still objects, such as dissections, &c., one of the ordinary cameras would be best, say half or whole plate.—*Photographer's Record.*

* Section ii., Pharmaceutical Act, 1868.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

Harry Marriott, Peterborough.—*Photograph of J. A. Robertson, of Peterborough.*

Herbert Wragg & Son, Wigan.—*Two photographs of the Rev. Canon Bridgeman, Rector of Wigan, Lancashire.*

Arthur Simmons, 258, Westminster Bridge-road, S.E.—*One photograph of the members of the Terriers Association.*

Herbert Houghton Wragg, Leigh, Lancashire.—*Two photographs of the opening of the Leigh Free Library and Technical School by the Earl of Derby, September* 26, 1894.

Joseph Robinson Clarke, Thirsk.—*Three photographs of the railway accident at Castle Hills, near Northallerton; and one photograph of White Horse, Kilburn, near Easingwold, Yorks.*

M.—Received.

P. PAYNE.—The only address we know is Dorey, Lester, & Co., Kilburn, N.W.

H. C. HEMMINGWAY.—Many thanks. You will see that we have referred to the subject elsewhere.

E. SEAMAN.—Judging from the results, the apparatus must be very excellent and worth protecting.

REFLECTIONS.—There is no way of avoiding reflections from the large plate-glass window. You must select that position which gives them in the least offensive form.

V. C. BAIRD.—Thanks for your enclosure. The claims of Schulze to be considered "the inventor of photography" have been noticed in former numbers of the JOURNAL.

A. M.—Mr. W. Tylar, of Birmingham, can, we believe, supply you with dry collodion plates. Collodion emulsion for transparencies is supplied by Mr. W. Brooks, Reigate.

H. CROWTHER.—If the negative forwarded is a sample of the others, they are of no use as they are. The best prints from them will be obtained on bromide paper or gelatino-chloride. If, however, the negatives be intensified, judging from that sent, they may be rendered serviceable if not really good.

ST. GEORGE.—The apparatus in question answers very well for amateur work, but is scarcely equal to the requirements of the professional photographer. If you think of taking up collotype as an adjunct to your business, we think you would find it better to work with glass plates and a press of the usual kind.

T. A. KNIGHT.—We answered a similar question about photographing the Lord Mayor's Show last week—which see. It is impossible to say where the best light will be found. If, however, the wind is blowing from the west, it is probable that the light will be better westward than it will be in the city.

T. J. W. writing anent our remarks on the latest phase of the "coupon system," says the thing is only practised for a few days at a time by the same people in a neighbourhood, and that the fraud is not found out till some time afterwards.—We can only say again, it is a matter for the police. One or two prosecutions would check the swindle.

C. JAMES.—If the sun no longer shines on that portion of the studio that it did during the summer months, it will be well to clean off the paint that was put on the glass to stop out its direct rays. More light will then be obtained during the winter, and the paint can be restored again in the spring. Thin muslin blinds, if any, are required, which is doubtful.

NOBIS says: "Will you kindly inform me how to compound the metol developer, substituting the contents of a tube of metol for the quantity, viz., sixty grains, given in a recent number of the JOURNAL, for I have a stock of the tubes in hand?"—In reply: We do not know the exact nature of the contents of the cartridges, hence we fear we cannot make any suggestion.

A. R. E.—The best way to acquire a knowledge of artistic posing is to study the work of our best portraitists, much of which can be seen in the shop windows. Much may also be learnt from a visit to the exhibitions now open. The Central Club's scheme of an exhibition of the rejected from the others fell through, or you might have had the opportunity of seeing perhaps what to avoid.

B. W.—If the prints were supplied on "sale or return," the vendor will have to take them back notwithstanding their fading. That was not caused by the one to whom they were supplied, but rests with their production. Return the pictures with the money for those sold, and dispute any further indebtedness even in the County Court if necessary, though such an event is not at all likely.

N. M. O.—We should not recommend the purchasing of "job lots" of old dry plates without trying a sample first, particularly from houses that are now defunct, except at a price that would warrant the risk. It must not be assumed, however, that because houses have no longer an existence the plates issued by them were inferior. It must be borne in mind that gelatine plates, even of the best make, do not improve with age.

T. SEAGER complains that, after he has sat at retouching for three or four hours, his eyes get so bad that he is obliged to leave off and rest them. He adds that it is only during the past year that this has been the case, and, as he is not yet forty, he does not think that he requires spectacles.—There is very little question that he does, though. We should advise him to consult an oculist and not try his eyes further without getting advice.

E. A. D.—Messrs. Marion & Co. can doubtless supply what you require. We do not know the firm you name. We have not heard before of any firm of plate-makers giving thirteen plates for a dozen. Is not your experience exceptional? With regard to exhibitions, simply send in the pictures in accordance with the regulations which are usually published some time beforehand, or write to the Secretary of the Society that is to hold the exhibition for particulars.

P. PHILLIPS.—We doubt if it will be worth the trouble to make the pyroxyline yourself for the few ounces of emulsion you are likely to use during, say, a year. What we should advise is to get a few samples from different sources, and, when a suitable kind is found, secure sufficient to make up enough plain collodion to satisfy your probable requirements for a year or so. That procedure will probably save you a deal of trouble and uncertainty, as you appear to be somewhat a novice in emulsion work.

G. W. H. writes: "If a photograph of, say, a showcase containing a number of photographs is registered, would it secure the copyright of each photograph the same as if each was registered separately? Why I want to know is, I have a number of photographs of wood-carving I wish to secure the copyright of, and to register each separately would be expensive. Will you kindly give me your opinion in next JOURNAL?"—If the photograph of the showcase was made copyright, it would be a good copyright as a whole; but, as the contents are a number of different and distinct photographs of various subjects, we doubt if the copyright in them, individually, would be secured.

D. McP. writes as follows: "I often hear that collotype and other photo-mechanical work is done more cheaply and better abroad than it is here, and, as I often have to get collotype prints of machinery done for some of my customers, I shall feel obliged if you would give me the names of some Continental houses whom I could write to for prices. We all want to make as much profit as we can, you know."—Our correspondent's last sentence, no doubt, has much truth about it. Had he read our remarks a few weeks ago, he would have seen that English houses can now compete successfully with foreign ones in the matter of collotype work. As it is against our rule to recommend any particular houses at home, the same holds good with those abroad.

B. A. (Cambs.) writes: "Herewith, please find a couple of carbon pictures on which I shall be glad to have your opinion. You will see the surface of them is covered with a white kind of film that quite destroys the brightness of the image, and gives it an objectionably dull appearance. Sometimes I am not troubled with this, although no difference, so far as I am aware, is made in the working. It cannot, I imagine, be due to the tissue, as it is the Autotype Company's make; and, moreover, I have had dull prints and bright ones from the same roll of paper."—The cause of the trouble is not far to seek. The washing of the prints after the alum bath has been omitted, or very imperfectly done, and, as a result, the alum has crystallised out of the film as it has dried. The tongue is sufficient proof of the fact. The prints can still be made perfect by washing them.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1799. Vol. XLI.—OCTOBER 26, 1894.

QUICK PRINTING BY AID OF A LENS OR MIRROR.

Photographers are often sadly troubled in attempting to get a few proofs printed during dull, heavy weather. True, when it comes to the very worst, printing on bromide paper by an artificial light, with subsequent development, may be had recourse to, and sometimes very charming productions are to be obtained in this way. At present, however, only a limited number of the fraternity appear to adopt this system, the great majority by far preferring to print out.

When the negative is one of great density, it is no unusual thing to have to keep it in the printing frame a whole day, or even longer, in order to obtain one good print, this, of course, depending on the duration of the day and the power of the light, both being important factors towards the close of the year.

A few days ago we were desirous of making a print on albumenised paper from a dense negative, and found that the exposure required would be longer than we could then afford time for. Could there have been any method of concentrating the feeble light of the sun, the printing would have been effected in the desired time. Thinking over this, we recalled quite a number of experiments made many years ago in this special direction. Having recorded them at the time, and having no occasion to repeat them, they had slipped our memory until under the circumstances mentioned they were recalled, and have been put into practice with the most gratifying results.

It is only repeating the tritest of trite dicta when we say that the greater the intensity of light the quicker will the printing of a proof be effected. Our earliest experiment with the view of concentrating light was made on lines similar to those pursued with the idea of obtaining concentration of heat by the solar rays, viz., by the interposition of a crossed biconvex lens six inches in diameter. A number of trials were carefully made with two similar negatives, obtained in a stereoscopic camera and cut asunder. These were each exposed in a printing frame, one being exposed to the direct beams of the sun without hindrance, while with the other the rays were concentrated by transmission through the lens alluded to, which was held at such a distance from the negative as just to suffice to illuminate the portion required for mounting. Several *carte* portraits vignetted were also tried at the time, and with a still more marked effect in abbreviating the exposure.

For vignette printing, concentration by a lens offers special advantages. The great artistic sin committed in the production of such prints, as we have so often pointed out, consists in printing the bust with the same or even greater force as the head, and then allowing the figure to merge with suddenness into the white ground; whereas by the lens the condensed circle of light need not be much greater than to embrace the head and neck for the primary or predominant printing, a slight subsidiary exposure being given to more of the figure by the simple expedient of slightly decreasing the distance between the lens and the negative. Very charming results are capable of being secured in this way; in fact, the lens may thus become a powerful artistic tool in the hands of any one possessing taste and art knowledge. Local effects, too, can be produced in a way quite incapable of being otherwise obtained, except by a tedious masking and working upon the negative.

Concerning the reduction in the time of exposure, we find that, when using the six-inch lens spoken of, the time of printing is reduced to one-fourth that required without such an adjunct. In practice we obtained four good prints by the aid of the lens during the time one was secured without it.

But this was effected by the agency of what in these days of cheap and good glass must be considered as a lens of really no great diameter, after all, viz., six inches. We have just repeated some of these comparative experiments with a fine reflector eighteen inches in diameter, procured for another purpose, and of short focus. Both surfaces are ground and polished, and it is silvered on the back. The amount of light reflected is very great, and when the sun's rays are brought to a focus upon a suitable vessel of water it causes it to boil very rapidly. The area of one is nine times that of the other, and the negative capable of being illuminated is proportionally greater. When we tried the great concentrating power of this reflector upon a small print, the paper was blackened ere we had got the companion printing frame properly placed in the window. The giant's power was there, but it was not properly controlled.

It need scarcely be said that no experienced printer would think of using such a power as that indicated, in season and out of season, as he knows that better prints are invariably obtained when the reduction of the silver in the printing paper is slowly effected; but there are many occasions on which a strong, quick light will be appreciated, and for such occasions we can strongly recommend the aid of a lens or a reflector. The best form of lens is a crossed one, although a plano-convex also answers. A crossed lens, it need scarcely be explained, is one in which both surfaces are convex, one being more so than

the other, in the proportion, roughly, of one to six, the most convex side being turned towards the sun.

With a large lens, or a mirror, exceptional care must be taken not to allow anything to approach near to its focal point on account of the great heat engendered. The heating power of the solar rays depends upon the diameter of the lens by which they are condensed. Some idea of this may be had from the statistics of the burning-glasses which at one time were more in use than they are at present. That of Parker, of Fleet Street, *e.g.*, with an aperture of thirty-two and a half inches, when its rays were concentrated by a second lens which reduced the focus to five feet three inches, and the image of the sun to half an inch, could melt twenty grains of silver in three seconds and ten grains of platinum in the same time. Bar iron and cast iron also succumbed after a nearly similar duration in the focus. The effect of such a degree of heat upon the negative paper if brought near to the focus may be conceived.

MISTY AIR IN PORTRAIT PHOTOGRAPHY.

Since the famous medalled photograph, *A Misty Morning on the Wear*, brought home to photographers enamoured of the old crisp and clear print that a mist in the air was by no means inimical to the production of beautiful photographs, many landscape workers have set themselves to encounter the fog fiend, and have now and then obtained a notable success, so much so that there is a possible danger of travelling to the opposite extreme, and taking photographs under atmospheric conditions not capable of being utilised for the beautiful, and obtaining effects which are simply raw and deficient in either tone or transparency. But, when portrait work is in question, it would be simply futile to ignore such conditions, and absurd to attempt a certain class of portraits so long as they existed. Judging from many photographic portraits that we see at this time of the year, sufficient regard is not paid to the bad effect of even a very slight amount of fogginess in the atmosphere. The unfortunate dweller in the metropolis unfortunately is too familiar with fog in more respects than one, not its negative fogging capacity, but its light-absorbing powers.

It may be said at the outset that, under ordinary conditions of illumination, it is utterly useless to attempt groups or full-length portraits when the atmosphere is in the slightest degree hazy, whether in studio or out of doors. If a portrait must be done—few professionals nowadays care ever to turn a sitter away if it can be avoided—the only resource is to take a portrait of such a character that the space between lens and sitter is reduced to a minimum. The way to bring this about is to use lenses of the shortest foci permissible under the circumstances, and it is remarkable how great a superiority a picture taken on a foggy day with a short focus-lens will possess over one which has been produced with one of what may be spoken of as of more normal focus. Failing this, the familiar vignetted bust should be almost forced upon the sitter. If due attention is more commonly given to these conditions, and their value truly appreciated, we feel confident that a great improvement in average winter work would be seen.

We alluded to ordinary conditions of illumination in making these strictures, for here a very great deal may be done to influence the results for good. It is not fog, *qua* fog, that causes our portrait negatives to be so deficient in transparency in the shadows; it is the fact of the fog being illuminated that causes the evil to be brought about. Place on the foggiest day possible a lens at one end of a narrow black velvet tunnel even twenty feet long, and the sitter's face, say, a foot from the other end, and pictures equal to any taken in the brightest of weather would be produced, when, without such an arrangement, any portrait negative would be absolutely useless. Of course, such a plan would not be practicable, but a modification embodying the same idea could be easily and inexpensively devised. Failing this, such a distribution of studio blinds and screens might be made as would materially reduce the illumination of the fog particles.

There is, however, a further aspect of the subject which in view of modern improvements in artificial lighting is of vast but hitherto unnoticed importance. We allude to the electric light. As our columns will show, strenuous efforts have been made to produce a studio electric-light arrangement which should be within the reach of almost every one, and already any one whose premises are receiving the current for ordinary purposes can now have a complete studio-lighting arrangement for twenty-five pounds. What we desire to point out is that, where electric light plant is fitted to the studio, the greatest advantage it is capable of in foggy weather will only be arrived at in a studio or room into which no daylight whatever is allowed to enter. Under these circumstances, if the lighting and reflector are properly arranged, a very small thickness of air only is illuminated, and so fog is absent in the photograph let the air be ever so thick. We would impress in the strongest manner possible, upon any reader who may be contemplating utilising electricity for illumination, that the possible gain on foggy days is so great as to be almost a revelation, when due attention is given to this aspect of the matter.

It was this particular consideration that led us to writing upon this point, and especially when we had in mental purview one of the new forms lately brought out. The one we allude to is not necessary to be described by name, and the maker can at once remedy the defect we saw at a glance which entirely neutralised the peculiar advantage we are indicating as belonging to electric light. The reflector, in this form, was made of an exceedingly pretty and effective arrangement of white silk. The silken surface reflected a good proportion of light, but at the same time, when viewed from the back, was quite luminous, and consequently would in misty air illuminate the whole of the fog between sitter and lens, and so lose one of the great advantages we have pointed out. It would be perfectly simple to put an opaque backing, of light weight, behind the silk, and so increase the value of the apparatus, and with this hint we leave the matter in the maker's hands, as we leave the subject generally with our readers, with the repeated injunction to avoid every possible cause of illumination of the space between sitter and lens if bright pictures on foggy days are desired.

ENLARGEMENTS FROM COPIED PHOTOGRAPHS.

A not infrequent, though not always a welcome branch, of the photographic business is the production of enlargements from old photographs of any size, and in any and every possible condition. Provided the subject to be copied was a good photograph originally, both as regards definition and gradation, and is not much faded or otherwise damaged, the task is not a difficult one, though it generally occurs that the reverse is the case, for it only too often happens that it is the prospect of a speedy disappearance of the last traces of the picture of some

lost friend or relative that induces its possessor to have it copied.

There is another element in the question that rather increases the difficulty: the public are becoming educated in the matter of enlargements from original negatives to a point undreamt of a few years back, and are accustomed to a class of work that was then unknown, except at a very high cost. They are, as a rule, unable to recognise the difference between producing a high-class enlargement direct from a good negative, and from a reproduction from a, perhaps, very inferior print, and consequently, when an enlarged bust is required, as is not unfrequently the case, from a full-length *carte-de-visite* of indifferent quality, the photographer finds it difficult to satisfactorily explain why the result is not equal to his client's expectations.

We have had many such cases submitted to us for our judgment by both photographer and client, and in most cases all we could say was that the photographer had done the best he could under difficult circumstances, and it is really surprising how much is very often done in this comparatively unremunerative and unsatisfactory branch of the business. But such work has to be undertaken, and, that being the case, the only plan is to execute it in the best possible manner, even at the expense of a little extra trouble.

Of course the professional enlarging firm will undertake this class of work, including the reproduction from the original prints, but naturally they cannot be expected to devote any special amount of trouble to a job which comes to them in the ordinary course of business, except at a cost which would make it an unremunerative one to the photographer himself. The latter, on the other hand, especially if he be desirous of obliging a good client, as is most frequently the case, may do much himself, at little cost beyond some extra trouble, to smooth the way to success; in other words, he may, by personally seeing to the production of a satisfactory reproduction, render the subsequent enlargement, either in his own establishment or elsewhere, a matter of comparative ease.

Take, for instance, the case we have already mentioned—a full-length *carte-de-visite* portrait, from which the bust only is to be enlarged to make a 12×10 or 15×12 picture. The task does not appear an easy one; yet, with a little extra trouble in the preliminary stages, and with the aid of the "finisher," or artist, it is surprising what may be done. We have before us, as we write, just such a *carte-de-visite* of a lady, judging from the style of dress, taken at least thirty years ago, and a bust enlargement from it that, except for the style of *coiffure*, might have been made from a perfect negative of to-day, and yet there is not the least symptom of loss of likeness, or of sophistication beyond the usual marks of the artist's hand in finishing. Yet the negative from which the enlargement was made was produced by an amateur and sent to the enlarger in the ordinary way of business without any special instructions in any shape or form.

The method adopted was, we are informed, as follows: A negative was first made from the *carte-de-visite* of the head and bust only, upon a quarter-plate, the dimensions being about twice those of the original. This was carefully retouched as far as was possible on the negative, and from it a further enlarged positive of whole-plate size was made upon bromide paper of the smooth kind. This was again touched up when the positive required it, simply in the way of removing defects, strengthening shadows, and suchlike, but the chief work, both here and in the intermediate negatives, was devoted to giving sharpness to the eyes, hair, and the principal details of the dress. Such work, if carefully done, requires very little of what may be called artistic training, and not more than a very ordinary capability of using the pencil. It means little more than a carefully slavish following of the details of the photograph, converting the somewhat blurred outlines of the enlargement into a degree of comparative definition. It is not to be imagined that the task requires no skill of a certain sort, but it is the skill of common sense rather than of training, for the individual who performed the work we are describing boasts that he never had a lesson in drawing in his life, and, judging from some of his attempts at original work, we are inclined to believe him.

The enlarged positive, after being smoothed and evened to the best advantage, was once more reduced to quarter-plate size (or half-plate, we are not sure), in negative form, and this was sent to the enlarger to be made into a 15×12, and finished in the ordinary way of business. The result, as we have already stated, leaves no room to suspect that the enlargement had not been made from an original negative.

The method is not by any means a new one, for we have frequently known instances where, for special purposes, it has been considered worth while to adopt similar roundabout methods of aiming at a satisfactory result. Some fourteen or fifteen years ago there were exhibited at Pall Mall a series of instantaneous pictures of gymnasts, which attracted general attention from the exquisite sharpness of every detail of the, in many cases, rapidly moving figures. The pictures were of small size—cabinet, or even smaller, if we remember rightly—but it was commonly reported that the originals had been enlarged and touched up in the manner we have described, and then rephotographed to their former dimensions. Whatever may be said of the "morality" of such a course, if it be true, for exhibition purposes, there can be no doubt as to the quality of the final result.

On the question as to whether the game is worth the candle, little need be said; that, of course, depends upon circumstances, but the old rule stands good that, if a thing is worth doing at all, it is worth doing well. If a professional, or, for the matter of that, an amateur, undertakes a copying job, it must be because it is worth undertaking, and if he values his reputation it deserves a little care and, if needful, a little expense. In this case the extra care and expense are of the very slightest, and look greater in the description than they are in reality. In the first place, under any circumstances a negative would have to be taken, therefore the first enlarged negative can scarcely be considered as an extra, for it is practically as easy to enlarge the print to that small extent as to reproduce it the same size. Then, again, in the matter of retouching, we opine that most photographers would, under any circumstances, do what was necessary to the negative if it were to be used directly for the production of the enlargement.

All, therefore, that remains to be considered as extra labour and expense are the making of the subsequent positive and negative, with the requisite working up and the cost of the paper and plate—a matter of a few minutes and a few pence only—which, to go back again, if the job is not worth it, is not worth undertaking at all.

This method is specially adapted for the use of those who do not execute their own enlargements for the reason we have already mentioned, namely, that the professional enlarger cannot be expected to depart from his ordinary routine except

at a cost that would prove far greater to the photographer than the course we have described; besides which, in executing the preliminary work at home, he has the security of knowing it is performed to his satisfaction. But, even in cases where the enlargements are made on the premises, instances may arise where a better result will accrue from the adoption of some such system than from enlargement direct and subsequent working up.

The Benevolent.—We understand that it is proposed to ask the Council of the Royal Photographic Society to undertake the administration of the Photographers' Benevolent Association Fund in future. We presume that, besides the Council's willingness to undertake the matter, the acquiescence of the Registrar of Friendly Societies will be necessary? If the transfer is made, possibly, with the prestige of the Royal Society behind it, and under its fostering care, the Fund may find a still greater scope of usefulness before it than hitherto.

Wanted—A Name!—In the course of a review, in *Nature* of Dr. H. W. Vogel's book on *The Optics of Photography*, Professor Raphael Meldola has the following remarks:—"We are much in want of some term to distinguish the scientific student of photography from the ordinary camera-carrying picture-taker. The relationship between the two classes is much about the same as that between the bird and animal-stuffer and the 'naturalist,' whose designation he adopts. The designation 'luciscribe' is quite as applicable to those who practise the art only, but it does not seem sufficiently harmonious to suggest its adoption."

Photographic Inventors of To-day and in the Past.—Once upon a time, when photography was young, if anything new was discovered or invented, it was usually given freely for the use of all, as the literature of old will show. Now, if the slightest thing of novelty is invented, it generally forms the subject of a patent. At one time the annual number of patents taken in connexion with photography was but a dozen or so; now it reaches hundreds. Is it that the present-day photographic inventions are more necessary than those of the past? It would certainly seem so. It is really astonishing the number of patents that have been taken out during the last two or three years for the same things, many of which were really old many years before. As a rule, very few patents, indeed, are taken by professional photographers; they are principally obtained by laymen. Not a few of the modern patentees are described as "Gentleman," "Clerk in Holy Orders," "Rev.," &c.—in fact, of almost every profession or calling but photography. This shows the spread of photography.

British and Foreign Progress.—All must be gratified that our recent remarks on commercial photographic progress at home and abroad have given publicity to the fact that one English firm, at least, has had the enterprise to photograph the works, paintings, and sculpture in some of our National collections. This work has hitherto been left almost entirely to foreign houses, except, perhaps, a few isolated subjects here and there. In our last issue, Mr. Macbeth attributes, as a reason why so much photogravure work is sent abroad for execution, the "bad old principle of buying in the cheapest market, regardless of any consideration except immediate profit." We strongly suspect, however, that this is not entirely the reason, because the French and German houses we had in our mind at the time of writing, and whose work we are all familiar with in the windows of the highest-class print-sellers, charge very much higher prices for their work than those quoted by the best English houses. That low-priced work is executed abroad there is no question, but that does not apply to the class of work referred to: hence we must, we think, seek some other reason beyond *cost*. As foreign process and collotype have been superseded by those of home production, so we hope soon to see Continental photogravure supplanted by English.

Sepia Colour.—Just now there is, as the Exhibitions show, an increasing taste for brown tones in photographs, and the term sepia colour is almost invariably applied to such pictures quite regardless as to whether they resemble that pigment or otherwise; more frequently than not, it is otherwise. At a recent meeting of one of the metropolitan societies, some specimens were shown "to prove that sepia is a colour in itself." Sepia is what may be termed a natural product, inasmuch as it is obtained from the "ink," or dark fluid, secreted by *sepia officinalis* and other varieties of cuttle-fish. The contents of the "ink bags" are concentrated, and the result is the crude sepia of commerce. This is afterwards purified for artists' use. One of the peculiarities of genuine sepia, like that of the finest Indian ink, is the ease with which it can be applied as "washes" in painting. Vandyke brown was, at the meeting alluded to, described as a compound of sepia with other pigments. Like genuine sepia, genuine Vandyke brown may be classed as a natural product, it being obtained from a bog earth. It is doubtful, however, if either real sepia or Vandyke brown finds a place in many colour boxes. Be that as it may, sepia is a distinct colour, and it is quite a mistake to class every brown photograph as "sepia," when it may be quite a different tint.

Is it Injurious to Health?—An evening contemporary, that throws its columns open to queries and answers on every conceivable subject, often contains some highly amusing ones, particularly those relating to photography. Here is a sample which appeared lately:—"*Photography.*—I work in a room which is heated by hot-water pipes to 86°, five gas jets burning all day; five of us work together, standing all day long; nitrate of silver, acetic acid, and nitric acid enter largely into the manufacture of the paper. Is this in any way injurious to health? After working two hours, I find it essential to have a cup of tea to liven me up, or else I feel depressed and low-spirited, and have a severe headache. In this way I have tea five times a day. Is this mode of life likely to cause any serious injury now or in the future, and does working on white paper affect the sight?" The replies given were to the effect that the conditions of working were not conducive to health, unless the apartments were well ventilated, when they would not be, &c. One of the replies winds up with the following: "But, if you require five cups of tea a day, I say, 'Cut it.'" It would be interesting to know the establishment where five people work "standing" all day in a room heated to 86° Fahr., with five gas jets burning, and where "nitrate of silver, acetic acid, and nitric acid enter largely into the manufacture of the paper."

"Daily Telegraphic" Photography.—The "largest circulation" of a week ago had a profound article on photography, the drift of which may be gathered from the concluding sentence: "Photography, in fine, may be considered as the maid-of-all-work or slavey of the indifferent artist; but it can never rise to the status of a tutor or a guide." What have our excellent friends of the Salon to say to this? As Mr. Davison phrases it, "It is very Telegraphese." The article, among other wonderful statements, contains the following sapient appreciation of photogravure: "The only direct harm which photography has done to the engraving of large plates has been effected by the process known as photogravure, an empirical and tasteless substitute for the genuine work of the engraver." Photogravure may to some minds be tasteless, but where does its "empiricism" come in? The *bonne bouche* of the article, however, lies in the statement that "it is quite erroneous to suppose that the sun, when its rays are transmitted through the lens on to a sensitive plate, is invariably truthful; on the contrary, if a figure be badly focussed, the orb of day becomes indirectly a very Ananias, which makes your hat four times as big as your head, and your little finger thicker than your thigh." On the whole, our contemporary is more at home in discussing the vagaries of "prudes on the prowl" than in treating of photography, which it obviously does not understand a little bit.

Fading Photographs.—It is really astonishing how little compunction photographers have in exhibiting in their show-cases manifestly rapidly fading pictures, as witness the frames to be seen at most of the railway stations throughout the kingdom, as well as in their shop windows and doorways. A large number of the local views of neighbourhoods, shown by stationers and the like, are, we are told, supplied to them on sale or return. The returns through fading, we suspect, must be large if one may judge by the number of jaundiced prints sometimes to be seen in the windows at some places, even in London. Perhaps a greater variety of fading portraits are to be found at the entrances of theatres, music halls, and such places, than anywhere else. The *artistes* are taken, in or out of character, while on *tour*, in different parts of the country, and the pictures are frequently shown as advertisements outside the establishment at which they are engaged. We have just now in our mind a frame of a dozen or more portraits of an *artiste* now being shown at a London theatre. They are by various photographers in different parts of the country, and, with one or two exceptions, they are all in various stages of decay. This is a sorry advertisement for the photographers whose names they bear, and not a very bright one for those portrayed. It would almost seem that now fading photographs are not looked upon by photographers in the same light as they once were.

RESTORING STAINED NEGATIVES.

It was my misfortune a few days ago to have a number of printing frames caught in the rain towards the end of the afternoon; they were taken in; and, after every care had been apparently given to them, they were left until next day, when it unfortunately proved that two of them had either during their exposure or in the course of the night, got the wet in between negative and paper. This was all the worse, because the paper was albumenised, and the discovery was not made until they had been again exposed to light for some time, and the silver absorbed by the negative films had had time to produce a very pronounced stain on the surface of the gelatine.

The pertinacity with which albumen paper adheres to a negative when it once becomes attached through damp is well known, but I managed to get it away in both these cases, only to find both negatives badly marked; and, as both of them were rather important, I placed them in a strong solution of salt to at any rate arrest any further change until I could decide what was best to be done next. I was anxious to save them if possible, and, as I knew that in their then condition they were pretty certain to get worse on further exposure to light, I went into a series of trials on spoilt plates to ascertain the best method of treating them.

Pieces of blotting-paper soaked in weak solution of silver nitrate were placed in contact with the films for two or three minutes, until the gelatine had absorbed some of the moisture and silver, and the plates were then exposed to light until a palpable discoloration was visible. They were then washed, immersed in the salt bath to convert any remaining free silver into chloride, and some of them put away to dry, others being treated wet.

Of the latter I had not much expectation from the first of recovering them, or removing the stain, because the silver forming the stain seemed likely to resist any merely chemical treatment as strongly as the image itself, and to be as permanently fixed, so that, when, after treatment with hypo, followed by a thorough washing, then bleaching with cupric chloride and redevelopment, the stains were rather intensified than otherwise, I was not greatly surprised.

I then turned my attention to the dried plates, the stained portions of which were carefully polished with a pad of flannelette, kept moist with methylated spirit. Under this treatment the visible stain in one or two cases disappeared entirely, and in all it was materially lessened, though the difference in behaviour showed how much more strongly the same, or practically the same, treatment with silver had affected different films. In those cases where friction entirely removed the discoloration, the effect was evidently only on the surface, whereas, in others, it had been more or less absorbed into the body of the film. The method I adopted in impregnating the film with silver, and producing the stain, was probably more thorough in its action than the contact of moist ready-sensitised albumen paper, which is not particularly strong in free silver as a rule.

After obtaining all the result I could by friction, the plates were placed to soak in clean hypo for half an hour, and this treatment still further reduced the stain in all cases, and in one or two, where the remaining discoloration was not great, it practically removed it, or left so little that it was scarcely of any printing value, and therefore no detriment to the plate. One or two attempts were made to further reduce the stain by partial bleaching with cupric chloride, followed by hypo, in the hope that being more confined to the surface the stain might give way before the image; but it proved that, where the free silver had got a hold of the gelatine, it held it as tenaciously as the image itself—indeed, the image seemed to suffer reduction to a greater extent.

Applying the same treatment to the two negatives that led me to these experiments, and which, by the way, were not so badly discoloured as the specially prepared test plates, the stain was almost entirely removed by the friction with alcohol, so little being left that it would not materially have affected subsequent printing unless further exposure to light had again intensified it. That, however, was what I feared, though it would have been better, as it proved, if I had "let well alone."

These two negatives were then submitted simply to the same treatment as the test plates, and the first one passed through the ordeal successfully, and came out practically without any traces of the original mishap. The second one, however, after immersion in the hypo for only a few seconds, almost entirely disappeared, so far as the image was concerned, or became so thin as to be utterly useless for printing purposes, the only portions that retained any printing strength being *the stains*. For a few moments I was quite at a loss to account for this difference in behaviour, until I remembered that that particular negative had been intensified with mercury; hence the result. After bleaching and redevelopment, the stains still remained the most prominent features in the film.

An interesting variation in the course of my test trials was a plate that had evidently not been freed from hypo before submission to the silver treatment, as before exposure to light it became marked with brownish yellow stains entirely different from those produced by the mere action of silver on gelatine. In this case, after bleaching—not with cupric chloride, but with potassium bichromate and hydrochloric acid—the image was reduced by means of a very weak solution of sulphide of ammonium, which reproduced a colour that very closely matched the irregular stains first noticed.

The result of these experiments shows, I think, that in cases where damp gets to the negative when in contact with silvered paper, if measures be taken in time, even after a visible discoloration has appeared the evil may be stopped or even removed. The harm is only done by delay, for, if prompt measures be taken, no discoloration need occur. I have frequently, when damp has got into a printing frame, taken the negative out at once and placed it in salt and water, and afterwards hypo, and have never had any more trouble; but after exposure to light, or lapse of time, when actual discoloration has taken place, stronger measures become necessary.

W. B. Bolton.

ROYAL PHOTOGRAPHIC SOCIETY.*

President's Annual Address.

Photography's Services to Art—"The Newest School."

And, if photography, as a most potent instrument of research, has rendered such valuable aid to science, what are we to say about her services to art? The general question of the reciprocal influences between art and photography is a large and a thorny one. It is one which it requires some courage to approach. Some of the advocates of the newest photographic schools are endowed with abundant powers of invective and characterised by considerable readiness to employ those powers for the benefit of anybody who does not wholly agree with them. It is, therefore, unwise for any one to touch the subject of art and photography who has not thoroughly qualified himself to deal with it,

* Concluded from page 663.

and who is not besides either indifferent to criticism or capable of vigorous retort. Nevertheless, perhaps the opinion may be timidly and cautiously hazarded, that art has learnt more from photography than photography has from art. Familiarity with photographic truth has rendered the general public impatient of incorrect drawing, and has, I think, beyond a doubt, considerably raised the standard of general average in art, while such work as that of Muybridge, Marey, and Anschütz has given artists new ideas, and more correct information as to the manner in which the actions and postures of living creatures can truthfully be represented. Though artists are none too prone to admit to admit it, I am convinced that they have learned a good deal from photography.

On the other side, there has undoubtedly been of recent years very considerable progress in the application of photography as a means of artistic expression. I am inclined to think that the actual amount of progress has been over-estimated, but it has certainly been great. It is due, I think, partly to the generally increasing knowledge of and love for artistic matters; partly to improved methods by which results can be obtained unattainable by older processes; and partly to the influence of a certain number of men of considerable and real artistic power, who have devoted themselves to the object of producing, by photographic means, pictures comparable with those produced by the pencil and the brush. *Vixere fortes ante Agamemnona*, there have always been some workers of this class, but lately they have gathered themselves together, and have formed a school the influence of which has distinctly done a great deal to raise the artistic standard of the photographic pictures now exhibited in public.

While fully acknowledging the debt we are under to the professors of our newest school, I cannot help the feeling that they are not working in the right direction. Instead of utilising to the utmost the special powers of their own instrument, they are always trying after effects which are better produced by other means. They are apt to be misled by imperfect analogies. I cannot venture to offer any opinion as to whether impressionism in art is right or wrong, but I cannot bring myself to believe in photographic impressionism. A painter may suggest, he may indicate what he means, and the imagination of the spectators does the rest. The indistinctness of a photograph can only conceal. You know that the thing itself was actually there, though in the picture it may be smothered in fog, and imagination is stifled instead of being aroused. I believe, however, that the modern craze for indistinctness is merely a natural reaction against the uniformly minute delineation which is, of course, a natural characteristic of photographic pictures. The pendulum has swung a little too far, and it will come back directly in the ordinary course of events.

There is, however, one development of photography the value of which artists ungrudgingly admit. They all declare that the most remarkable recent achievements of photography in this direction of art have been, not in the production of original pictures, but in the reproduction of pictures previously existing. And this is, I think, true, whether we consider the reproduction of artistic masterpieces by the most perfect of modern photogravure methods, or the reproduction of an artist's newspaper sketch by the most rapid of modern processes. Nearly all reproductive art (I mean the reproduction of original work) has become photographic, and in a few years more all of it will have become photographic. The bad old joke about the "foe to graphic art," while retaining its badness, has lost its truth. The ancient foe is now a most useful and devoted friend.

Photo-mechanical Illustrations.

You all know how great has been the progress in methods of photogravure, so that better and more truthful representations of a picture can now be obtained by its aid than by work of any but the best and most skilful engraver, or even, when absolute accuracy is essential, better than by the work of such a one. You know also how, for the illustration of books and newspapers, photographic methods have superseded all others, not indeed by producing original pictures, but by affording the best means of reproducing the illustrator's work. And I suppose, for such purposes, photography must always occupy this position as a means of reproducing an artist's work, rather than as providing a substitute for the artist's work. When accuracy of delineation is the most important point, whether in portrait, landscape, or what not, the picture produced wholly without the qualifying intervention of the artist must hold its own. When truth is less important than beauty or attractiveness, the skilful artist has generally the advantage. In a limited number of cases the scene or object is good enough without his aid. Then the photographer is on equal terms. In most cases a transcript, however skilfully made, is not sufficient. Then the photographer has not a fair chance.

And, of course, mere printing difficulties still handicap the purely photographic block, at all events in newspaper work, so that the work is most satisfactory when photography is employed only in the first and last stages of the work, in recording, it may be, the scene, and in reproducing the artist's version of the record, the intermediate portion being carried out by the skilled craftsman.

I must, however, make this remark. The vilest of the many vile pictures to which we are treated nowadays by the superabundant energy of newspaper illustrators are the result, not of pure photography, but of a combination of artistic idleness and photographic carelessness. The artist makes a wash drawing quite unsuitable for reproduction, and the photographer turns it into a gruesome combination of spots and smears, a hideous example of mechanical impressionism. When I see these things I am always sorry to think that photography has been debased to such mean ends.

The facility of reproduction which photographic methods confer is, as it seems to me, very far from an unmixed blessing. I cannot see what advantage the newspaper-reader enjoys from having the pages of his journal filled with trivial and uninteresting sketches, unless, indeed, it be the advantage that he is saved the trouble of perusing an equivalent amount of letterpress. The American newspapers are great sinners in this respect. The skill and energy displayed is wonderful, but the result is disproportionate. The thing is overdone. There are, of course, numerous instances in which a sketch, however slight, affords more information than an elaborate description, but the number of such cases is limited, and, once it has got to be the fashion to fill the columns of a paper with sketches, it is inevitable that the subjects of most of the sketches must be trivial. Our own papers show a tendency, in many cases, to follow the same lead, but not as yet to the same extent. Still we who are interested in photography cannot but wonder and admire at the progress which has been made of late years in this application of our art, a progress all the more remarkable that it has been attained, not so much by the discovery of new principles, or the invention of new methods, as by the application of increased skill and ingenuity to methods some of which are in principle as old as photography itself.

Improvements in Photographic Methods.

As regards any improvement in photographic methods, we have, I think, rather to chronicle steady progress than any marked or distinct advance. I do not know of any special addition to our knowledge of photographic chemistry, unless it be the fact, discovered by Professor Dewar, that photographic action seems not to be stopped by the lowest temperatures yet produced by human means. Professor Dewar came to the conclusion that it was still carried on, though reduced to the extent of more than 80 per cent., at a temperature of 200° C. For instance, "chloride of silver paper, sponged with liquid oxygen and exposed to bright light, quickly turns brown except where cooled, little or no action taking place at that spot."*

It does not indeed appear quite clear whether the action was not delayed till the cooling effect had passed off, in the case of the silver paper, or whether, in the case of the Professor's late experiment with a gelatine plate, the action was not really due to phosphorescence after the temperature had risen.

Various reducing agents have lately been added to the list of substances available for development, but I suppose a very large percentage of our negatives are still developed with pyrogallol, and the bulk of the balance with hydroquinone.

The interesting investigations of Buchner and Marshall Ward into the action of light on bacteria can hardly with justice be admitted as adding to the list of photographic materials, though we must certainly claim the "photobacteriograph" as an advance in our science, and as suggesting new directions for photographic work.

The question of sensitometry has exercised the minds of many of our most active workers for some time, but I think I may say without as yet any positive result. I believe I may put it as the opinion of those best qualified to express an impartial judgment on the subject, that, while we have certainly obtained a means of roughly gauging the comparative sensitiveness of plates, and have got a guide of great practical use to the makers and users of plates, we are as far as ever from an absolute standard, and that the attainment of such a standard must await the attainment of a standard of light, a problem the solution of which is of importance not to photographers alone.

It would obviously be unreasonable to expect that the increase of photographic knowledge should grow *pari passu* with the number of those

* The quotation is from the *Pharmaceutical Journal* of July 7, 1894, in which a report is given of Professor Dewar's address to the Chemical Society on certain effects of low temperature.

who practise the art; but I think it is certainly a matter for regret that of the many thousands who have taken up photography as a pastime so very few pursue it in a serious way or in a scientific spirit. The popularisation of photography has indeed, to my mind, been a drawback to real progress. The process of picture-making has been rendered so easy that it has been deprived of much of its interest, even to the merest amateur in science, and the attention of those who might have pursued photography seriously has been diverted to other branches of science. Still we are fortunate in having, even among the younger workers, a considerable band of capable and active students who are adding slowly, but surely, to our knowledge of the scientific principles of the art.

In photographic optics there is, I think I may say, a very distinct advance now going on. The expectations of opticians have long been fixed on the productions of the Jena manufactory, and those expectations are, according to the best information at my disposal, now in a fair way of being realised. The qualities of glass that are to be obtained commercially from Jena have provided the opticians with new possibilities for the improvement of photographic lenses. Both in this country and in Germany opticians are availing themselves of these possibilities. Great credit is certainly due to Messrs. Ross, who have carried out the work of Dr. Schroeder, and have produced from his calculations the lens which they have termed the "Concentric" lens. The double anastigmat of Goerz, described last year to the Society by that gentleman, is another new lens, the outcome of the Jena improvements in glass, which ought at least to receive mention.

Mr. Dallmeyer has also made considerable advances, both theoretical and practical, in his "tele-photographic" lens, an instrument which produces results appealing at once to all who take any interest in photographic matters, and one which, in the opinion of competent authorities, is likely to have important practical applications for astronomical and other branches of scientific photography.

As to improvements in photographic apparatus and appliances, he would be a bold man who would venture to single out for special remark any of the innumerable new devices which are produced almost daily. I think there can hardly be any pursuit on the mechanical appliances connected with which more ingenuity has been lavished. Since (about 1879 or 1880) Mr. Bolas concealed a small camera in a box, and proceeded to take surreptitious pictures with it, the detective camera has had a vast amount of thought and care bestowed upon it, and it has become so common that I see Mr. Robinson (with what seems to me a curious perversity) has lately been complaining that he, in a recent Highland tour, hardly saw any. He was so used to the instrument of torture that he missed it. Marvels of ingenuity and completeness some of these instruments are. Cameras are more beautiful and more complicated than ever. Of shutters there is, of course, no end, and I dare not try even to enumerate the many miscellaneous devices which modern instrument-makers have added to the photographer's outfit. If the work is not better done than of old, it certainly ought to be, and is, more easily effected.

Photographic Exhibitions.

The announcement that the authorities of the Imperial Institute intend to hold next year a photographic Exhibition in their building at South Kensington will certainly have been welcomed by members of the Society. The Exhibition is to be a comprehensive one, including all the branches and applications of the art. It is perhaps to be regretted that the regulations of the Institute do not permit of the Exhibition being made an international one, but I hope that it may prove thoroughly representative of the state of the art in the Kingdom, or rather in the Empire, since the Institute deals specially with colonial matters. That a good collection of pictures will be shown may be taken as certain, but I hope that makers of apparatus will also avail themselves of the opportunity, and that all the many applications of photography to printing purposes may be well represented. The scientific applications of photography should receive special attention, as it is more difficult to secure a good show in departments where industrial and commercial influences are absent.

I had intended to say something about photography at the great "World's Fair" in Chicago last year, with the British section, of which I was, as many of you are aware, somewhat intimately connected. I have, however, left myself but little time for the purpose, and if I had the time I am not sure that I should have very much to say. We certainly held our own. There was nothing approaching in excellence the collection of photographs which were shown in the British section, and there was also in addition a fairly good representation of professional work. Our instrument-makers also made a very respectable display, and the high merit of some of our principal exhibitors in this department was universally admitted.

The American photographs were certainly disappointing. They were for the most part ordinary show-case specimens, and I do not think they at all represented the best American work. There was a fine show of apparatus, most of the principal makers being well to the front.

In most of the other countries not much attention was paid to photography, though I ought to mention some magnificent enlargements (bromide, if I recollect right) shown in the New South Wales Court, as illustrations of Anstralian scenery and architecture.

LEGITIMACY OF HAND WORK IN PHOTOGRAPHY.

[Photographic Salon Conferences.]

Photography, properly so called, has, as a graphic art, theoretically no limitations save that of colour. Every possible gradation of tone, from black to white, it can produce; and every complex figure it can delineate. Its means of expressing sunlight are not more restricted than that of any other monochrome method. In reproducing, in representing facts, it stands paramount and unsurpassed. That photography cannot be untruthful is proverbial; its fault is, that it represents more of the truth than the eye requires to remind it of that which pleased it.

This is precisely what the pencil of the artist would do, or would try to do, had he not the instinct or the training to omit. From this standpoint the photographer and the artist are on equal footing, with the difference that the photographer can do what, if he try, the artist must fail in—that is, to reproduce everything before him. Here, then, the limitation is with the artist rather than the photographer. To omit is a verb of first importance in graphic or pictorial arts. Inability compels the artist to omit; the necessity of enormous labour induces him to omit. Training would teach him to omit. Thus inability, and necessity of great labour, bring about, in this respect, at least, what the draughtsman-artist would otherwise only have learned to do by long training. Small credit to him. In this respect the artist is as much the slave of circumstances as is he who uses the camera, with the difference that the restrictions in each case are in precisely opposite directions. This limitation of the artist helps him—nay, he seeks to increase it; the position of the photographer is, that the characteristic of his methods is that they tempt him to forget, if ever he knew, the importance of omission. With the pencil, we unconsciously leave out what we do not require; with the camera we unconsciously take in what we did not notice. Supposing the photographer to have become enlightened as to this particular danger, the temptation he has to overcome, the self-restraint he has to exercise, the control he has to exert over his machine, requires a persistent effort and purpose, so high and so strong that it is little wonder few have survived the ordeal victorious; little wonder that "photographic" has become an accepted term to apply to all pictures of which the inclusion of everything is the chief characteristic, and the virtue of omission is absent. So great are the photographer's difficulties in this direction.

We marvel at the Pyramids chiefly for the difficulties which, in the absence of appliances, their builders overcame. I say that proportionately with the difficulties surmounted, there are veritable Pyramids in this gallery. I trust none will take this as satirical, though, if the prints be permanent, some may in ages to come wonder as we do of the Pyramids *why* they were made and what they signify.

"A Distorted and Inflated Form of Photography."

The great masters of painting were assisted by the tools they used, the photographer has been constantly thwarted in endeavouring to apply photography to artistic ends by the materials and tools manufactured for his use. Nor is he to blame for depending on the production of unsympathetic minds, for he has been born into an age when artists do *not* prepare their own colours nor make their own brushes. The photographer reminds me of the performers who we may have seen producing musical sounds out of the most unpromising materials, sticks of wood, empty wine bottles, and the like. So the photographer, prompted merely by love for art, is seeking to lead photography into paths whereunto, thanks to the scientific experimentalist, it seems unwilling to go. From a very complex alloy he is trying to extract the pure gold.

The photography which manufacturers and scientists have given us, which fills our journals, and astonishes the world, is a distorted and *inflated* form of the photography which the man of artistic instincts needs.

It has grown rampant wild, throwing out all sorts of branches, bearing some fruit, but fruit which is bitter to the artist and rank to the taste as a wild apple. One little simple shoot from this first root, had it been plucked in time and planted in fit soil and grafted with a bud from the proper stock, might long ago have yielded the fruit we are now so eagerly trying to cultivate.

Now, in thus deprecating the powers of photography, I am not unmindful of its excellencies; I am well aware and appreciative of its ability to render effects of atmosphere and all the exquisite tonal gradations so beloved by many. But what of these, have not these very virtues been the snare? They have been put forward as advantages which should place the artist-photographer above other artists. There is another aspect of the case.

The painter-artist has all the coveted effect even before and above him to strive after, and to gradually attain. He starts at the bottom of the ladder, and, if he ascends at all, his ascent is complete, step by step winning each quality he strives after, so that, by the time he has acquired power, he has learned how to use it, and knows how to climb.

The photographer, is, at the outset, put high up on the ladder encumbered with a great deal more than he needs, he has never travelled over the first steps, he has not learned to climb, his is the embarrassment of riches, and he is fearful of throwing away some, not having yet learned what to part with and what to keep; it is an application of the parable of the rich man trying to enter heaven.

Is Retouching Essential?

It is in this position that I find the man who first has recourse to "retouching." I use the word in its restricted and accepted sense of adding to the thickness of the deposit on the film by the addition of pencil-marking made, of course, by hand.

Attracted by some pleasing form of face or figure, fascinated by some effective lighting the photographer is betrayed, he is thrown off his guard. He photographs the pleasing form, the effective lighting, forgetful of the fact that, whilst he is doing this, the *machine*, unbidden, is photographing something else which he did not want. The excess of power forced upon him by the completeness of his apparatus and material is the primary cause of defect, which he seeks afterwards to counteract by retouching.

I suppose those defects may be all practically attributed to either exaggerated shadows, excessive detail, such as the texture of the skin, or to the incorrect rendering of colour, as in freckles and in red spots. In every case it is too much photography, it is the process which has been permitted to work its will uncontrolled. Is retouching, then, essential to a good and pleasing photographic portrait? is a question I fancy many will answer for me in the negative. It needed not the eminently important and clever examples which our Vienna friend has sent to an Exhibition hard by, to show what can be done without retouching, though, I think, never before has such a striking example been shown, or shown in such a convincing manner. I believe I am correct in saying that Rejlander not only hated, but would not resort to, retouching, and probably many here, who are better acquainted with studio practice than I am, could tell how by variation in the usual mode of studio-lighting, undesirable shadows may be overcome, possibly at the sacrifice of other qualities; but that is apart from my present question. I will further suggest, perhaps I might assert, that by diffusion of focus and colour-corrected plates the other defects to which I have referred may be obviated.

What, then, is the conclusion from this? That it is possible, by special care, by close observation, and due subordination of some of photography's excesses, to produce what, for distinction sake, I will call a picture-portraits entirely satisfactory without the aid of "Retouching."

That such portraits would not tend to increase the fortunes of the professional photographer in ordinary practice is the fault of no one but that capricious personality, the British public.

If it be conceded that retouching is not essential to the picture (or the portrait, which is a picture first and a likeness afterwards), we have only to discuss the question as to whether it is legitimate to exhibit in a gallery like the present portraits which owe some of their attractiveness, some portion of the total excellence, to the work of the retoucher.

Other Methods of Hand Work.

Judging from the experience of the two Conferences already held in this room, the most enjoyable part of the evening is the discussion or expression of opinions which follows the paper-reading, and for that reason I propose to curtail my remarks in order that others present shall contribute liberally to the evening's entertainment.

It was with this view that I selected a subject upon which so much diversity of opinion exists, a subject which never fails to be brought up on the occasion of any important exhibition, and one over which such strong feeling has been expressed that, in stirring it up now, I may show more of the temerity of the fool than the timidity of an angel.

If, however, after laying the matter before you, I can succeed in inducing others here to fight the matter out, you see how much trouble I shall be spared.

The legitimacy of exhibiting photographs printed from retouched negatives I will leave for the moment, to return to presently.

Other methods of treating by hand the finished negative must not be overlooked. The density of the film is increased by applying with brush, or other means, semi-transparent varnishes, or paint, or an opaque medium, if such be required, as, for instance, to make a shadow print print lighter or to introduce more light in a given portion, I need not particularise.

Another method, with essentially the same end in view, is to shield a portion of the negative from the light whilst printing with a piece of brown paper with an irregular hole cut in it, or some may use an orange glass with a clear space in the centre; the resulting print is called a "vignette," and is sometimes used for portraits.

In a landscape it is perhaps more usual to use a cloth or a paper with which to cover the sky portion of the negative, if it chance to be thinner than we wish, or the clouds not to our liking. Also I have known men cover the landscape for a while in order to let the clouds print out. Such methods may possibly have come within the experience of some of my hearers, and I would just suggest, in passing, that, whether we use powder, paint, varnish, paper, glass, or cloth, we are still tampering with the negative by hand; no matter the material used, or how employed, the principle involved is the same.

To push the matter further, we sometimes decide that the contrasts between light and shade are not as we would have them, and we apply to the entire negative a chemical solution, a process we call intensification. It is a convenient method, and does its work more regularly and quicker, but it is not inconceivable that in *simple subjects* we might produce the same effect by painting on the negative with exceeding care layers of a semi-transparent nature, increasing in thickness or opacity from the lower tones to the high lights. In either case we are deliberately altering the effect our simple negative gave us.

If, however, this is more than you can agree to, and would hold that intensification, being an automatic action, cannot be called hand work, I would suggest that were we to intensify just a very small portion of the negative, just one little spot containing only two or three different tones, we should do our intensification with a brush, using a varnish, a colour, or a mercury solution. Suppose the portion to be intensified extend to some considerable part of the entire negative, I should apply and guide the intensification solution either by a brush or by flowing, but in any case it is controlling it by hand, and, if the entire negative be immersed, it is only one step further; it is still hand work, inasmuch as the head decides when the negative has been sufficiently altered or "faked," and the hand stops it.

Whatever is true of the process of intensification is certainly true of reduction, whether local reduction or reducing the density of the entire plate.

Now, it seems to me that there is as much difference between applying pencil point or brush to the plate, and applying a solution calculated to entirely alter its printing qualities, as there is between using such a solution and the intelligent development of the plate in the first instance.

If the principle involved when we intensify a plate is the same as that involved when we put retouching or brush work on a negative, and if we argue that intensification is equivalent to a subsequent development, then, on the grounds that things equal to the same thing are equal to one another, I might ask you to agree to the logical deduction that retouching and development are the two things which are equal. But I see it in *this* way. The photographer who chooses his point of view to secure most even and perfect illumination, accurately times his exposure, and develops to certain standards of density, is practising a mechanical process, but the man who selects his view for its effectiveness, exposes to get a certain desired result, and develops intelligently, stopping the action here or there, and ceasing altogether, not when the plate has had its will, but when the photographer thinks fit; that man is putting hand work on his plate from the very moment he essayed to take the picture.

The Limits of Hand Work.

The photography that is not utterly and blindly mechanical, must of necessity be hand work—head and hand work, from first to last, but the means of applying the hand work differ at each stage. Is there, then,

no limit to be placed on the amount of hand work put on the negative? Yes, there is, as I will propose presently.

Many who will raise no objection to the retouching or "faking" of a negative find a stumbling-block in hand work on prints or photographs themselves. This would seem a little illogical, for surely, if faking be admissible at one stage, why not in any other? But I think we may, perhaps, find a clue to this somewhat arbitrary objection in the fact that it is exceedingly difficult to simulate, either with brush or pencil, the texture and manner of the sun-printed image, and hand work on the surface of the print almost always makes itself seen.

If the brush work be so skilfully done as to escape detection, it cannot, obviously, be a cause of condemnation; it should be, however, clearly understood that it is not the mere fact of our discovering it, not the feeling of having exposed an imposture, that condemns it, but it is, I think, this: pure photographic methods can give us every possible effect which we have a right to expect from any black-and-white method, and our "faking" will only make itself apparent when we endeavour to introduce some feature or some effect which is not in accordance with truth, or our "faking" is betrayed by our unskilful or careless manipulation. In either case the "faking" is bad, because inacurate; because it is inacurate it is discovered, condemned because discoverable, hence its condemnation depends upon its inaccuracy.

In this thought, too, I find, I think, an answer as to how far retouching, &c., may be carried, and what limit may we place upon hand work generally. That limit is reached when the hand work is untruthful, and when, instead of carrying out still further the scheme laid down by the photographic basis, it diverges into a different manner and style.

Retouching of negative, or painting on print, is perfectly admissable and legitimate when nothing is done that could not conceivably be done, with favourable circumstances, by purely unaided photographic means. But, if an exhibition be of such a character that each of the works shown carries with it an implied guarantee that it is solely the result of photographic process, then "faking" of any kind whatsoever should disqualify for admission. But such an exhibition, be it understood, would be a display of photographic specimens—examples of what it can do—and not photographs of pictorial excellence.

I do not propose to carry this matter further; a very great deal more might be said, and even what I have said might have been better arranged. For want of time and preconsideration, I have, I fancy, somewhat weakened my cause; many of the points I have referred to will have lost their strength from not having been marshalled in the best order and sequence; I must ask you, if you think it worth while, to unravel a skein of ideas which I may have twisted.

Seven Questions.

Finally, I think the matter resolves itself into these seven questions, which I shall be delighted if you will discuss *for* me:—

1. Hand work is of two kinds: first, the deliberate use of, or interference with, optical and chemical methods usually included in the term photographic; secondly, the deliberate and intelligent use of other methods not usually regarded as belonging to photography, and which for convenience we must call "photo-faking."

2. Photography can produce every and any effect which we ought to require, and hence "faking" is merely a convenience to supplement our photography; first, because of our own incompetence; or, secondly, because of our indiscretion in using our photographic means.

3. With greater skill and greater knowledge we shall be able to dispense with "faking." If our control of the photographic process had been complete and our knowledge of how certain things would come by photography more perfect, "faking" had never been necessary.

The man who can dispense with all "faking" is the better photographer, but not necessarily therefore the better artist.

4. Any interference with, any addition to, or deduction from, the simple automatic action of the entire process of pure photography is not legitimate, and is not honest in an exhibition of specimens of photography.

5. Hand work of any description on negative, plate, or completed print is admissible, though at no time desirable, so long as it does not make its presence unduly felt, because its being apparent shows that it is incongruous with the adjacent portions in tone, texture, or colour, or because it is untrue to fact in tone or form.

6. The limit of "faking" on plate or print is when it oversteps the possibility of what purely photographic methods might have accomplished.

7. Inaccuracy of tone, texture, colour, or form in the hand work or "faking," if not sufficiently great to destroy the harmony of the whole picture, regarded as a picture, whilst a cause of regret, shall not be cause of condemnation, for it should be remembered that the conception of the picture and the carrying out of the idea may denote an artistic instinct and feeling which has only failed in a perfect realisation because of the unwieldy process employed, or from a knowledge unequal to the demand occasion has placed upon it.

A. Horsley Hinton.

ON EXHIBITIONS.

[Central Photographic Club.]

I am not about to deal with chemicals, lenses, and scientific apparatus; you have amongst you so many who can speak with greater authority than I can upon these subjects. Nor am I even about to launch an essay upon my favourite subject, truthfulness and beauty, as harmoniously united in the conceptions of all true artists and poets, nor to oppose the art conceptions of certain scientific and mechanical operators and experimentalists. My subject is simply exhibitions.

Originally the main purpose of all art exhibitions was educational. Their great mission was to teach by example, and there is no better way of teaching. They inspired the student with admiration for his art, and ambition to succeed in it revealed its loftiest possibilities, glorified the names and works of its greatest masters, showed how its difficulties could be most successfully encountered, how its expressiveness could be enforced most clearly, and the full scope of its technical power. All those principles from which practical rules were evolved for beginners who had not yet learned to think for themselves come from these great exhibitions. Their importance has consequently been amply demonstrated in all times, and their popularity has been greatest wherever art has been most lovingly appreciated.

With the degradation of their purpose to the level of commercial speculations, they drifted into the new form of annual exhibitions; but of these I shall speak presently. These were never more numerous than they now are.

"The works of eminent masters," said the famous artist Opie, "can never be studied too much, but they may be studied improperly. The prime object which ought always to be kept in view, as the only means by which we can ever hope to rival them, is the rediscovery, in its fullest extent, of the principles on which they were formed;" otherwise, he adds, they tend only to create imitations and mannerisms. Rubens, who also asserted of these works that artists could not possibly "consider them too attentively, or study them too closely," also asserted that the student's main object should be, not to mechanically imitate them, but to understand them.

I put these statements in the forefront of my paper to show that its subject is worth our attention. Photographic artists, above all others, require the enforcement of that greatest lesson—Study, not Imitation. To imitate in one art, having means peculiarly its own, and processes differing altogether from other art processes, is not to extend, but to cripple, its resources. It is this difference of application that should show us how rules applicable to this art or that, although founded upon and derived from the same principles, are not suitable for universal application. The great principles which give life and character to arts the most unlike each other, in both their processes and results, are the things which crave most earnestly the attention and serious, earnest study of all practitioners who would make themselves true artists, and not mere artisans, whether their tools be brush, chisel, or camera. For such study the means are not wanting. We have noble collections of glorious works gathered from all parts of the world, in those private galleries, many of which their courteous, wealthy owners will allow us to visit; and we have world-wide, famous galleries, permanently and freely opened to students, in South Kensington, Trafalgar square, and elsewhere. All these are schools, and as schools they were originally founded. Their treasures are priceless, and every age adds to their number and value. Artists who have achieved the greatest triumphs have confessed their indebtedness to them. All the leading art academies base their teaching upon the principles discovered in them. They are the standards by which art progress is calculated, or by which its retrogression is demonstrated. No artists can afford to neglect them. Stately and dignified teachers, they cry shame on the indolent and careless. They are the power that prevents us from ever descending to that dead, dull, stagnant level of mediocrity which is ominous of decay and death. They serve us, moreover, by separating the high from the low, the true from the false, the refined and intellectual from the mean and vulgar, and they drive out from the ranks of our brave fighters all incompetent and cowardly recruits.

When you look for the earliest founders of these galleries, their pioneers, you find them amongst artists, strong, earnest, pious, sincere men, in whose hearts glowed a fervid love of their profession—hard-working men who spent their lives in their studios, each with his little band of respectfully admiring scholars. In their belief art and religion were one, as they were in ancient Greece, and in the nations that were ancient when Greece was unknown. They formed societies, under patron saints, with stern, strict laws for their proper government, holding feasts and business gatherings regularly at stated intervals, and never transacting one or enjoying the other without putting up yearning petitions or giving solemn thanks to God. So in their schools work began with

prayer and was ended in the same pious spirit. The lofty aims, sincerity, and generosity thus characteristically demonstrated found expression in those early art galleries which they associated with tneir schools or studios. And from these came the first modern permanent art galleries of Europe.

One of the earliest, if not the first, of modern galleries of sculpture and painting was that formed at Padua in the first half of the fifteenth century by an eminent painter (Francesco Squarcione), who devoted the earnings and savings of his profession to travelling and gathering together the finest specimens obtainable of ancient Greek and Italian masters. These he brought safely to Padua, and there formed them into a permanent exhibition, which glorified the city and attracted to it great crowds of art-worshippers. So famous did this gallery become, and so powerful was its influence, that from all parts of Europe students came to join the school associated with it, and artists to study its glories. From Padua its influences were widely extended, and, concentrating in Venice, gave us artists whose works are still the most highly-prized possessions of the world's grandest cities, and, indeed, so far as public galleries containing them are concerned, have been claimed by the entire world as its most delightful and precious treasures.

From that time to our own, such art galleries have been regarded as valuable educational institutions, not only by virtue of their own grandeur as showing the greatest works of the greatest artists, but in consequence of their being generally connected with such art academies as in London are represented by the schools of our National Gallery, the Royal Academy's permanent exhibition, and those noble collections in the South Kensington art galleries. All these ennobling and developing art nurseries illustrate the old saying that "example is better than precept." They are as great promoters of zeal and earnestness now, when the attainment of those excellencies which stir our emotions and stimulate the higher faculties of the mind are concerned, as they were in the old days of their beginnings.

Our annual exhibitions of art works, although valuable also in their way, are, however, less elevated in their mission, less powerful in their influences, and altogether less dignified. Depending for their attractiveness upon the general public, the taste they display is too often that of their patrons rather than that of teachers and students. Supported by the shillings of visitors and commission on sales, their projectors are generally far too commercially minded to neglect all those little arts of vulgar puffery which were never more used, and they consequently regard success from the showman's point of view rather than the art-lover's or the art-teacher's, and they do so necessarily as the condition of their existence. If their projectors elect to hang the most absurdly fantastic productions, it is usually because their extravagance is sensational, and generative of much talking, writing, and controversial pugilistic encounters, all of which collect crowds and excite public curiosity. Therefore, careless of any mischief that may follow, and looking only to the chance of making money, the projectors of these exhibitions press into prominence works that imitate nature so abominably that they cannot but make the judicious grieve. They are experienced in all the craftiness and ingenuity of underground advertising, and, being themselves extensive advertisers, they have, of course, considerable influence with the press. Nor is this all; for in the worst cases dishonest favouritism, bought by some form of bribery, is not unknown, and not unfrequently the best works are rejected to make room for less worthy exhibits. Unconscious stupidity in self-elected judges, responsible only to themselves, will sometimes work mischief of a like kind, in a different way, so that some exhibitors will blush to see the company they keep on the walls of certain exhibitions, and others will decline to exhibit altogether, to avoid such companionship.

The worst result of ill-managed annual collections—not a few of them, being, we must remember, photographic—has been their disparagement in public estimation. Until quite recently, year after year, exhibitions of photographic societies were mere illustrations of mechanical, chemical, and optical processes. They had, with few exceptions, nothing more valuable to illustrate than the use of certain tools and materials. Sharpness and minute detail here, there, and everywhere, in foreground middle, and extreme distance, chronicled the triumphs of a lens. Combinations of exposure and development gave us results due to mere technical experience and mechanical dexterity. And all this time beautiful photographs full of pictorial sentiment and feeling, produced by artists of real merit, were being quite scornfully rejected, the mechanical being substituted for the intellectual, and set up above it.

Opie, in one of his lectures to the students of the Royal Academy, complained that even the hanging commitee of that Institution were influenced by the commercial rather than the artistic spirit in exhibiting in their annual collections works that would not have been otherwise selected. "So habituated," said he, "are the people of this country to the sight of portraiture only, that they can scarcely as yet consider painting in any other light; they will hardly admire a landscape that is not a view of some particular place, nor a history unless it is composed of likenesses of the persons represented, and are apt to be staggered, confounded, and wholly unprepared to follow such vigorous flights of imagination as would, as *will*, be felt and applauded with enthusiasm in a more advanced and liberal stage of criticism." In our exhibitions (which often display extraordinary powers wasted on worthless subjects) one's ear is pained, one's very soul is sick with hearing crowd after crowd sweeping round, and, instead of discussing the merits of the different works on view, all reiterating the same dull and tasteless questions, "Who is that?" and "Is it like?" So, when in one of this year's exhibitions an acquaintance of mine said of a photographic picture, in which air full of sunlight, and sky and cloud-formed pictures full of gradeur, with no end of charming pastoral associations, recalling such memories as poets have delight in recognising, could only say, "Yes, it's a fine work, very, indeed, *but* what place does it represent? It might be anywhere." A word, a name, even if it conveyed no idea to the mind, touched the heart with no sweet memory, would have been more to him; and this critic—alas! that one can say it—was a press art-critic. Some years ago I heard a scientific critic, who, in another and yet a kindred way, was criticising some photographs at one of the annual exhibitions. He said triumphantly to me, "There! where will you find the painting that can represent nature as that does? Look at the minute detail there is in it through my glass. Where is the human eye that could ever see nature so perfectly as the lens sees it?" He was a photographic journalist.

Now, what art-teaching should do is to show that both these critics, each very good and useful in their respective professions, was on the wrong scent; and this is just what our art galleries and art exhibitions ought to teach, and do teach, those who will be taught by them, whether they paint or photograph, write poems, plays and novels, act on the stage, speak from the pulpit, or wield the sculptor's chisel.

And now let us touch upon another phase of the subject. May we, seeing what encouragement the last two years have shown us at the Egyptian Hall, or may we not, dream of beginning, or think of beginning, or actually commence a permanent photographic exhibition in which the finest works selected from annual exhibitions and other sources should gradually accumulate and grow into educational importance?

On the 23rd of this month, in the year 1753, a letter signed Francis Milner Newton, to call a general meeting of artists at one of the oldest resorts of artists in London, "The Turk's Head," in Greek-street, Soho—this letter said: "There is a scheme set on foot for erecting a public academy for the improvement of arts of painting, sculpture, and architecture; and, as it is thought necessary to have a certain number of professors, with proper authority, in order to the making regulations, taking in subscriptions, erecting a building, instructing the students, and concerting all such measures as shall be afterwards thought necessary, your company is desired at five in the evening precisely, to proceed to the election of thirteen painters, three sculptors, one chaser, two engravers, and two architects, in all twenty-four, for the purposes aforesaid." A postscript was added requesting that from a list of names also forwarded these Academicians might be selected by the person appealed to. The attempt thus made for a while succeeded, but three years after, through internal faction, the society so formed split up into sections, from one of which came the Royal Academy as we know it, an educational institution with a permanent gallery of art works, with professional teachers of various kinds to serve as lecturers, a school for students, and the annual exhibition which in the May of every year is such a source of excitement in the circles of fashion and art.

Now, suppose it were practicable or possible, in this October of 1894, to begin, for the encouragement and advancement of artistic photography, to bring together, in brotherly unity, opticians, chemists, photographic engravers, portraitists, and picture-makers, of all the various kinds we know, and weld them all strongly and cohesively into such an institution as the painters have—royal or democratic, it matters not which—and suppose that it gave us professors of photographic optics instead of exclusively scientific optics, men specially fitted for their purpose, and in like way gave us artist-chemists, whose experiments should demonstrate art possibilities, not purely chemical ones; and suppose we had also, working hand in hand with practical professors, professors of pictorial art, to whom it could give such honours to the worthiest, in degrees, as the Academy gives in its A.R.A. and R.A.; and suppose that I now leave you to consider all these suggestions and suppositions, conjectures and suggestions, and thank you for the opportunity you have given me of putting them before you and the attention with which I have been honoured.

A. H. Wall.

MR. BIRT ACRES ON POLARISED LIGHT AS APPLIED TO PHOTOGRAPHY.

Before the members of the London and Provincial Photographic Association, on Thursday, October 18, Mr. Birt Acres gave a practical demonstration, illustrated with the optical lantern, of the value of the Nicol prism in photography. Commencing with a brief description of the manner in which light is propagated, he drew attention to the peculiar property of Iceland spar, which reduces the vibrations to two planes at right angles to each other, and, in consequence of one of these sets of vibrations being more retarded than the other, a double image is produced. He then, having parallelised the beam from the optical lantern, threw a small disc of light on the screen, and on placing a rhomb of Iceland spar in the path of this beam, two discs of light appeared, and, when the piece of spar was rotated on its axis, one of these discs revolved round the other. Having removed the rhomb of Iceland spar, he placed a piece of apparatus of his own design and construction for more clearly illustrating the reduction of the vibrations of light to two directions.

This apparatus (fig. 1) consisted of a bundle of fifty exceedingly thin sheets of crystal glass mounted in a frame with a mirror so arranged that the light reflected from the surface of the bundle of glass plates was again reflected so as to travel parallel to the beam of light which passed

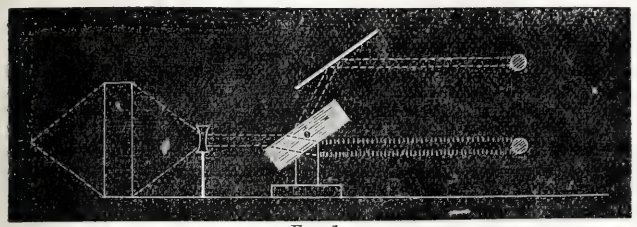


FIG. 1.

through the crystal glass. This piece of apparatus being placed in the path of the beam from the lantern, the glass being inclined at an angle of about 57°, two discs of light appeared one above the other on the screen, and, in order to show that the bundle of glass plates had produced precisely the same effect as the piece of Iceland spar, he placed a Nicol prism in the path of the light before it reached the bundle of glass. (A Nicol prism is made by cutting a piece of Iceland spar in a particular direction, and, after the surfaces are carefully polished, they are reunited with Canada balsam; by this means one of the two beams into which the light falling upon the spar has been divided is totally reflected aside, and is absorbed by the blackened mount of the prism, the other ray passing on.)

When the Nicol prism was rotated so that its longer axis was at right angles to the surface of the bundle of glass plates, then the light failed to penetrate through the bundle of glass, but the light reflected from the surface was not interfered with, the disc on the screen remained bright as before; but, when the Nicol prism was rotated through 90°, the converse to the foregoing took place, the light passed easily through the bundle of glass, but there was no light reflected to the mirror, consequently only one disc appeared; removing the apparatus with the bundle of glass and again placing the rhomb of spar in the path of the beam from the lantern (leaving the Nicol in position) only one disc of light appeared; on revolving the Nicol prism as in the last experiment, two discs alternately appeared and disappeared

After briefly explaining, by means of sketches on the blackboard, how the bundle of glass reduced the light to two vibrations, and having pointed out that with suitable apparatus it was possible to control the reflection from natural objects, metal work, paintings, &c., so that it was possible to photograph them in their true values, Mr. Acres next introduced another piece of apparatus of his own design (fig. 2), whereby

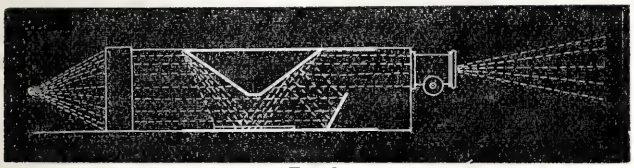


FIG. 2.

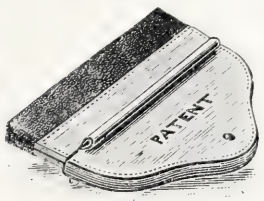
he was able to project the image of a small oil painting on to the screen; this apparatus was so arranged with mirrors that part of the light that fell on the painting was at the polarising angle and part of the light at ordinary angles; as soon as the limelight was turned on, all that appeared on the screen was a series of bright patches of light (reflections from the surfaces of the brush marks), but, as soon as a Nicol prism was introduced and rotated to a suitable angle, the reflections were entirely quenched, and the painting appeared on the screen in its natural colours. On rotating the Nicol as in previous experiments, the coloured image was obliterated by the brilliant reflections from the surface of the paint, and, on again rotating the prism, these reflections disappeared and the image of the painting appeared as before. This is, we believe, the first time that the subject has been practically placed before an audience, and the greatest interest was shown in the striking illustrations of the use of the Nicol prism.

In answer to various questions, Mr. Acres explained that the action of the Nicol when used in conjunction with a lens for photographic purposes was not that of polarising the light, but analysing it, a large quantity of the light reflected from natural objects being polarised. Iceland spar being extremely rare and costly, Mr. Acres explained that equally good results could be obtained with an optically worked black glass mirror. He also pointed out that halation was very much minimised when a Nicol or other analysing apparatus was used.

ANTWERP INTERNATIONAL EXHIBITION.—The official list of honours shows that the jury awarded 127 medals and diplomas in the department of photography. The names of only four English exhibitors appear in the list, viz., Messrs. Byrne & Co. and Messrs. York & Son (silver medals), Mr. J. H. Skinner (bronze medal), and Mr. E. Cecil Hertslet (diploma).

THE BIRMINGHAM PHOTOGRAPHIC COMPANY'S NOVELTIES.

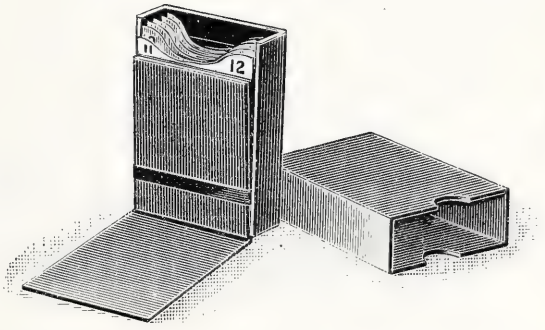
THE Birmingham Photographic Company of Criterion Works, Great Charles-street, Birmingham, are introducing several novelties in the way of photographic appliances which should form useful adjuncts in practical work.

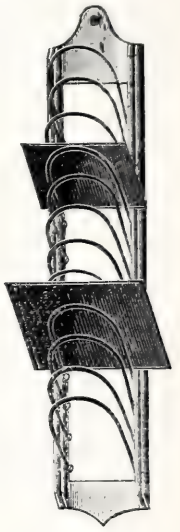


The negative dusting brush consists of a pad of soft velvet attached to a pliable leather holder; this for dusting plates before or after exposure is a handy little tool; photographers should not be without it.

The negative storage box consists of a neat cardboard box holding a number of paper divisions for placing the negatives between; the cover is provided with spaces on which numbers and particulars of the various negatives contained in the box can be written.

The negative draining rack may be affixed to the wall, and, as seen in the illustration, holds the negative in an easily accessible fashion. For drying plates, and generally as a negative-holder, this contrivance will be





found an admirable one. When not in use, the various supports may be pressed home flush with the frame. This is a particularly good idea.

The safe transit box has pads of soft material affixed to the cover and bottom, thus facilitating the safe packing of glass negatives or positives for transport.

Altogether these useful little impedimenta are of a kind to be much appreciated by photographers.

ADAMSON'S INCANDESCENT LIGHTING SYSTEM.

As originally introduced, the incandescent lighting system for photographic purposes devised by Mr. A. G. Adamson, of 136, Buchanan-street, Glasgow, consisted essentially of a large concave radiator of the usual pattern, so hung as to be easily adjustable in every necessary direction for studio portraiture. The source of the electric illumination, instead of being an arc lamp such as is resorted to in most systems of a similar kind, was derived from a number of incandescent lamps. Two of these were placed in the centre of the radiator, and gave sufficient light for focussing by. Around the circumference of the radiator were placed other incandescent lamps, space being provided for forty-eight. Current being available from the main, the light was turned on in the usual way, and was quantitatively under control. The maximum power obtainable with twenty-four lamps was between 4000 and 5000 candle power, which, with a rapid plate and Ross's cabinet lens, allowed of as short an exposure as one second.

Upon this form, as above briefly described, Mr. Adamson has made several alterations and improvements, which should conduce both to the simplicity and efficiency of the system.

The reflector is now composed of a light steel frame covered with silk, so that the studio is flooded with soft light, it being claimed that this does not produce the effect of glare common to lights from solid reflectors. The weight of the complete apparatus hung in its place does not exceed eighty pounds. It has a universal action, and can be placed anywhere in the studio with the slightest touch, and, being accurately counterbalanced, it will remain wherever placed.

The lamps are controlled by a patent combined switch and resistance, and all or part of them may be used as required. They give a soft, pure, and brilliant white light. It is also claimed that the system cannot readily get out of order and is economical in the highest degree, about

one-eighth of a penny covering the cost of each exposure. The quality of the light is said to be invariable. Certain other minor improvements have also been imparted to the system.

There is no doubt that for portrait use this method of electric lighting is practically efficient and pleasant to employ. The light emitted is soft and bright; noiselessness is assured; the actual quantity of electricity consumed on an exposure or a series of exposures is exceedingly small; and we can vouch for the fact that the negatives so produced compare in quality and effect with the best of those obtained by natural light. Without going into the question of the rival merits of the arc light *versus* the incandescent light for studio work, on which point future controversy is not unlikely to arise, we may give it as our opinion that Adamson's incandescent electric lighting system fulfils all that is claimed for it.

Our Editorial Table.

Darstellung der Natürlichen Farben.

By H. Krone. Weimar: Verlag der Deutschen Photographen-Zeitung.

This *brochure* gives a *résumé* of the experimental work in colour photography, particulars of which have been published during the last fifty years. The work of Becquerel, Albert, Carey Lea, Ducos du Hauron, Eder, Ives, Hubl, Lippmann, Lumière, Valenta, and others, is summarised.

The Blue Book of Amateur Photographers.

Edited by Walter Sprange.

This British edition of the Blue Book is a compendious volume. It contains a list of all the Photographic Societies in the United Kingdom, with the names of their officers, and, in numerous instances, of their members, with their addresses. A list of dark rooms, information anent photographing in public parks and other places, together with a list of Societies in America, the European Continent, and the Colonies, all combine to render this a useful book of reference. In addition to this there are twenty more or less attractive photographs bound up with the book. Published by Straker & Sons, 38, King William-street, E.C. Price 2*s.* 6*d.*

The Britannia.

By the Rothsay Collotype Company.

Messrs. Adamson, of Rothsay, Scotland, having established a Collotype Printing Department on a most complete and extensive scale, have sent us specimens of their work which possess great excellence. Among these is a view of H.R.H. the Prince of Wales' yacht *Britannia*, both in the original size in which it was taken and in an enlarged form. This latter is a print of singular excellence, possessing fine gradation and brilliance without heaviness. When we consider the speed at which the vessel was going when photographed, the sharpness of the enlargement is almost phenomenal. Mr. Adamson has captured the yacht in a most pleasing position.

We have received from Mr. Wm. Laurence, Sackville-street, Dublin, a pleasing remembrance of a visit to the Seven Churches, Wicklow, during the late Convention. While the excursionists made their short stay at Glendalough the weather was unpropitious for camera work, but Mr. Laurence has obviated the necessity for great lamentation on this account, as the print (in platinum) received has been taken by him under circumstances of the most genial weather and selected lighting.

News and Notes.

Photographic Exhibition.—Lantern arrangements for the week:—Monday, October 29, slides by Messrs. West & Son (Southsea). Wednesday, October 31, slides by J. B. Hilditch, Esq. Saturday, November 3, slides by Henry Sandland, Esq., J.P.

The Newport Sketching and Photographic Society will hold their Annual Exhibition on November 13 and 14 next, which will be opened by the Right Hon. Lord Tredegar. The Exhibition will consist of paintings, photographs, and other works of art.

Messrs. Macmillan have in preparation a *Popular History of Celestial Photography*, by Mr. R. A. Gregory and Mr. Albert Taylor. The book will be divided into twelve sections, says *Nature*, each of which will trace the development of the application of photography to a particular branch of astronomical inquiry.

Hackney Photographic Society.—The Hon. Secretary (Mr. W. F. Fenton-Jones) writes: "Our Exhibition is to be opened on Tuesday, November 20, by Sir Henry Trueman Wood. We always have a bright Exhibition, and proceedings are enlivened by organ recitals, orchestra, and concerts, together with lantern exhibition of slides. Of twenty firms exhibiting, the following are well known:—Messrs. Edwards (B. J.) Watson, R. & J. Beck, Shew & Co., Park, Hannam, &c. Will you please intimate to your readers that the last day to receive forms is October 30?"

The Polytechnic Photographic School.—The programme of the photographic School of the Polytechnic Institution for the coming winter has just been issued. The introductory lecture takes place on Friday, November 2, and during the session there will be classes and lectures on Art, Pure Photography, and Photo-mechanical Work by Messrs. Horsley Hinton, Valentine Blanchard, A. W. Dollond, A. A. K. Tallent, Howard Farmer, S. J. Beckett, C. R. Whiting, J. H. Gear, C. W. Gamble, H. Calmels, and others. Full particulars may be obtained of the Secretary, 309, Regent-street, W.

The next number of the *Artist, Photographer, and Decorator* will, in addition to illustrated articles upon the two Photographic Exhibitions, contain several important reproductions of Sir E. Burne-Jones's work, and a full-page reproduction of a valuable drawing by Mr. Ruskin, drawn between the years 1843 and 1845, when Mr. Ruskin was occupied upon his *Modern Painters*, which is now published for the first time. In an early issue will also commence a series of invaluable reproductions from a sketch-book by Michael Angelo, which has been placed at the disposal of the proprietors by a private collector. These sketches have, up to the present, never been reproduced.

Kodak Recreation Society.—This Society, the members of which are entirely drawn from the *employés* of the Eastman Photographic Materials Company's factory at Wealdstone, held their first smoking concert at the Assembly Rooms, adjoining the King's Head Hotel, Harrow, on Friday evening last. The hall was well filled, about two hundred being present. A long and interesting programme was gone through, which reflected great credit upon both performers and Committee. The programme consisted of comic and sentimental songs, trios, pianoforte solos, and a stump speech, and wound up at about half-past eleven with the usual vote of thanks and the National Anthem. Mr. Harold Senier occupied the chair, and was supported by Mr. George Dickman (the Managing Director of the Company), Mr. A. W. Rider (the Secretary), the Committee of the Kodak Recreation Society, and others.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
29	Camera Club	*Platinotype Toning.* F. FitzPayne.
29	Central Photographic Club	*The Preparation of Negatives for Printing.* Edward Dunmore.
29	Devonport	*Enlarging.* C. H. Moore.
29	North Middlesex	Informal Discussion.
29	Richmond	*Some of the Principles of Emulsion-making.* A. Mackie.
30	Birmingham Photo. Society	
30	Brixton and Clapham	Informal Meeting.
30	Hackney	*Popular Authors and their Work.*
30	Halifax Camera Club	
30	Lancaster	
30	Leith	
30	Paisley	
30	Warrington	
30	West London	
31	Bath	
31	Burnley	
31	Leytonstone	Members' Lantern Evening.
31	Photographic Club	Lantern Night.
31	Photographic Salon	*Early Forms of Pigment (or Carbon) Printing Revived* Alfred Maskell.
31	Southport	
November 1	Birmingham Photo. Society	
1	Camera Club	*Printing Processes on Metal.* L. E. Clift.
1	Dundee and East of Scotland	
1	Glasgow Photo. Association	
1	Glossop Dale	
1	Hull	
1	London and Provincial	*System.* Walter D. Welford.
1	Oldham	
1	Tunbridge Wells	
2	Brighton and Sussex	
2	Cardiff	
2	Central Photographic Club	*Precious Stones.* T. C. Hepworth.
2	Croydon Microscopical	
2	Holborn	
2	Leamington	
2	Maidstone	
2	North Kent	
3	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

October 23,—Technical Meeting,—Mr. Andrew Pringle (Vice-President) in the chair.

Mr. E. Clifton showed and described the exhibits of the London Stereoscopic Company now in the Exhibition, these consisting of the Black Band enlarging apparatus for enlarging from a definite size to a definite size, the

binocular hand cameras, the quarter-plate Carlton, and the twin-lens Carlton. Referring to the lenses fitted in the last-named camera, Mr. Clifton said it had been found that it was not sufficient to "pair" them in the ordinary way, but that they must be specially and identically ground for the purpose.

New Platinum Toning Bath.

Mr. A. Cowan showed a number of prints on the new "Mariona" matt printing-out paper, toned with platinum. He found that, by the use of chrome alum, he could omit both the washing before toning and the acid from the toning bath. The formula was as follows:—

Chrome alum (one per cent. solution)	10 ounces.
Sodium chloride	10 grains.
Potassium chloro-platinite	1 grain.
Water	10 ounces.

With this bath he obtained almost any colour. Mr. Cowan also showed a number of other prints, some of which had been immersed in the chrome alum solution before toning; no difference was apparent between the results obtained when the chrome alum was mixed with the toning solution. He had found the toning formula above given applicable to developed prints and also to all matt papers; with the glossy papers he had never succeeded in getting satisfactory tones with platinum.

Orthochromatic Photography.

Mr. L. Warnerke described a number of experiments made with Lumière's plates; plate A (yellow sensitive), B (yellow and red), C (yellow, red, and green), and ordinary plates. For these experiments he said that he preferred a monochromatic light, using a clockwork magnesium lamp and coloured solutions for light filters. The coloured object selected for reproduction was the colour chart issued with Cassell's *Technical Educator*. He preferred this to a pure spectrum because of its having mixed colours. In 1884, when he last experimented with orthochromatic plates, he had not found much improvement on them over ordinary plates, but in his recent experiments he had found the coloured emulsions had an enormous influence. By the aid of curves, negatives, lantern slides, and prints Mr. Warnerke illustrated the colour sensitiveness of the Lumière plates.

On the suggestion of the Chairman, it was decided to adjourn the discussion on Mr. Warnerke's paper.

Mr. Penrose showed negatives made for three-colour printing by the aid of Carbutt's light filters, also the resulting prints. Incidentally he remarked that, for the red, an ordinary plate was resensitised with cyanine. The relative exposures required with the three filters was five, fifteen, and forty-five minutes.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

October 18,—Mr. A. Haddon in the chair.

Mr. E. G. Harvey was elected a member.

Mr. P. Everitt (Hon. Secretary) described an experiment he had made with the view of ascertaining the effect of light and damp on a zenotype-toned print. The print had been placed in a glass vessel over water for a fortnight, and, from the appearance of the print at the end of that time, Mr. Everitt concluded that the process was a fairly permanent one.

Mr. W. E. Debenham said it would be interesting to have the experiment repeated with sulphur-toned prints.

The Chairman stated that he and Mr. Grundy had recently subjected prints toned in a variety of ways to the action of water in a bottle that had been exposed to light for two months, and, although the gelatine was beginning to drop off the paper, there was actually no change in the colour of the print. Some of the prints had been purposely toned with sulphuretted hydrogen. The Chairman said the subject would be referred to later.

Polarisation applied to Photography.

Mr. Birt Acres, F.R.Met.S., gave an address on this subject [see page 682].

At its conclusion a short discussion followed, in which Messrs. Mackie, A. J. Brown, W. E. Debenham (the latter gentleman suggesting the placing of a black mirror between the lenses), and the Chairman took part. A vote of thanks to Mr. Acres concluded the proceedings.

PHOTOGRAPHIC CLUB.

October 17,—Mr. J. Nesbit in the chair.

The camera "Photosphere" was shown. The silver prints from negatives taken in this instrument were pronounced excellent.

Mr. Bridge exhibited a print from part of a 12×15 negative, which showed insensitive marks. He had gone very thoroughly into the why and the wherefore, but it was beyond him to decide why they should be there. He proved conclusively that the insensitive spots exactly coincided with the ends of two panels of one shutter. The plates had been in slides four or five days. Although the slides had been in use over two years, they showed no signs of damage in any way. He had no doubt a fresh coating of black inside would stop the trouble.

Mr. S. H. Fry opened a discussion, in which the Chairman, Messrs. Bridge, Cowan, Foxlee, and others took part. The subject was, *For and against Separate and Combined Baths for Toning and Fixing Printing-out Papers.* Mr. Fry, in his opening remarks, said that it was just as easy to make bad prints on print-out paper as with any other. He strongly condemned the use of sulphocyanide, on account of its being such an unstable salt. Even more strongly did he urge the necessity of washing out the free silver and acid prior to toning. So far as colour of resulting print was concerned, it depended upon the percentage of gold in solution. He pointed out that a happy compromise should be made between what ought to be and what is. What ought to be is not often possible, nor is it always practical. He believed in simplicity of chemical operations, and summed up his remarks by saying that the separate baths did not cause such a loss of tone, whilst, in favour of the combined, the process after printing was quicker. This was his formula for working:—

Hyposulphite of soda	1 pound.
Water	80 ounces.
Acetate of lead	1 ounce.
Gold	8 grains.

Dissolve hypo in sixty ounces of water, and the lead in remaining twenty ounces; then add the solution of lead to the solution of hypo. Each ten ounces will contain one grain of gold—sufficient to tone one sheet of paper. He never used solution more than once.

The Chairman asked Mr. Fry which process he preferred.

Mr. Fry preferred combined baths.

Mr. Bridge asked Mr. Fry if he had been able to tone large prints—say 12×15—with freedom from double toning.

Mr. Fry said yes, so long as he recognised the fact that the paper had to be free from acid.

Answering a question, Mr. Fry said, when wishing to obtain a "glazed surface," he used alum last before squeegeeing.

Mr. Foxlee thought the acid could not be removed from gelatino-chloride paper by simple washing alone. He referred to the old combined bath, with which and albumen paper one could get any tone. He would like to know what part lead played in the formula quoted by Mr. Fry.

Old bath referred to by Mr. Foxlee.

Hypo	12 ounces.
Water	16 ,,
Gold	(in two ounces) 15 grains.

And add to hypo; could be used over and over again. This was the old formula.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held at 36, George-street, on Thursday, October 11, Mr. J. Wood in the chair.

The report of the retiring Council was read, and the Treasurer's statement was presented. The latter showed that the financial condition of the Society was in a sound and satisfactory condition.

Mr. Heywood, referring to a matter which had only come to the knowledge of most of the members that evening, which was that the Hon. Secretary, Mr. W. H. Farrow, who had filled the position for the past four years, was not seeking re-election, said he had been requested to ask Mr. Farrow to accept, as a token of their esteem, a small amount which had been quite spontaneously, and without any formality, subscribed, and which, though "paltry" in itself, he hoped would be accepted as a tangible expression of their esteem and regard.

Mr. Farrow, in thanking the members for the high opinion they had formed of his services, said it would be extremely ungracious on his part to refuse a gift offered in such a kindly manner, which he would accept and convert into a form which would always remind him of the spirit which prompted its presentation.

The election of the new Council was then proceeded with, and resulted in the following selection:—*President:* Mr. H. M. Whitefield.—*Vice-Presidents:* Messrs. A. Brothers, T. Chilton, T. R. Cobley, A. Heywood, and J. Word.—*Council:* Messrs. F. W. Andrew, F. W. Burt, C. H. Coote, F. Edwards, W. H. Farrow, H. V. Lawes, W. Tomlinson, O. H. Webb, J. Whittaker, and J. C. Wolfenden.—*Hon. Treasurer:* Mr. W. G. Coote.—*Hon. Secretary:* Mr. A. E. Casson.

Annual Report, 1894.

In reviewing the past twelve months' work of the Society, the Council have to report a quiet and steady interest maintained amongst the members in the matters brought forward at the meetings, but have to regret that the tendency still remains to leave the work of preparation or of providing subjects in the hands of the few, who, no doubt, whilst feeling amply repaid for their labour by the attention accorded to them at the meetings, would prefer that they might a little oftener be allowed to take their turn as auditors.

It being assumed that the formal character of the meetings might have something to do with the prevailing bashfulness, a slight modification in the evening's procedure has been tried during the year, by allowing a short interval between tea and the commencement of the business. This seems to have been very well and pleasantly occupied, and has in a manner shown that modesty is really at the bottom of the non-production of prints, &c., in a formal manner, for there has been noticed quite a number under examination until the Chairman's bell has put the closure on interesting, and often very animated conversations.

A proposal was discussed early in the year to dispense with the formal reading of the minutes, &c., but for various reasons this was not considered desirable, so that the only way the frigid formality of the meetings can be abolished is by each and every one present warming well up to the subjects under discussion.

The Society, having in view the danger likely to arise in the use of unsuitable cylinders for compressed gas, and of which a large number were believed to be in circulation, directed that a communication should be addressed to Sir H. E. Roscoe, M.P., requesting him to bring the matter before the notice of the proper Government authorities. To this a reply had been received, in which Sir H. E. Roscoe had promised to give the matter his attention.

The ordinary meetings have been occupied by discussions and descriptions of the present methods of photographic work, and generally more from a practical point of view than from the scientific or experimental aspect; but in the latter sense must certainly be taken a paper contributed by Mr. J. Kidson Taylor on the *Platinum Toning of Chloride Prints*, and for which the Council record their best thanks. The thanks of the Society should also be recorded to Mr. W. I. Chadwick for the instructive and entertaining manner in which he occupied the January meeting night with *Photo-micrographic and Lantern Matters.*

The Exhibition of members' work, held on lines similar to the one of the

preceding year, but in April instead of March, displayed good results, but the number of competitors in the several classes was not as great as on the former occasion, otherwise the show was very successful. Mr. W. Artingstall, Mr. J. W. Wade, and Mr. George Wheeler were the Judges, and are entitled to the thanks of the Society for their kindness in acting in that capacity.

The outdoor meetings cannot be recorded this year as satisfactory, for, with the exception of two, they have been either very poorly attended or abandoned entirely. This form of meeting, unless those taking part therein make very definite personal arrangements, seems to have lost the attraction or advantage it once had to the average photographer, when special places were not so easily got at as they are now.

The lantern section meetings have maintained their usual attractiveness both for members and friends, and, with one exception, were all in the form of popular displays. The exception was the November meeting, when Mr. S. Herbert Fry demonstrated the working of Paget lantern plates. A pleasant feature of the past lantern season was the exchange of an exhibition with the Manchester Amateur Society.

The Society again contributed a collective set to the annual Exhibition of the Photographic Society of Great Britain.

The Library has been kept well up to date in photographic literature, from which the members might make fuller use of their privileges by borrowing oftener than during the past.

The thanks of the Society are due to the publishers of the various photographic periodicals for gratis copies sent during the year, and also to the firms who have contributed exhibits of apparatus and specimens, which have added to the interest of the meetings.

The membership remains nearly stationary during the year; six new members were elected, and nine have resigned. The Council have held twelve meetings, with an average attendance of eleven.

A synopsis of the various meetings which have been held during the year, it is hoped, will show that the members of the Council who now resign their various offices have endeavoured to carry out the aim and object of the Society, which is well summed up in the second rule, and they trust that the full energy of all will continue to be devoted to the "promotion of the science and art of photography by means of research, social intercourse, and rational recreation in connection therewith."

Central Photographic Club.—First Annual Report for the year ending September 30, 1894.—The Central Photographic Club was formed at a meeting held on September 13, 1893, when it was decided to take the rooms offered by Mr. — Coleman, Coleman's Hotel, on terms submitted by him to the Provisional Committee. The long and serious illness of Mr. Coleman caused the completion of the agreement, the decoration and improved furnishing of the rooms, and other matters, to be postponed from ime to time, and his death prevented the completion. The Committee found it quite impossible to complete the agreement with the owners of the hotel. The Secretaries called several Committee meetings, at which there was no quorum, and therefore simultaneously submitted their resignations to a special general meeting on May 18, 1894. At this meeting (of which the minutes will be read) the resignations of Messrs. A. Cowan, F. Hindley, F. P. Cembrano, and F. M. Sutcliffe, Committeemen, were accepted, and Messrs. W. Allport, J. H. Avery, G. H. James, and G. Wilkes were elected in their places. Mr. W. Fenton-Jones having resigned the co-Secretaryship, Mr. Charles W. Gamble was elected to fill the vacancy. The present Committee desire to say that they are not, and never have been, satisfied with the accommodation which we receive from the proprietors of the hotel, and they think that a great deal of the non-success of the Club is due to the comfortless and inefficient arrangements which are made. The Committee at the outset made an agreement with the then proprietor of the hotel (Mr. Coleman), and, had the provisions of that agreement been carried out, there is every reason to believe that a better state of things would have prevailed. Many things were promised which we have been utterly unable to obtain. The badly furnished rooms, the dirty state in which they are kept, and the inefficient service are matters which the Committee have endeavoured to alter. The manager (Mr. Henry) appears to have been practically powerless to make any alteration. During the last two months active negotiations have been passing between the Committee and the agents for the proprietors of the hotel with the object of securing a better state of things. We have proposed the complete removal of the wall which separates our two rooms, and that the whole should be cleaned and redecorated, and that certain repairs should be made to the dark room, and an alteration should be made in the tariff for the benefit of the members of the Club. We have insisted that some arrangement should be made in the large room in which we now assemble for our weekly meetings for hanging pictures, and they suggested that it should be redecorated. The proprietors' agents require that, before they make these alterations, we shall give them an agreement to take the room for three years. This the Committee have absolutely declined to assent to, and, furthermore, have thought it inadvisable to continue under the present conditions. A deadlock has therefore taken place, and, in consequence, the Committee felt it their duty to give the proprietors notice last Thursday week evening, September 28, it being the day before quarter day, as they do not feel inclined to run the risk of six months' rent, when we might possibly have to leave the premises. The courses now open to us are that either we must look for fresh rooms, which the Committee are quite prepared to do, or, if the members are not prepared to agree to this, there is no other course than to wind up the Club. The Committee have no other course open to them but to leave the matter in the hands of the members. The present Committee think that, for the rent we pay, suitable rooms should be obtained. It is for the members this evening to appoint and instruct a new Committee as to their wishes. Several resignations have taken place, thirty in all. We have also to announce the accession of nine new members. These have been obtained by the canvass of one or two members, and it is interesting as showing what could be done if the members really took the matter earnestly in hand. It is not fair to neglect the Club and then blame the Executive for the falling-off. The total number of members who have paid during the past year amounts to 202, and thirty-one meetings have been held. The new Hon. Secretaries (Messrs. J. H. Avery and C. W. Gamble) write: "The new Committee of the Central Photographic Club regrets that its first act should be to send to members a report so unsatisfactory as the enclosed. At the annual general meeting, held on Friday, October 5, a very strong feeling in favour of the continuance of the Club was expressed, and the Committee was instructed by the meeting to write to every member with a view to ascertaining the measure of his support. We feel, as our predecessors felt, that it is useless to hope for the completion of our desired agreement with the owners of our present rooms. We therefore propose to seek more suitable premises if the general members join with those who attended the annual meeting in supporting us in this effort. Please say, per return, whether you are prepared to leave to our discretion entirely the arrangements for the present Club year (subject to the calling of a special general meeting to accept or reject our proposal *re* new rooms). As it may be an advantage in taking rooms to have a furnishing fund of our own, the general meeting instructed us to form a guarantee fund for the purpose. 41*l.* 11*s.* was subscribed in the room. This sum has since been raised to over 50*l.*, and we hope to increase it to at least 100*l.* May we add your name as a guarantor to the fund; and, if so, to what amount? We are convinced, however, that a really good Central Photographic Club is needed more than ever. We have the names of many influential men willing to join us at once if we obtain suitable and comfortable quarters. The success of the Club demands hard and earnest work (which we are prepared to give), but with the solid support of the members we are confident of a very prosperous future. May we count on your support?"

Croydon Microscopical and Natural History Club (Photographic Section).—A demonstration was given, on Friday evening last, to the members of the above section, by Mr. ABBOTT, on the *Zenotype Process*, in conjunction with Mr. Brown, the inventor of the process, Mr. J. H. Baldock, F.C.S., in the chair. Zenotype was described as a simple, economical, and beautiful process, producing results even more permanent than those obtained with gold, while its cost was almost nominal, a sixpenny tube of the zenotype powder sufficing to tone about one hundred cabinet-size prints. These tubes are sent out graduated, and a quarter of a tube of powder makes ten ounces of solution all ready to work with. But, besides being a toning, it is also a developing process, so that the prints need be printed to only a quarter or half the depth required in the ultimate result. The power given by this process to produce so many colours is indeed partly due to this fact. Many of the gelatino-chloride papers and printing-out lantern plates are suitable for this process, but perhaps the best results can be obtained with Otto and Citos papers and Paget lantern plates, though the contrast between the colours obtained and the pink colour of Citos paper might, by some, be thought to be inharmonious. To set against this, however, the action with Citos is quicker, so that printing need not be carried so far, and also that the red carbon colour is most readily obtained with this paper. Varying colours are obtainable in several ways; for instance: (1) by printing to various depths; (2) by adding certain chemicals to the solution; (3) by employing different papers; (4) by the addition of alum to the fixing bath, &c.; but the two first are specially recommended, particularly to beginners. Thus it is possible, by the exercise of care and discretion, to obtain two, three, or even more colours in the same print. In making the solution it is advisable to use only pure distilled water if possible, and to keep the prints moving in the solution, so as to avoid unevenness of action and staining. Stains at the back of the print are of no consequence. In developing, the shadows may be disregarded—indeed, may be allowed to become almost black—and when all detail is fully out the prints are to be transferred to hypo, three ounces to the pint, without previous washing. In this they at first fade, but soon regain their vigour, and in ten minutes are ready for washing, which must be continued for about an hour. By the previous addition of a solution of potassium or ammonium bichromate, in the proportion of three minims of a solution of four grains to the ounce of either salt to ten ounces of zenotype solution, a modification of the colour can be obtained, but it is very necessary to avoid adding too much, or the action is so rapid as to pass beyond control. With this addition, too, the printing need only be slight, which is an obvious advantage in dull weather. In proof of the permanency of the colour obtained by the process, a letter was read from a firm in Liverpool stating that prints had been exposed for nearly six months to the full action of light in the window without showing the slightest change. The CHAIRMAN stated that he had been trying the zenotype process for some time, and showed a book of prints illustrating some of the colours, which were much admired. These included carbon red, purple, brown-green, and a very beautiful "zenotype brown." He stated that, so far as he had tried the process, he was charmed with the beautiful effects obtainable with it no less than with the ease and simplicity of working it. He also mentioned that, having heard a report that the process had been condemned because it was an acid solution, he might state that one of the first things he did on making the solution, long before he heard the report, was to test it, with the result that he found it perfectly neutral. The Chairman and some of the members then developed some prints themselves very satisfactorily; and, after a cordial vote of thanks, proposed by the Chairman, seconded by Mr. C. H. B. Sparrow, and carried unanimously, a very pleasant and instructive evening was brought to a close, and the crowded meeting separated.

Hackney Photographic Society.—October 16, Mr. J. O. Grant presiding. —The HON. SECRETARY announced that the meeting on November 6 next, fixed as an Open Night, would be used for testing members' lantern slides. Members' work was shown by Messrs. Dean and Hudson. A question from the box asked for the best method of printing clouds in platinotype prints. In reply, Mr. Hensler had cut a mask to fit the ground portion of picture, and then had given the sky one-tenth the exposure under a suitable cloud negative. The CHAIRMAN said that masking, when the outline was at all rugged, was a somewhat difficult matter and required care. Mr. PUTTOCK asked for a good formula for toning Otto paper. Mr. HENSLER said he had used the Ilford sulphocyanide formula with good results. Mr. GOSLING then read a paper on *Cheap Photography and How to Work It*, in the course of which he advised

workers to get the best of everything if they could afford it, but, if economy was to be studied, not to be disheartened, for some good serviceable apparatus could be made with a very little pecuniary expenditure. Furthermore, the fact of only having to make his own apparatus would teach him more than if he bought his outfit ready-made. The speaker then described how he made at different periods four or five cameras, good serviceable instruments, at a minimum of cost. Continuing, he said that a man who studied economy should keep to one make of plates, so that he might become thoroughly acquainted with its peculiarities. As a good developer, he recommended the Ilford quinol formula. It could be used for both plates and papers, and the solutions could be used repeatedly. Amidol also was a very cheap developer. Many plates were wasted by means of a faulty dark-room light. Mr. Gosling had recently tested this by means of the following experiment, the result of which was shown at the meeting. An Ilford isochromatic plate was exposed in sections for one minute at sixteen inches' distance from an ordinary paraffin lamp. The sections were shielded as follows:—No. 1, one sheet ruby glass; No. 2, one sheet ruby glass and one thickness ordinary medium; No. 3, Two sheets ruby glass; No. 4, one sheet ruby and on sheet ground glass; No. 5, one sheet ruby, one sheet ground, one thickness orange paper. In the results, No. 1 was badly fogged; No. 4 came next with about half the amount of fog; then came No. 2, followed by No. 5, which was only fogged slightly; No. 3 was quite clear.

Ealing Photographic Society.—The Annual Meeting of this Society was held on Thursday, October 18, in the Society's rooms at the Public Buildings, Ealing, Mr. H. W. Peal in the chair. The report of the Council and the balance-sheet for the past year were read. The PRESIDENT commented on the healthy state of the Society, and proposed that the balance-sheet, &c., be passed. Dr. C. GIBBONS, in seconding the motion, said that he was very pleased to see that the Society was progressing so favourably. The proposition was carried unanimously, and a vote of thanks to the Auditors was passed, the number of attendances of the Council members was read by the Hon. Secretary, and the voting for members of the Council for the ensuing year proceeded with. Mr. A. Ernest Smith was elected in place of Mr. A. Belt (retired). The remainder of the Council and all officers were re-elected. Two new members proposed. The PRESIDENT then explained the very generous offer by himself and his brother (Mr. C. N. Peal) of the loan of two powerful arc lamps to the Society. M. CHARLES WHITING, in speaking of the success of the Society, said that its increase had been gradual, but certain. Referring to the last Exhibition, he said that, although that was a very good one, he hoped and expected that the one to be held next month would be far better. He trusted that members would all send in their best work, so that it might compare favourably with the work shown in the open class. He pointed out that members of this Society had more advantages than the members of any other Society either in or near London, and on this fact becoming more generally known the number of members would, no doubt, rapidly increase. He thought that both the enlarging lantern and the Exhibition would attract many new members; the fact of the Society having such an excellently lighted lantern would render it possible for members to do far better work than they would otherwise be able to accomplish. He thought that the Society should be a mutual aid Society, and that the members should help one another; those who wanted to know anything should ask, and not let bashfulness (that bane of photographers) prevent them from finding out things which other members would gladly tell them. He also recommended that each member should take up some subject systematically. A vote of thanks to the officers was proposed by Mr. Phillips and carried unanimously. The PRESIDENT having replied, Dr. C. GIBBONS referred to the supposed exclusiveness of the Society, and strongly combated the erroneous idea which had, by some unknown means, got about that the Society was exclusive in its character. Messrs. Phillps, C. Whiting, Yewns, H. W. Peal, and others, spoke on the same subject, and the meeting closed with the usual vote of thanks to the Chairman. Samples of Messrs. Elliott & Sons' Rocket-Barnet plates and Mr. Otto Scholzig's printing-out paper were distributed, a new formula for developing the latter being read by the Hon. Secretary.

Putney Photographic Society.—At the meeting on the 18th inst., Mr. H. Faulkner in the chair, a demonstration of the zenotype process of developing and toning gelatino-chloride papers was given by the inventor, Mr. Brown, assisted by Mr. Abbott. Prints on Otto, Citos, and Solio papers, some showing only a very slight image, others about the depth of a finished print, were, without washing, placed in a solution made from the zenotype powder and water. Toning and development duly proceeded, and the prints were placed direct in the hypo bath, a wide range of colour being obtained, either by varying the depth of the print or a slight addition to the toning bath. Amongst the colours obtained were light red, warm red, brown, sepia, and green, some of the colours being much admired by the members present. On the question of the permanence of the prints toned by this process, a letter was read from a firm who had exposed prints during the whole of last summer to the sun in their windows, and who reported that they were as good now as when put in. It was announced that the Zenotype Company hoped shortly to put on the market a developer which will develop gelatino-chloride prints which have been merely exposed to gaslight. A vote of thanks to the demonstrators concluded the proceedings. Next meeting, November 5, subject, *About Lantern Slides*, by Mr. John A. Hodges.

FORTHCOMING EXHIBITIONS.

1894.

October 26–Nov. 3 ... *Photographic Salon. Alfred Maskell, Hon. Secretary.
,, 26–Nov. 14 . *Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,, 26, 27 ..... Southport Social. J. R. Cave, 52, Nevill-street, Southport.
November 12–17 ..... Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
November 20–22 ..... *Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,, 21, 22 ... *Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,, 22, 23 ... Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,, 23–Dec. 1 *Stanley Show (Photographic Section).
,, 27–Dec. 1 *South London Photographic Society. C. H. Oakden 51, Melbourne-grove, East Dulwich, S.E.
,, 29–Dec. 1 *Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytoustone.

1895.

March 25–30 ..... Brixton and Clapham Camera Club.

Those marked * have Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,631.—"An Improved Rack for Photographic Negatives." J. B. BROOKS.—*Dated October*, 1894.

No. 19,665.—"Improvements in Changing Box for Photographic Cameras." H. G. M. CONYBEARE.—*Dated October*, 1894.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PAPER NEGATIVES.

To the EDITOR.

SIR,—I have waited till to-day in order to see if your leader pleading for the reintroduction of paper for negatives would elicit any sympathetic response. I see in this week's JOURNAL that "R. T." fully appreciates the advantages of paper, but chiefly in the form of the spool for the roll-holder. It tractability, both in use and development, is so superior to that of celluloid that no proof is required; but, using paper in place of the usual celluloid films, I have obtained negatives which give results equal to any on celluloid (in fact, the prints were supposed to be from old collodion negatives), and I have even made lantern slides from them which passed without detection in a critical audience.

This paper is, I am sorry to say, a thing of the past, and, when I inquired about it some years ago at the Eastman Company's offices, I was told that only three or four workers besides myself ever asked for it. The Eastman paper varied a little in its texture, but with some batches it was perfectly unnecessary to do anything in the way of rendering it transparent. It required very little more time in printing than a glass negative.

I send you a few negatives which I have taken lately when unable to leave the house; the better ones have been carried off by friends who had never seen paper negatives, and who were all anxious to know where the paper could be procured. I could only reply, "Nowhere."

These were taken in a hand camera, putting the paper in the usual film-carrier.

The date of the paper is March, 1886.—I am, yours, &c.,

October 20, 1894. E. HEALY.

THE SALON.

To the EDITOR.

SIR,—May I bring to your notice what I consider the very loose and careless way in which contributions of photographs to the Salon are apparently being treated. I submitted two pictures to the consideration of the committee, and, after waiting nearly a fortnight after the Salon opened without having any communication whatever about them, I wrote the Secretary for information, and then was informed that they were rejected, and a lame excuse was tendered as a reason for the delay in communicating with me.

Now, I have received my photographs back, and what left me as carefully packed new gold frames came back to me bearing every sign of having been handled with the most utter carelessness, and the frames are quite ruined, and the only thing I can do with them is to put them into the gilder's hands, and bear the expense of having them regilded.

Now, in face of such a want of common care and courtesy, I need hardly say I shall very carefully indeed consider the matter before running a like risk in future.—I am, yours, &c., JOS. G. WOOD.

Highfield, Selbourne-road, Handsworth Wood, Birmingham,
October 19, 1894.

"SWEET HOME."

To the EDITOR.

SIR,—I have just learnt, through your journal of September 28, that you have discovered that my picture "Sweet Home," which has just been medalled at the Exhibition of the Royal Photographic Society of Great Britain, was given the wrong title, namely, "A Grey Day in the Meadow," this latter being the title of another picture that I sent.

The kind words of praise which you have bestowed upon "Sweet Home" make me all the more anxious to have it known by its proper title.—I am, yours, &c., R. EICKEMEYER, JR.

Yonkers, New York, October 9, 1894.

EALING PHOTOGRAPHIC SOCIETY EXHIBITION.

To the EDITOR.

SIR,—The Council of the above Society have decided to fetch pictures, *free of charge*, from the Royal Society's Exhibition, on their receiving from the owner the necessary authority and also the number or numbers at present attached to the frames.

All reasonable care will be taken, but the Society will not accept any responsibility for loss or damage.—I am, yours, &c., R. Y. MURPHY.

7, *Argyle-road, Ealing, October* 20, 1894,

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

SIMBAD.—If the pyrogallic acid has become so brown, as described, with age, we should say it was not worth purchasing, considering that, for about threepence per ounce more, you can buy retail a perfectly new and reliable article.

A. B. X.—If the distilled water gave a milky appearance to a solution of nitrate of silver, it was impure, and it might possibly account for the trouble, though it is doubtful. Distilled water from the village druggist is, as a rule, not a very reliable thing.

A. BIGGS.—If the colour rubs off the background "with the merest touch," it is clear there was not enough size in the distemper colour. The remedy is obvious. We should, however, recommend that a coat of size be given the background before it is again distempered.

T. KNOWLES.—The print forwarded is a very pleasing brown, but it is quite a fallacy to call it a sepia colour. It far more resembles Vandyke brown than sepia, but it is a long way removed from either. Nevertheless, as we have said before, it is an agreeable colour. See a sub-leader in another page.

G. B.—The only thing we can suggest is to have three fixed and flexible diaphragms in the camera. These should prevent reflection from the sides, no matter whether the lens embraces a wide or a narrow angle. That one having the widest margin should, of course, be placed nearest the front.

D. WALSHE.—Exposures at this time of year will be much shorter in the Riviera than they are in the suburbs of London. The best practical way of gauging it is to make three or four exposures under different conditions, and develop these plates on the spot. With the experience gained from them, no plates need afterwards be lost from wrong exposures.

W. J.—The only way to learn is by searching at the Patent Office. We have in our mind at least half a dozen patents for attaining the same end as you claim with yours, to say nothing of what has been published. It must not be surmised that a patent can only be invalidated by a prior patent. Prior publication, or public use, is quite sufficient to set it aside, a fact of which many seem to be unaware.

S. J. (Leeds).—We think your town is no exception as regards cutting prices; they prevail everywhere. We should certainly not advise you to come to London with a view to avoiding them. Prices for every kind of photography are as low in London as anywhere else, if not lower, while, as a rule, expenses are very much higher. We should say, seek another provincial town rather than come to London.

A. M. Z. says: "Please tell me how long the metol-cum-hydroquinone developer, with sulphite and carbonate of soda, of which you gave the formula in THE BRITISH JOURNAL OF PHOTOGRAPHY, will keep after making up. I have some now made for some weeks; it seems to work well, but a deposit has formed at bottom of bottle. If you would give me the approximate time of keeping, I should be obliged."—The solution will probably retain its power for several months. The deposit is probably partly organic matter, which should be removed by filtration.

W. G. T.—When plates that have been packed after exposure, with a sheet of printed matter between them, show the printing upon development, there is no remedy of which we are aware.

LONDONIENSIS.—Domestic pets can be successfully photographed by the flashlight, and, in some instances, with better results than by daylight. But care should be taken to secure a good negative at the first attempt, as the animal will rarely submit to a second. A friend of ours secured an excellent negative, by the flashlight, of the family's favourite cat. But puss was not to be found for a day or two afterwards.

H. R. WARRINGTON.—The "office paste" mentioned is very good for the purpose for which it is sold. We do not, of course, know of what it is composed therefore cannot express any opinion as to the effect it would have on photographs mounted with it. If you will ascertain from the makers of what it is compounded, and let us know, we shall be pleased to advise as to its suitability as a photographic mountant.

C. F. P. (Leamington).—What is known at the oil shops as "town glue" is a very convenient form of gelatine for mounting photographs with, and it is also the cheapest; but if the permanence of the photographs is any consideration, and they are silver prints, we should certainly say avoid its use, owing to the impurities it almost invariably contains.

CAPTAIN M. H. HAYES writes: "I'd be much obliged if you'd inform me where I can obtain the chrono-photo. apparatus alluded to in your last issue in second paragraph of second column of page 659; also the date of the issue of *La Nature*, containing description of said apparatus."—In reply: Sorry to say that we have not retained the particular number of *La Nature* referred to. That paper is published at 120, Boulevard St. Germain, Paris.

W. COOMBS.—If two meniscus lenses of equal foci be mounted in a tube, with a stop midway between them, the combination will give straight marginal lines. The visual and chemical foci of such a lens will not be coincident. If, however, the glasses be mounted pretty close together, and the combination is of tolerably short focus, and the image is focussed with a moderately large aperture, and a small stop is afterwards inserted, difference will be a negligible quantity.

CHARLES G. VATCHER writes: "I have just bought *The Photographer's Companion*. In the carbonate of soda developer, page 126, it states: A.—Pure carbonate of soda, 6 ounces; water, 80 ounces. B.—Pyro, 1 ounce; sulphite of soda, 6 ounces; sulphuric acid, 1 drachm; water, 1 ounce. (?) For use, equal parts of each. Is there not a slight mistake in the last two lines, as the dose of pyro per ounce would be tremendous?"—In reply: The quantity of water should be eighty ounces.

PORTRAITURE.—Bigelow's *Manual of Lighting and Posing* is, so far as we know, the only one which would suit your requirement. But it has long been out of print, and we cannot hold out any hopes for your obtaining it, unless by advertising in the American papers. As regards a book on colouring in oil and water colours, try the artists' colourmen's shops in this country. If you have access to a volume of this JOURNAL for 1877, you will find therein a series of articles by Joseph Wake on *Painting on the Photographic Image*, which you should study.

ANTICULL.—If the paper is highly albumenised, it is difficult to prevent the prints from curling. It is a good plan, after they are thoroughly dry, to pass them, face upward, with some pressure backward and forward over the edge of a flat rule or other straight edge. If the prints are soaked in a very dilute solution of glycerine, it will effectually prevent their curling. This method, however, is not to be recommended, as glycerine is a very hygroscopic substance, and moisture would be absorbed from a damp atmosphere, and that would be conducive to fading.

STRUGGLING.—We cannot say the cost, but it is very easy to arrive at it. First ascertain from the local authorities the cost of the current and that of bringing it into the studio, then get estimates from those who make a speciality of electric-lighting plant for photographic studios. The cost of the current, when installed, is very trivial for each exposure, but it varies in different districts, as does the price of gas. The average, however, is about eightpence, per Board of Trade unit. At this price the cost of each exposure, with a six-thousand-candle-power arc lamp, would only be a few pence.

L. BILLING.—If you undertook to do the work as an amateur, what excuse have you for making a charge to the gentleman in whose grounds the groups were taken? If the persons in the groups have not purchased sufficient copies to make it pay you, it is the concern of no one but yourself. Instead of posing as an amateur, we should class you as the worst type of professional, and if you are money out of pocket, instead of making a profit, few legitimate professionals will grieve. The County Court is the place to settle the dispute, and we shall be pleased to hear the result if it is taken there.

*** Several Soeiety Reports unavoidably held over.

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THE BRITISH
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PLATINUM TONING.

The subject of platinum toning for gelatino-chloride paper is gradually working its way to the front in a manner that shows there is no small degree of uncertainty attending the use of gold for the purpose, although the latter metal has held its own practically unchallenged for the last half-century. Platinum salts were proposed, and, indeed, actually used, in the very early days of photography, but never at any time succeeded in gaining any degree of popularity.

Some five years ago, Mr. Lyonel Clark took up the subject in connexion with matt-surfaced papers, following the lead of Mr. Valentine Blanchard, who had introduced commercially a paper that was specially adapted for platinum toning, and which was intended to give results closely resembling real platinotypes. Although Mr. Clark's researches were directed towards quite a different end to that we have in view in alluding to the toning of gelatino-chloride prints, they were specially valuable, inasmuch as they did much to explain the cause of the failure of other and earlier systems of toning with platinum salts.

Briefly, as Mr. Clark pointed out, previous attempts at platinum toning had been made with the platinic salts, chiefly the so-called bichloride, in the formation of which the platinum plays the part of a quadrivalent element, or, in other words, it is combined with four atoms of the univalent chlorine; consequently, in any toning action that proceeds from the use of bichloride of platinum or other platinic salt, four atoms of silver must be converted in order to secure the substitution of one atom of platinum. Supposing the colouring power of the two metals to be equal weight for weight, it is evident that, taking into consideration their different combining equivalents, somewhat less than half the quantity of platinum would be substituted for the silver it replaced.

Mr. Lyonel Clark's experiments were directed towards the production of an image composed wholly of platinum, or practically so; or, to put it in other words, his aim was to attain the ultimate effect possible by the action of the solution, which is a very different matter from the every-day toning process we are all familiar with. In the latter the action is carried to such a point as to give, by means of the combination of gold and silver in certain proportions, an image of a certain desired tone; in fact, the action is arrested far short of the ultimate effect. Now, we all know the effects of over-toning, one of which is, independent of colour, to give a feeble and bleached-out appearance to the print, owing partly to the substitution, in the case of gold as well as of platinum, of a greatly reduced proportion of metal, and partly to other causes.

For the purpose aimed at by Mr. Clark it must be plain that, in order to secure sufficient vigour as well as tone by the use of platinic salts, the paper used must contain a very large proportion of silver in the first instance, and the printing must be carried to such a point as to secure a depth of reduction capable of withstanding the reducing action of the toning agent. If we look at the matter in this light, it is easy to explain why it was possible thirty or forty years ago to tone fairly successfully with bichloride of platinum, where to-day it would be utterly hopeless to attempt it. In those days highly salted papers were employed, whether plain or albumenised, and strong sensitising baths, the printing being carried far enough to thoroughly bronze the shadows and even the heavier half-tones. The negatives employed in those days, too, were many times denser than we are accustomed to now, all circumstances that led to the formation of an image immensely rich in reduced silver, and which not only possessed the capacity to withstand a good deal of reduction, but actually needed it. It is not difficult to understand, therefore, that bichloride of platinum was a practical toning agent for the older papers and under old conditions, but the tones it gave were not so pleasing as those produced by gold.

The chief value of Mr. Lyonel Clark's researches, in addition to demonstrating the weak points of platinic salts, lay in his pointing out the remedy, namely, the employment of platinous instead of platinic compounds. In these the metal is present in the bivalent state, that is, in combination with only two atoms of a monad; and consequently, taking the combining equivalent into consideration again, we find the weight of platinum substituted to be very nearly equal to that of the silver displaced, and proportionately half as much again as in the case of gold. Here, then, we have at once a prospect of a better result, and such proved to be the case as the result of Mr. Clark's experiments.

But even under these improved conditions, if we remember rightly, Mr. Clark advocated the employment of highly salted papers and strong sensitising baths; but here we would again point out the difference between the objects he had in view and those of ordinary toning. In his case the aim was to imitate the rich deep blacks of the developed platinotype print, to attain which end it is obviously a necessary condition that a

solid basis of silver must exist to work upon. From the earliest days it has been a recognised fact, that in order to secure rich black tones, whether with gold or platinum, the image must be rich in silver; and this for the reason that the cold tones given by gold or platinum alone appear poor and flat in attenuated layers, whereas the rich warm colour of the partly organic silver image exhibits a vigour and richness out of proportion to the quantity of metal present.

If we bear these facts in mind, and remember that the toning of an ordinary silver print, whether in albumen or gelatine paper, is seldom, if ever, a case of complete substitution, we shall find the way to success in platinum toning very materially cleared, whereas at present there exists a considerable amount of misconception on the subject. Those who are familiar with the appearance and tones of platinotypes imagine too frequently that it only requires the substitution of platinum for gold to secure platinotype tones with albumen paper; in fact, this appears to be the general impression. In actual practice, *good* black tones, and especially on gelatino-chloride paper, are more difficult to secure with platinum than with gold, for reasons we have already given. The modern gelatino-chloride printing-out paper is greatly inferior in most instances to the paper of former days, and even to the albumen paper of to-day, and owes most of its brilliancy to the organic character of the image, and its richness of tone to the remnant of silver image left in combination with the gold. The gold tone is itself a richer or warmer black than platinum, but we all know how poor and flat an over-toned gelatino-chloride image appears when gold is used. What wonder, then, that it is even worse in the case of platinum?

But, if the warmer tones are sought, we do not here mean abnormally red or brown colours, but the ordinary tones obtained with gold as distinguished from "platinotype tones" or deep blacks, then platinotype promises to behave every whit as well as gold in the matter of colour, and considerably better in other respects. In fact, the very conditions attending its use seem more favourably adapted to use with gelatino-chloride than those of gold.

To allude briefly to the differences, we may point out that whereas, in order to give the best results, the gold solution must be in a slightly alkaline condition, in which state it soon decomposes and becomes useless, the platinous salts require the very reverse or acid state, and in this condition they keep in solution even better than when neutral. When it is remembered that the paper itself is more or less acid, we have at once a disturbing element calculated to cause trouble in the case of gold, and comparatively, if not perfectly, innocuous in the case of platinum; in fact, in numerous experiments we have made, we have come to the conclusion that the degree of acidity of the solution is of very little moment.

What chiefly concerns the success of toning is the absence of free silver, or of unreduced organic salts of that metal capable of conversion by the toning solution. If these dangers are guarded against by careful washing, supplemented by a brief immersion in a weak solution of salt, the toning bath itself becomes a very simple matter, all that is required being a stock solution of chloro-platinite of potassium, with a trace of almost any free acid, nitric, citric, and tartaric being those most generally used. In many formulæ that have been published the strength of the platinum solution seems to be unnecessarily high, one grain of the chloro-platinite to ten ounces of water being with most papers quite sufficient, and this quantity will easily tone a full sheet.

Care should be exercised not to carry the action of the toni solution too far; it is usual, in the case of gold, to direct th the toning be carried on until the colour by transmitted lig is what is required, but how far from correct this is too ma know. With platinum, it may, however, be taken as a f guide, for no change occurs in fixing, and but a very slig cooling of the tone in drying. The bath after use appears keep as well as the stock solution, provided, of course, t prints are thoroughly washed before being placed in it. conclusion, unlike the Eastman Company and Mr. Alexand Cowan, we have got better tones with platinum upon "glossy" paper than on matt.

NEGLECTED PHOTO-MECHANICAL PROCESSES.

The ever-increasing interest now being taken in phot mechanical processes generally by others than those who ar professionally engaged in that particular branch of photo graphy naturally suggests that experimentalists would do we to devote attention to some other of the old processes. We sa other old processes, because the ones that are now more generall followed are but modifications of some that were described, an worked, in the very earliest days of photography. Indeed, it may b said that almost the first process of photography was an engravin process and was closely allied with one now in daily use. As fa back as eighty years ago Nicephore Niépce developed photo graphic images in bitumen, on zinc plates, and afterwards etched the plates with acids, and from them produced impressions in printing ink. This process, slightly modified, is being extensively employed, commercially, at the present time, notwithstanding that it laid dormant for more than half a century.

Take also the method of photogravure that seems to be most in use in this country, and generally known as the Talbot-Klic process. It is but a very slight modification of the process invented by the late Mr. Fox Talbot in 1852, and further improved by him in 1858. By his process Mr. Talbot, five-and-thirty years ago, produced results quite equal, indeed much superior, to some that have figured in recent exhibitions, notwithstanding that the latter had much hand work expended upon them. This valuable process lay in a state of torpor over twenty years, when it was reinvented with slight modification, and exploited by a foreigner.

Various mechanical methods of breaking up the half-tones have from time to time been devised. Talbot imparted a grain by printing through muslin gauze and the like. Woodbury did the same. The method now almost universally used in process work for breaking up the half-tints is with fine diamond ruled lines on a glass plate. This plan is by no means so novel as some modern workers surmise, for, as far back as 1866, the brothers Kossuth, sons of the famous patriot, described the methods they employed for producing grained negatives, one of which was a plate of glass ruled with fine lines by a diamond point. From this it will be seen that those processes which are now most in vogue are not really new ones, but simply old ones, with trivial modifications, resuscitated. Seeing there are several other old processes by which results were produced quite as good as were those at the time by the methods now in commercial use, it will be well to give them some consideration. If some of them were taken in hand and present knowledge and experience brought to bear upon them, it is quite possible, indeed probable, that some at least of them would prove of great commercial value.

The "swelled" gelatine process, for example, which is

ributed to Herr Paul Pretsch, has received little attention of e at the hands of experimentalists, yet it is one by which cellent work, and on a commercial scale too, has been done. he London house we know worked it with slight modification r some years in their daily practice for process blocks, if they not still. This process has a wide range of applications yond that of the production of typographic blocks. Of urse, it is quite unnecessary to remind our readers that the elled gelatine process is based upon the fact that bichro- ated gelatine, when exposed behind a negative, loses its elling properties in proportion to the light's action when it soaked in cold water. Where the action of the light is com- ete the gelatine retains its original thickness, while the other rtions—the middle tints—swell up in more or less high relief.

Some fifteen or so years ago Mr. J. W. Swan invented a ethod which may be termed a swelled gelatine process, and he, it might be surmised, that would prove a valuable one if nly on account of the expedition with which the work could e executed, inasmuch as the negative itself formed the matrix rom which the blocks are moulded. An ordinary gelatino- romide negative, the exposure having been made through a rained screen, is developed in the ordinary way with pyro- allic acid; the plate, after the superfluous moisture has been emoved, is then heated, when a very delicate relief is obtained, vhich can then be moulded from. In this process the be- aviour of the film is very similar to that of a bichromated one. Mr. Swan's process was reinvented some years later, and formed he subject of a patent and the formation of a limited liability ompany to work it.

In the majority of processes, both relief and intaglio, that re now being worked the grain is a mechanical one, and, onsequently, is of the same size both in the half-tones as it is n the shadows. But there is another way, now almost en- irely neglected, of obtaining grain in relief and intaglio work. It is termed the chemical grain, such as that in the Placet process or in the collotype process. The so-called chemical grain is a discriminating one; that is, it is larger or coarser in the shadows than it is in the middle tints, while in the lights it is so fine as to be almost undiscernible. Very fine relief blocks have been made by the chemical-grain method, so have intaglio plates.

It is beyond the province of the present article to refer to all the numerous methods of producing typographic block or intaglio plates, its object being merely to direct the attention of experimentalists to the various discarded, for the time, processes of old, and by which most excellent work was produced. Some of the old processes that, of late years, have been re- suscitated and turned to such profitable account, yielded, at the time of their introduction, no better results than several of those that have fallen into abeyance. Some of these, if taken up and worked with the improved knowledge of the principles involved, would probably become equally as valuable as others that are in daily use. On some future occasion something may be be said in detail on some of the early photo-mechanical methods.

Photography *versus* Hand-work Translations.—Our views on this subject have been too often expressed to be unknown. Should actual photographic results or transcripts, pretty pictures of them by the draughtsman or engraver, alone or combined, be offered as scientific evidence? This question has been well answered by the well-known contributor to the *English Mechanic* referred to in the next column.

Relative Power of Different Lights.—In *Nature* Professor Meldola gives an interesting reference to a dictum of Eder relating to the different photographic intensity of various lights available in photographic work. Expressed in normal candles, the light in a well-lighted studio is put down at 50 to 100,000; direct sunlight, in October, 450,000; electric arc light of 8000 candle visual power, 100 to 300,000.

Flying Machines.—As the flying machine devised and recently built by Mr. Hiram Maxim, as a step forward in the construction of such apparatus, is, perhaps, the first ever publicly exhibited in action, great interest will attach to the exhibition, on Saturday next, at Baldwin Park, Bexley Heath, when it will be shown in action, and an account of its actual past and problematical future given. There were no snap-shottists when Montgolfier first showed how aerial heights could be conquered by his fire balloon; but it will be unfortunate if such an historical event as that arranged for Bexley promises to be should not be perpetuated by the camera.

The Past Summer's Weather.—Photographers need no other proof than the state of business to show how bad the weather of the last six months has been; but it will not be without interest to give some exact details regarding its character. Mr. Charles Harding has compiled, for *Nature*, a comparative record of the summer just gone, and its predecessors for fifty years. We note that, taking the six months beginning with April, there were this year 71 warm, and 112 cold, days. Three summers only, in the fifty years, had fewer warm days, while six others had double the number of hot days. As to sunshine there were, at the Westminster station—which is fairly comparable with all parts of the kingdom—803 hours, which is 130 below the average. The north of Scotland formed a remarkable exception, for there there was an excess of about 100 hours.

"A Fellow of the Royal Astronomical Society."—In the publications of the Lick Observatory have recently appeared some beautiful moon photographs which this authority quite believed to be direct enlargements from the Lick negatives. Instead of being so, they turn out to have been produced in the following way:—They were most accurately squared after the manner of an engraver when copying a picture, and then on corresponding enlarged squares on paper, Dr. Wenerk, by the aid of a magnifier, has drawn "all that he could see—or imagine—on the original, such drawings being once more photographed, and reproduced by heliogravure or some kindred process." Admitting an infinity of skill and care in doing this, "A Fellow of the Royal Astronomical Society" says their absolute scientific value is legitimately open to discussion. And he goes on to point out that the copyist must needs copy all he sees, or thinks he sees, defects and all, and then the result has to be rephotographed with the moral certainty of introducing fresh flaws, and so on. We quite agree with his strictures; photography is too valuable to be tampered with. If we are to have evidence, let it come direct from the witness, and not through the brain of a human being. The legal mind will not have hearsay witness, the scientific should not have "eyesay."

Copying the Faded Writing of Palimpsests.—Our readers will scarcely need be told that a palimpsest is an historically old sheet of writing on which the old characters have been erased, or, if faded, ignored, and the sheet used for more modern writing. Often it has turned out that the despised and rejected words, when decipherable, have untold value, and how to record them in a more legible manner has been a problem in which photography has well aided in solving. Herr E. Pringsheim has lately been experimenting on the subject, and obtained very gratifying results, which he recently brought before the Berlin Physical Society. The manuscript used showed the old writing, which had been washed away to make room for the modern very pale yellow, while the new was deep black. His object was to take a photograph that should ignore the

latter and bring out the former darker and clearer. The first experiment was with a yellow screen only, and gave results visually like the original. Another was taken with an ordinary bromide plate, developed into a hard negative, and then used for obtaining a transparency. The transparency, which gave both writings about the same depth, was then placed on the negative obtained by the screen, so that the images coincided. The background was thus dark in one case and light in the other, and the later manuscript, being also light, showed very little; but, the faded writing being dark in both cases, it appeared in the combination as a deep black on a shaded ground. The difficulty to be encountered was the exact registration of each plate upon the other. To effect this the manuscript and the camera were firmly fixed on an iron stand previous to making the negative, and finally, to obtain exactly coincident lines before the second negative was taken, a piece of plain glass, exactly equal in thickness to the yellow glass, had to be placed before the lens when taking the second negative.

ON THINGS IN GENERAL.

It is rather a day behind the fair to write upon Exhibitions, but the complaint published a week ago in these columns of a gentleman who has sent to the Salon tells one that interest in these matters is not dead. Every one will sympathise with Mr. Wood in the injury his frames have sustained, but it will be valuable as giving to him, and to photographers generally, some idea of what the hangers have to say in the matter of frames. Every one can see the change that has come over frames, as over photographs that are to be considered acceptable. Emersonianism has left its mark, and the famous green frames of a few years ago, conspicuously hung and as conspicuously unbeautiful and unappropriate, at the Royal gave a foretaste of what was coming. They were just about as loud as certain other green frames to be seen in the present Exhibition before they were altered, and possibly, from a similar cause, in each case imperfectly carried out framing instructions. However, to get in the Salon—don't have any ordinary frame; let it suit the photograph if possible; but let it in any case be novel and possibly *bizarre*. Eschew any large area of light mounts, and by no possibility choose a raised gold ornament. To obtain a footing with a good photograph—ditto, only less so. Every unprejudiced visitor to both Royal and Salon will admit that they represent the high-water mark of photography up to the present time—pictures, in the true sense of the term, of a very high standard of merit, and exhibiting the capabilities of light drawing in the direction of art in almost a new aspect. A visit to the two Exhibitions will have considerable educational value to almost any worker, and to see what photography has done and can do is only to be found out by such a visit. With so good a spread of dainty and of solid things we may smile good-humouredly at the droll vagaries of the medal-awarders in a few instances as exemplified at the Royal.

If a letter from a correspondent has led me on to talk about the lighter side of our art as exemplified in the Exhibitions, so another correspondent's communication directs us to the shadows. "A Poor Photographer" states that a wholesale house is running a studio with vignette *cartes* at half-a-crown a dozen. Another photographer, "Focus," writes in the same strain, and shows the system up still more strongly. A third writer, who gives his name, says, "Is this true? If true, why is 'Poor Photographer' afraid of his name?" I do not in a general way, when dealing with matters of fact, approve of *noms-de-plume*, as it is the fashion in England to say, but there are many cases where it is not advisable to give a writer's name. The case in question may be such a one. If "A Poor Photographer" really is poor in purse, he probably owes money to this particular dealer, and would be in a difficulty if he offended the latter, and caused him to ask for payment of "that little account." No, there is no harm in this case in keeping back the name; we only hope that the letter was written under some misapprehension. But, on the other hand, it used to be stated that one large wholesale firm was an important shareholder in a limited company whose business was that of professional photography. There is not much to choose between the two cases. After all, why this pother when there are hundreds of professional photographers at this day sending enlargements, and so on, to firms who, as every one knows, supply private individuals—amateurs or no amateurs?

When I looked at the "Answers to Correspondents" last week, I could not help saying, "Bravo, Editor!" Professional photographers are having a hard time generally the last year or two, judging from all accounts. I really do not think amateurs have much to do with it; photography is a luxury in the main, and luxury dealers are the first to suffer in trade depression. But such beings as the one rebuked by the Editor will injure any one. The reply gives a history in a nutshell: "If you undertake to do the work as an amateur, what excuse have you for making a charge to the gentleman in whose grounds the groups were taken? If the persons in the group have not purchased sufficient copies to make it pay you, it is the concern of no one but yourself. Instead of posing as an amateur, we should class you as the worst type of professional, and if you are money out of pocket, instead of making a profit, few legitimate 'pros.' will grieve." I think that correspondent's ears would tingle when he got his answer.

It is very fortunate that such real, earnest attention is being given to the question of combined and separate toning and fixing bath. There is so much to be said for both sides. One important aspect of the case is, singularly enough, lost sight of usually in discussing the pre-alkaline-bath albumenised prints. In those times, the distinctive peculiarity of an albumen print was that the whites were never pure; a more or less pronounced yellow was always present, and it was the pure white of the alkaline gold bath, when properly used, that was an important factor in making it popular.

One always reads Mr. Andrew Pringle's papers on photo-micrography (Photo-grammatists, there, if you like, is fit food for your etymological gospel!), and the last, published in these pages a short time ago, does but emphasise the advice given by those who know. Do not attempt to make a photo-micrograph for exhibition or sale until you have obtained a typical object or slide in the highest state of excellence to enlarge from.

Verbum sapienti!

Free Lance.

AMERICAN NOTES AND NEWS.

Death of Charles Ehrmann, Ph.D.—We are very sorry to learn of the death of Dr. Charles Ehrmann, of New York, an event which took place on Tuesday last week. For several years he was operator in Kurtz's portrait gallery, and subsequently had charge of the "down-town" electric light-portrait establishment of that artist. He afterwards became associated with the editorial corps of the *Photographic Times*, and of late years was, also, the teacher of the photographic school at Chatauqua, N.Y. Dr. Ehrmann was a man of affable manners, a sound chemist, a good photographer, and a wholly honest man. Many friends will miss him.

Starch a Cause of the Fading of Prints.—A writer in the *American Amateur Photographer*, speaking of the fading of prints, brings up the question whether we have not been on the wrong track, to some extent, in seeking for the cause. The cause about insufficient washing, he says, has been very thoroughly exploded. Hypo, as a cause for fading, is equally an exploded theory. It cannot be the cards, for prints mounted on them from the same object, and different prints on the same card, stand or fade regardless of the card itself. Then, again, the character of the toning has been settled upon as being one of these elements, about which there could be no question. These, quoth he, will all do for arguments, but not as reasons. There is one common condition among all the prints which do fade, and that is, they were all mounted with starch. This is the only uniform condition the writer knows of in regard to faded prints, and, moreover, prints dating for the last thirteen years, made in a commercial way, washed in commercial fashion, and undoubtedly toned with as little gold as it was possible, have stood, and are just as good to-day as when they were turned out of the photographer's

hand. If we are going to have a mountant, let us have a good one. It is the malicious starch paste that has faded the greater part of our prints during the last twenty years—softly, good friend. While quite ready to admit that, in cases innumerable, unmounted prints have not faded, while mounted ones have, how about those that have been made and treated "commercially" throughout, and yet have not faded? We know enough about commercial methods adopted in America to be aware that starch is there employed as a mountant; and, if prints mounted therewith have remained quite good for thirteen years, there cannot, we think, be much to militate against it as a paste. We know only too well that prints mounted with fresh and well-made starch paste have, in many cases, showed indications of fading within a few weeks after mounting, but it has never been brought home to such starch that it exercised a chemical action upon the material of which the print is composed, and until more is known relative to this we must enter a plea of "Not Guilty" on behalf of the starch. But, now that a charge has been made against it, the subject is one which will bear being looked into attentively.

Home Portraiture at Night.—It is the opinion of E. K. Hough, in the *St. Louis Photographer*, that now that the tiny flashlight has evolved into a broad mass of violet flame six feet square, as appears to be the case with the Williams flashlight, it is not impossible that, in the near future, pictures of people will be frequently taken at their homes and business places or social resorts, instead of at the galleries; and, if pictures can be made equally natural and pleasing by artificial light, there will come a great change in the style and location of the places where they are made. Instead of galleries being at the top of high buildings—because in the best parts of the city streets the buildings are usually tall—they may be on the ground floor, perhaps in the rear of a frame and picture or art store, or any kindred business, or come to the front with portraits only in the show windows. In tropical or semi-tropical countries, where a sitting under the sweltering heat of a photographer's skylight is an almost unbearable penance, or in the more than torrid heat of our hot summers in our large cities, if good pictures can be made at night, independent of daylight, people will go for their portraits in the cool of the evening.

A Great Telescope.—The *American Journal of Photography* has it on reliable authority that two of America's moneyed men* have agreed to furnish the greater part of one hundred and fifty thousand dollars (over 30,000*l.*) with which it is proposed to equip a new observatory with a giant telescope, to exceed the Lick instrument. The location of the observatory is to be near the city of Alleghany, and the site has been examined and approved. The mount contains sixteen acres, and commands a view unobstructed by hills or smoke. The lens of the telescope is to be fifty inches in diameter—the greatest yet known in the world—and the tube must be at least sixty-three feet long, requiring a dome more than fifty feet in diameter. The largest telescope now in use, at the Lick Observatory, Mount Hamilton, contains an object-glass thirty-six inches in diameter, but two others are in course of being made which outstrip it—one is a thirty-seven-and-a-half-inch glass for Lowe Observatory, on Mount Lowe, in Southern California; the other is being ground for the Yerkes Observatory of the Chicago University, and will measure forty-two inches. Would that our home plutocrats would follow the lead of those of America!

Self-possession.—In the delightful and always welcome page, "In the Twilight Hour," of the *American Journal*, we read, "The worst devil one can be possessed of is Self." And yet we, in this country, hold self-possession to be a virtue of no small value. *Selfishness* is a devil if you choose, and a bad one, but not self-possession. Let photographers in this country, as well as in America, lay this to heart.

* Andrew Carnegie and another.

HOW TO MAKE OUR MEETINGS MORE INTERESTING AND USEFUL.

[North Surrey Photographic Society.]

In selecting this subject for my paper this evening, I need hardly say that I do not mean to hint for one moment that any of your meetings are even uninteresting or useless; but I expect that your Secretary, like many others, now and then finds that, after the first half, how it is sometimes difficult to start a subject for discussion of sufficient general interest to put what I might perhaps call "life" into the meeting.

Let us take the routine of an ordinary meeting of a photographic society to explain what I mean. Sometimes it does not begin for ten minutes or so after time, and very often we find that the interest of an evening's meeting is nearly thrashed out in the quiet conversation of the small group of members present, before even the minutes of the previous meeting have been read and confirmed.

I must say that I hardly know how this can be prevented. Those members who have anything to bring before the meeting are almost sure to be early, and a question from one of the others, "Have you anything fresh to bring forward this evening?" generally leads in one way or another to the cat being let out of the bag, others join in the conversation, and, before they know where they are, the practical part of the evening's work has been done, and, when it is brought up again after the minutes have been read, the principal interest in the subject has evaporated. And then comes that time during the meeting when one sees the Secretary writing a few words on a strip of paper, which is folded and passed to one of the members. These words are often found to be, "Do start something."

Before this moment has arrived, however, in response to the Chairman's request, some of the members send round a few very fine prints, carefully printed and mounted. These are much admired, but, at the same time, they cause a slight feeling of depression upon the minds of some of the other members who have been, perhaps, experiencing a series of failures lately.

In a few minutes, sometimes, one may catch sight of one of the young members hedging up to an old hand, and take an unmounted print out of his pocket, with a nervous, ashamed look upon his face. He wants to know what is wrong, and how he can rectify it. Now, that is the kind of print that ought to be exhibited at the meeting. If every one could always produce prints equal to those exhibited at our meetings, there would be no need for them, other than for the exhibition of members' work.

But, somehow, do or say what we will, fellows do not care to show up their failures. My first suggestion as to how to make your meetings more useful is this: Have a box placed near the hat and coat racks at the entrance, where members can slip their failures in unobserved; then, during the meeting, if things happen to go a little dull, you can haul in this chamber of horrors, and carefully dissect the contents.

They will often be found to start a series of most useful and interesting discussions, and be the means of imparting a large amount of useful information to your younger members, which would never have been thought of otherwise. Besides, it will tend to show them that they are not alone in producing failures, an idea which we must try to prevent them indulging in.

This chamber of horrors will also often be a help to the older workers, because even they find sometimes that things go wrong from some unaccountable reason, and their pride—I mean that type of pride which is an exaggerated form of self-respect—will not permit them to show their poor work before the younger members. Well, perhaps there is a certain loss of dignity in the operation.

There is another way by which I think we can make our meetings far more useful and interesting, and that is by making them evenings of work, at least for a part of the time. It is of little satisfaction to a young member to be told that a negative would have been a splendid one had he left it in the developer a little longer, or that a print, after it had been toned and fixed, would have been better had it not been so long in the toning bath. What he wants is to have some one at his elbow when he is developing or toning, just to give him a hint how far to go.

There are so many things in connexion with photography that it is impossible to explain in words; for instance, during development, an experienced man can tell by the general appearance of the plate, and knows what to do at once to obtain the best results, but he cannot explain, except in general terms, what is required to be done under the various circumstances.

I will now try to explain how I think that these working meetings can be introduced, and how they will be a help and benefit to all the members of a society.

The room requires to be of a fair size, without any furniture, carpets, or hangings about; a sink with water laid on, and a fixed table to stand an enlarging camera on, for developing shelves, &c. I would have a few pedestals, about four inches square and six feet long, standing about in the room like lamp posts, each with a lamp on the top, showing a non-actinic lamp four ways. Fixed to each side of the pedestal I would have a small shelf, about four feet from the ground, large enough to hold a developing dish and a few bottles. Four men could then stand round each pedestal and develop or tone at one time. One large washing tank

would do for all. But there will be one thing that you require, and that is, a dark lantern of some kind for members to light their pipes from.

Now, in what way would a room of this kind be of use to the members? To the younger ones, many a negative will be saved, due to a kind hint from some one standing by, that would have been wasted had they been developing it at home.

Then, again, amateurs, as a rule, only require to develop a few negatives or tone a few prints at one time; they therefore often waste a lot of material, or put it by to use it again, often to find that it has gone bad when they want it.

With a number working together, developers and toning baths can be made fresh, and all can share the cost, and save a great deal both in trouble and expense.

Then, with regard to enlarging, there are many amateurs who do not care to go to the expense of buying a condenser and lantern, yet who would be very pleased to bring their negatives and some bromide paper. Some of the prints could be developed at the meeting, the remainder could be exposed, the development being done at home.

Then you would find the old members would turn up well at these meetings; they are always interested if there is any real work going on. To them, the thought of a negative to be developed is something like the sound of a trumpet to an old war horse, and I believe that, in time, the Society's working meeting would be found to be quite as interesting, if not more so, than the ordinary ones. What we require is to make them more important centres of photographic work in the neighbourhood; also to attract those who do not do much at present, because they may not have the means or convenience to work at their own homes.

HERBERT S. STARNES.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Autotypé Notes.]

PRELIMINARY to a brief and orderly survey of the principal subjects in the Gallery, it is worth while examining No. 410, an interesting *tour de force* of Mr. J. S. Bergheim. It is a transformation scene, a protest against retouching; the effects accomplished by management in lighting, posing, disposition, and colours of draperies; it is of importance to photographers. In this frame we see three portraits of the same model, the two smaller are of set purpose severely realistic, the lady, doubtless, assisting by mobility of expression,—one is taken full face, the other is less than three-quarter, set at an angle to present her right cheek in an uncomely aspect. The model, a lady, plain certainly, but with lofty, well-proportioned, powerful head, good grey eyes, a stately neck, and, as seen in the full face, the mouth at its centre has delicate suggestions of the Apollo line. In each of this pair the individuality of the portrait is powerfully manifest. From the same model Mr. Bergheim produces, without any retouch, the image of an ideal languorous woman, with exquisitely shaped mouth, her abundant hair in dark masses crowning a head poised gracefully over her left shoulder; he calls her Cinderella, it might have been Eurydice, or any other ghostly personage: "a rose by any name would smell as sweet." The fact that by his art the original presentment has been completely transformed by legitimate means is an example and a lesson to all concerned.

To proceed with our tour, No. 2, *Waiting for the Boats*, by Mr. Dresser, is particularly taking at first sight; the threatening sky, stormy sea, and rush of the tide into the estuary, has a broad, impressive note, but the cart and triad of men in it looms so large, black, and puzzling, that it mars the values of the composition; the longer one looks at it the stronger its discordant note. Mr. Karl Greger has six examples of his careful and charming work, and No. 3, *Evening before the Day of Rest*, with its little fleet of collier craft, the bend in the river, the wherry in mid-distance, the smaller vessels beyond, and the buildings on each side; sky and river suggest a still, evening effect, calm and stillness pervade the scene, and justify its title. His adjoining *Motive on the Dutch Coast*, in the sky, sea, and beach, is very effective, but the figures appear too prominent, and conflict somewhat with the pictorial effect. Mr. Greger perfectly understands the use of matt papers and the value of carbon printing, and obtains breadth of effect without loss of truthful expression.

Crossing the Stream (No. 9), by A. Kapteyn, is an attractive subject, delicately rendered; possibly it might be improved by cutting off some little of the watery foreground, with its shivering reflections of the birch trees in the stream; these are too vivid, somewhat disturbing the harmony; but it is an excellent piece of work.

Mr. Ralph Robinson (No. 17–20) presents four delightful portraits of children, in which charm of attitude and expression, balance of light and shade, and naturalness of effect are conspicuous; they remind one of the late Robert Faulkner's admirable work, are printed in brown and sepia carbon on matt paper, and enclosed in a bronze-stained frame with black line rebate, which, although indifferently put together (probably jarred in transit), is well worth noting as an example of artistic framing. Perhaps the best of the four is No. 18, but all are first rate. On the other side of the room, No. 247, is another portrait by the same hand, deservedly medalled, a refined head and bust of youthful womanhood, the figure presenting all the right shoulder and back of neck to the spectator: an unusual but effective pose; the head, with its mass of hair plainly knotted at back, is seen in indirect profile, the facial expression refined and delicate, "a woman breathing thoughtful breath," a triumph of artistic work, and the frame is worthy of it.

No. 16, *A Study of Cattle*, by J. Wickens, is interesting, the great sweep of pasture and the long line of contented cattle, inquisitive about the intending camera, offers to a student great variety of posture and expression, the sky is a trifle incongruous with the sunlit scene, but the planes of misty distance and the general effect is eminently agreeable.

No. 21, *In Salhouse Village*, has the distinction of a medal; it is a wee bit of a photograph, the rustic scene it illustrates forms an agreeable, well-balanced composition, its pond with ducks in foreground to the left, its rustic cottages standing amid trees and foliage, the light, shade, and balance of the view combine to make it representative of quiet life and peaceful nature, it only needed a camera in the right place, and reproduction by photogravure to be what one sees it to be; certainly there are no special difficulties overcome. Mr. Dennison is author alike of the negative and the engraving. Mr. T. M. Brownrigg receives for an excellent representation of *The Nave of Romsey Abbey* a medal, and we congratulate the veteran on his success. Mr. Browning has, in a long series of years, shown work of a highly competent order produced for the love of it.

Silvery Ripples (No. 33), by Mr. Birt Acres, shows us waves and rocks, sunlight breaking through clouds with charming effect, and printed in special colour, the whole singularly effective, and worthy of the honourable mention obtained. Medals fall thickly in this locality, which, considered the best lighted portion of the gallery, is to be expected. *Where Sea meets Land in Daily Strife* (No. 41) is a remarkably effective piece, and appeals to the eye and the imagination at very varying distances; it is intensely impressionist and pleasantly agreeable; it is suspected of being helped by hand in the tuft of vegetation to the right in middle distance. Artistically, although the tuft is difficult to explain botanically, it is an important feature of the scene. If touched, it should have been entered "Not for competition," but from an art point it has not a touch too much. Nos. 46 and 47, by Walter J. Clutterbuck. These seashore scenes in England and Ceylon are very perfect examples of photography, full of natural beauty and of local interest. Those taken in Ceylon are edifying as well as charming; the skies in all are excellent, and the arrangement of the human interest in the British examples is admirable; very clever miniature work of first-rate quality.

Solitude (No. 32), by J. B. B. Wellington, is a large and ambitious landscape gaining honourable mention and deserving it. It is very near a capital success, all its elements of the stately picturesque, the stretch of water, shallow in immediate foreground, backed by rocky band crowned with tall cedars, ridges of rising land stretching to the left, with dominating stony hills in the distance—it lacks softness and fails in distance, which might have been helped by artful printing. It is, however, an impressive and pictorial photograph, solitude its proper title and keynote. Both Mr. Sinclair and Mr. Atkinson deserve the medals awarded.

Sunset in the Pool (No. 64), in contrast of light and shade is particularly happy; the brilliancy of the major part of both sea and sky emphasises the deep shadows of the moving craft, the blackness of the stream and wharves, and gives a fine impressionist effect.

Easing the Yoke, No. 69, by B. Gay Wilkinson, jun., is a clever performance and bears scrutiny; the expressive natural pose of the resting ploughman, and of the lad with his long goad leaning against one of the six great black beasts yoked to the plough is a treat to see: a quiet hamlet, its church tower rising above the trees in middle distance, a long stretch of undulating country, showing a winding streak of river, beyond the upland fallows stretching to the horizon; a grey late October day, the sun throwing the shadows of the oxen far ahead, make up an effective landscape scene — the print is carbon, on matt paper a trifle too rough for this charming subject. *Sunset on the River*, No. 72, by J. M. C. Grove, the shades of night closing on a crowd of ships in harbour, is powerfully impressionist and contenting. No. 75, *Sunset near Dortrecht*, is another Karl Greger, and worth thinking over. A photograph of simple elements of painter-like quality. No 81, *The Shades of Eve*—Mote Park, Maidstone, by her Grace the Duchess of Sermoneta, is exceedingly effective, received honourable mention, and deserved it, a double image of a bit of the park scenery mirrored in the broad stream filling the foreground, the evening sky full of light, an effective record of natural beauty caught in the camera and perfectly printed.

No. 86, *An Early Morning—Auckland Harbour*, New Zealand, by R. B. Walrond, is, said the critic of the *Times*, "distinctly remarkable," the writer thinks it one of the best if not *the* best thing in the Exhibition. There is much high-class pictorial work at the Salon, but nothing that quite equals this for delicacy of impression and perfection of rendering. We see on the right a couple of schooners moored to a simple pier, beyond a far-off mountain ridge, the heralds of the morn announce the rising sun; the blackness of the shipping and pier seen through the mist contrast with the delicate gradations of the great stretch of calm sea and the distant misty land. All is still, silent, calm, mysterious; a very lovely effect whose significance cannot be expressed in words. One may linger over this original work.

I must get along faster or weary my reader. No. 92, *Evening*, by Charles Job, shows low tide in the river, ships on the mud at the wharf, a beautiful mottled sky, and is a photograph to desire. *The Lock*, by

J. H. Avery, is effective and worth notice; and No. 127, *Head of Coniston Lake*, is a charming example of the intelligent choice of a beautiful piece of country accentuated with living interest arranged to complete the picture, and rendered with competence. No. 133, *Gathering of Great Storm*, is magnificent, of both scientific and pictorial interest. We look down upon a tremendous range of wild craggy mountain tops, about which the storm clouds are wildly gathering, the sky is full of wrath, the foreground and the various planes of distance finely rendered, and the beholder may, to some extent, realise the peril and wonder of the scene. Similar praise may be given to Nos. 158–162, by the same adventurous gentleman.

No. 147, *Harvesting the Reeds*, by A. Horsley Hinton, receives a medal. A difficult composition of life and featureless scenery, but the attempt has been successful; the beauty of the scene is inconspicuous, but it is so managed as to become pictorial. Nos. 145 and 150, a group of three children in red carbon, and four panel portraits in platinum, by Window and Grove, are examples of tasteful and masterly work. No. 153, by J. C. S. Mummerey, has a poetical title, and shows a broad quiet stream gently gliding between meadow banks, the sun declining to his rest. On either bank an angler—each in admirable piscatorial attitude—dots the level middle distance, melting far away to the borders of the sky. It is worth three or four minutes' careful attention, having many excellencies, and giving a charming effect. No. 186, an admirable study of two semi-nude male figures, set in a lovely Italian landscape, thanks to Count W. von Gloeden. *May Blossoms* and *A Gladiolus* are equal to anything of this genus done by their author, Henry Stevens. The three portraits (Nos. 201–203) by Mr. Bhedwar, represent thoughtful work, and No. 208 shows Mr. Karl Greger again successful with *The Wake of the Steamer* on London Thames. No. 222, *Out into the West*, by F. Evans, is very charming and suggestive, and *The Courtyard of the Palazza Vecchio, Florence*, by Henry Little (No. 226), gives us a corner of a splendid colonnade, with its ornate marble columns, its fountain crowned with an infant Bacchus, its Samson in recess, smiting a Philistine with the jawbone of an ass. The photograph is of admirable quality, and has received the tribute of honourable mention. No. 228, H. Wilmer, shows a wooded Suffolk road, capitally photographed, and printed from an excellent photogravure plate produced by the author. *The Mystery of Life* (No. 232) is a bold attempt to approach a Reynolds—a naked boy seated on rocks in foliage contemplates a dead dove. Although unabashedly stagy, there is some merit in the figure. Mr. A. L. Spiller's *Lonely House* is cleverly adventurous, and deserves a minute's attention.

No. 251, *A Nocturne off Cowes*, by Charles R. Whiting, received the honour of mention by the Judges, and No. 262, *Light and Shade*, by Leslie Selby, has a composition of sea, sky, and land, exceedingly effective in a compass of twenty square inches. No. 269, *Peace*. G. Lawley has selected a little bit of the Lake country, which composes perfectly, and supports its title. The three studies by J. Kidson Taylor (Nos. 283–285), are very charming little pastorals. No. 287, *Painter's Corner, Holland*, is a large and admirable study of landscape, marred a little by intrusive branches of trees on the vertical line to the right. Could Mr. A. Kapteyn have lopped these away, his photograph would have been perfect. As it is, we thank him for its eminent pictorial quality.

No. 288, *Solitude*, by Lewis Cohen, has a quite original character, and repays notice. It shows an expanse of wild and romantic scenery, with a sombre and huge pine-tree in the mid foreground, beneath which a solitary traveller, with rifle at his side, halts his grey steed. Shivered rocks strew the immediate foreground; swelling stony mounds in middle distance; to the left, pine forest and the gleam of water in valley beyond reaching towards a sombre, threatening sky. It is a weird and wonderful landscape, vast and ominous, emphasised by the lonely horseman and his steed. It is the most striking and one of the finest photographs in the room.

No. 302, *The Village Farm*, is certainly clever, and is crowded with persons and chattels, the village with its fine church beyond crowns the scenery. The three subjects (Nos. 309–311), by J. Kidson Taylor, are better admired the more they are conned. *A Hampshire Home* receives a medal; this is the best of the three, full of atmosphere, space, and calm, elegant workmanship, of a beautiful brown tone, the completeness recalls work by Colonel Gale. Mrs. J. N. Hignett sends a couple of excellent and telling subjects (Nos. 316, 317.)

The scene from *As You Like It* (No. 320), by H. Yeo, is a creditable attempt at a difficult subject, and No. 322, *Music Hath Charms*, a combined effort by Mr. and Mrs. W. J. Anckorn, is something of a triumph, the boy on chair, trousers pulled far up, and playing the accordeon, is abandoned and admirable, the pose of the girl, and her expression equally good, a little lovely story has never been better told. *The Study* (No. 323), by Fred Hollyer, jun., is a great success, and excellently reproduced by photogravure. Congratulations go to worthy son of worthy sire on the award of a medal to this excellent work.

Study of a Child (No. 329), by H. Spink, is sparkling and attractive. The youngster of Italian type, with wild hair, magnificent eyes, and a Puck-like expression; clothing scanty, posture free and easy, a really capital presentment and performance. Its neighbours (Nos. 330–331) are a laurel-crowned girl, with beautiful face and neck and charming expression, rendered with great delicacy of light and shade, and scores to the credit of Adolphe Meyer. The other, by Wm. Gill, reveals a handsome girl, posed and draped to perfection, resting on a lordly garden seat of variegated marble, which suggests Alma Tadema's work (with a difference!). The glitter of the marble is detrimental to repose and pictorial quality. *La Cascade* (No. 335) in tone and quality resembles a rich mezzotint, and is the best of A. Chattel's four examples. *Launch of the Lifeboat* (No. 347) is first-rate, impressive and picturesque; a success is scored by Wm. Scorer. *Come Along* (No. 352), by Robert Slingsby, is a pretty pastoral; mother and child at the style convincingly rendered; a pleasing and artistic composition. *One too Many* (No. 364) and a *Companion* (No. 375), both by Walter Cassells, are clever attempts to tell a story. The sharp prominence of the furniture (a mistake), the accidents of the composition, more conspicuous than the essentials, detract from the human interest. Matt paper would have improved the prints. Mr. Cassells need not be discouraged.

In making the tour of the Gallery, we have arrived at the scientific and technical division of which the writer has neither space nor inclination to treat, but will specify (474) *Group of* 2400 *People at Windsor*, a big photograph placed over the entrance door, as a remarkable performance and a singular technical success. Professional photographers well appreciate the difficulties of such a commissioned work: it is creditable to Mr. A. D. Kissack.

In conclusion, the writer congratulates the R.P.S. and the public on an Exhibition of great interest and value. It is to be hoped that the Council, in its proper zeal for science, will not undertake the influence of photography on the pleasures and the contentment of mankind. Portraiture and landscape work have enormously contributed to the happiness of the race, enlightening the intelligence and touching the affections. Its votaries in growing numbers believe, and to an appreciable extent prove, that a measure of æsthetic charm can be allied to its verities, giving just that transforming touch which makes the difference between poetry and prose.

W. S. Bird.

ARRESTED MOVEMENT AND A LIVING POSE.

[Photographic Salon, October 24, 1894.]

If an exhibition of pictures has any points of practical value, surely one of the foremost will be that of showing, out of what has been attempted, what may be considered desirable and what the reverse. Experiments have to be made, I mean experiments in picture-making as it is called, but it goes without saying that not all experiments succeed. The subject of movement as arrested by the camera is one that has a vast host of experimenters of a not very serious type, in hand-camera workers, and they offer us—with a few exceptions—a great many results that prove their experiments to be failures. So overwhelming and alarming is the array of snap-shot drivel that one is half tempted, in recoiling from it, to believe that movement of any sort is undesirable for a serious pictorial subject.

Yet, of course, instinct rebels against utterly inanimate nature, especially if that nature includes figures, human or otherwise. Fossils may do for a museum, but not for a picture gallery, at least in Piccadilly. If a figure is used, it must be *alive*, must have blood coursing in its veins; and there comes in the difficulty, one that even painters, with their long years of historical experience, have by no means mastered. And, since this is so, there is less perhaps to be ashamed of in the fact that photographers, with their brief experience, fail too. That it ought to be possible to suggest *life*, pictorially, is certain from the fact that there are many good pictures—good from many, if not from all, points of view—that *do* suggest vitality; pictures that are good in that particular suggestion. That it is possible to suggest *movement* I am by no means so certain. One sees attempts of many kinds—careful, bold, even reckless—at depicting moving figures; and, from the point of view simply of the satisfactory suggestion of motion, I, for one, feel strongly tempted to put it, that the arrest of movement needful for pictorial purposes is not only the arrest of movement, but also the arrest of all impression of movement.

For clearness, it will be best to roughly classify the various kinds of figure pose that are *possible*, and then to eliminate the unvailable. If this will not help directly to a conclusion, it will, at least, narrow the field of inquiry.

We may surely omit from notice the fossil pose the lay-figure pose, the tailor's model pose, the fashion-plate pose, and the show-case pose, all so singularly alike. They are one and all beneath contempt, the more's the pity for the commercial photographer; though this puerility is, doubtless, largely the cause of his going under. The fact is, any amateur can make a photographic fool of his friend; it doesn't need a professional.

The first position that has any possibility of value is the pose of repose, or the statuesque pose, that is, attitude that would be naturally taken and as naturally retained for an appreciable amount of time—one that implies vitality as an inherent necessity, not such a one as might be obtained by bolstering up a figure with balustrades and Japanese screens, with head rests, posing chairs, and other surgical appliances that give you toothache even to contemplate. As a rough example of what I mean, the position that would be assumed and retained by a person holding a book and reading might be taken as a type of restful posing. There may be in this pose, of course, the smallest amount of vitality possible; still there *is* life, however little; and at times there may be much. But,

either way, it is a pose that has in itself nothing necessarily unpictorial; in fact, it is used in the best portraiture, by whatever method, to the practical exclusion of any other. While there is *life* in it, one feels, however, that its chief virtue is its power of expression, of character, thought, or sentiment, rather than of living force. Subjective rather than objective, it is more the pose of inwardness than of action.

At the other extreme there is the pose caught by the instantaneous shutter in a very brief fragment of time. Of this the first criticism one is tempted to make is that a figure is never *seen* in the position that is given, though the accuracy of the fact of it having passed through that position be not disputed. This argument is good enough in its way, only it will not hold altogether, nor yet satisfy, because, in the first place, it is quite easy to *see* a large number of snap-shot positions, if you look for them. But, further, see them or not see them, the positions offend an instinctive idea of what sort of pose is available in a picture.

A man leaping over a pole, if caught by the camera when he is just above the pole, looks to be falling backwards on to it, and to be in imminent danger of breaking his back across it.

In snap-shot work, as such, allowing for some lucky or intentional exceptions, the effect of *motion* is wanting. The figures get into positions they could only possibly be in whilst in rapid movement, and they are then petrified, reminding one in their grotesqueness of the tableau of magic sleep in the *Sleeping Beauty*, where every one retains the position he was in at the fatal moment, no matter how absurd. Take a print of a man performing the high leap, in the position I have suggested, imagine all the rest of the thing to be right—lines, tones, balance, and the rest—and hang it on a wall where you will be looking at it, willy-nilly, best part of the day: how long, how many hours, how many minutes will you be contented to be irritated by such a scientific record of a man about to break his back across a wooden pole? Verily, there is a vast distinction between arresting movement and suggesting it. It is not the untruth to vision that is objectionable and irritating, so much as the disagreement between what the man appears to be doing and what you know he is intended to appear to be doing.

I have an idea of a vague sort that, when a diagram of a moving figure is looked at, the only force that is felt by the onlooker is that of gravitation. Probably all the various theories, and still more remarkable rules about balance and composition in pictures can be traced back to this feeling instinctively after gravitation. But, as regards movement, I would say that, unless it is directly due to gravitation, there must be an unavoidable clashing between the force supplied by the imagination of the onlooker and the force actually arrested by the camera.

Accepting or assuming that an extreme instantaneous pose is not acceptable, my main object is to raise the point of *how much* movement is capable of being satisfactorily suggested in a picture. May we go beyond the statuesque pose? If so, how far short of snap-shot pose must we stop?

Of course, in all matters pictorial or artistic, distinct limitations and sharp definitions of "do this," "do that," are as undesirable as they are, fortunately, impossible. The safest limit, one that seems beyond dispute, is still liable to be successfully passed in particular and exceptional cases. But, notwithstanding, I cannot help thinking that a general understanding—or endeavour to understand—how far movement may be pictorially rendered under normal conditions, may be of much assistance towards the discovery of a satisfactory "living pose," and towards the avoidance of experiments in movement that are foredoomed to failure.

With all respect for the work of painters, great and small, good and bad, which, added together, represents a large amount of practical experience, a gallery of either ancient or modern pictures has little to offer towards the solution of this problem—what to attempt, though usually plenty of samples of what not to. A picture of galloping horses—a whole canvas full of them—each with his four legs off the ground, may be a very clever snap-shot in oil paint, but one feels disposed to quote Rudyard Kipling, with his "It's clever, but is it Art?"

> "We have learned to whittle the Eden Tree to the shape of a surplice peg,
> We have learned to bottle our parents' twain in the yoke of an addled egg,
> We know that the tail must wag the dog, for the horse is drawn by the cart;
> But the devil whoops, as he whooped of old, 'It's clever, but is it Art?'"

But, whether an animal be accurately or inaccurately drawn as regards scientific fact, if it has all its legs off the ground, it wants a lot of suggesting to prevent the feeling that, instead of alighting several feet in front of its forelegs, it is not going to drop straight down on the ground beneath it, breaking its limbs or its back in so doing.

Movement, if it is to be used pictorially, must be suggested by something outside and beyond a correct instantaneous pose, especially when there is anything approaching rapidity about it, otherwise it is no better than a Muybridge or Edison photograph, even though the painter be Meissonnier or a Lady Butler.

Nor even do I find much consolation in the work of that greatest of modern painters, Millet. The legs of his *Sower*, or the potato in the air falling from the hands of his *Potato-sower*, seem to me attempts after the undesirable—attempts, too, that fortunately are not frequent in his work. I cannot help recalling Professor Boys' *Flying Bullets* whenever I look at that unlucky potato. Meissonnier's *Tavern Brawl*, *La Rixe*, and his cavalry charges I would put down as quite irritating; and generally, without quoting especial instances, I believe it will be found that almost all attempts at depicting rapid movement are unhappy, and, if a picture in which such an attempt is made is tolerable, it is usually only so because some other quality which is good more than compensates for the weak point.

In looking through modern books about art—and what unspeakably dull reading they are—and in talking to modern art students, I have been not a little surprised to note the remarkable absence of theory about art. Students and painters, perhaps, have got up some of the stock rules and precepts of antiquity; but they seem to care little for them, and to have quite lost the peculiar state of mind that is ready to theorise afresh on any given topic. Why, a photographer, any photographer, has a cut-and-dried theory on any and every subject you speak to him about. He will dogmatise on art with a very big A in a way that puts poor old Ruskin quite into the shade, and that on the slightest provocation. I can only account for this capacity—or is it incapacity—by the fact that a photographer is bound to have a little scientific knowledge, generally a very little, and that he illustrates the truth of the old adage about the danger of little knowledge. And I have frequently noted, too, that the more scientific the man, the more is he dogmatic about pictures, illustrating in a way the truth of the statement that a single scientific fact is fatal to good art; or, as the point has been somewhat neatly put. "to make a science of art is to make a lying fact of a truthful fiction."

Notwithstanding this, I am going to give myself away by suggesting an idea about the pictorial use of arrested movement, if it must be used at all.

Herbert Spencer points out, I believe, that a picture ought to be nearly, but just not completely, balanced. Perfect equipoise is stagnation or death. Imperfect equipoise, or, as I think he calls it, a moving equilibrium, means life. His suggestion for a picture as a whole is that there shall be just sufficient departure from perfect balance—balance in the widest sense, not merely of composition—to arouse the interest and attention of the onlooker. Now, my idea is that this principle may, with advantage, be applied to the posing of the figure. A position of absolute repose is lifeless and dull; there is too perfect a balance. What is needed is that this balance shall just be disturbed, but not sufficiently for the figure to appear in peril of falling. It is the balance of the figure, not the figure itself, that is to be upset—if you follow the distinction. A man walking, according to this idea, should be represented more nearly as a standing figure than in the extreme position his legs would take at the full stride. A position of nearly standing, but just not standing, seems on the whole the best pictorial "walk." We all know that for the stage there is a special kind of action, gesture, and walk used. We call them dramatic or stagy, according to the point of view or success of the performance. So, it seems to me, we must have a pictorial kind of action, gesture, and walk that shall express to the onlooker all that is intended, and yet not offend the requirements of our art and the conditions under which our pictures are seen.

Leaving the question of the movement of animate nature for that of inanimate, the difficulties are not lessened.

It may be hard to pose a figure, but it is impossible to pose a breaking wave or a wind-blown tree; and almost as impossible to make them seem moving. For instance, how many photographs of wind-blown trees give any impression of wind—omitting, of course, all memory of a catalogue title? I have seen pictures, presumably of broken glass, but which were called photographs of breaking waves, or which were not called, but were all the same, oil-paint copies of them by our R.A. friends over the way, resembling more than anything else a dish of jelly that was broken up because it wouldn't sit.

Of course these things *ought* to be good pictures, because we all know that the art of the new photography is to make a picture of something from a negative of something else. Still, a new photographer does not generally work at any angry sea to obtain a picture of "still life!"

A common suggestion for the expressing of this kind of motion is to prolong the exposure enough to give a blurred image. Except that it is most difficult to keep any definite control over the results, the idea seems good. As a matter of fact, remarkably few successful results seem to be obtained, or, at least, to be shown.

Another suggestion, often made, is to let the movement accumulate, and average itself off, in a similar fashion to what we see in a composite portrait. For example, a pinhole exposure of a waterfall is usually as happy as any other kind of exposure of such a subject. But I confess to not having yet attempted a pinhole picture of a breaking wave; that would demand an enthusiasm for the pinhole I do not pretend to; though, doubtless, if only the hole were large enough, we might get something very novel.

A last suggestion, that may have its use under some conditions, is to employ some kind of line emphasis in the direction of the movement. A horizontal slip instead of a pinhole, or still better, a cylindrical spectacle lens, used to give the same effect. As an assistant in giving the impression of wind, I believe this method to be of great value; though I hardly expect just yet to hear of Mr. Dallmeyer bringing out a new hand camera with a rapid lens giving a large amount of line as aberration. But it may come some time or other, since there is no practical difficulty in the matter.

In starting this topic of arrested movement I have hoped rather to arouse discussion, and so to get suggestions, than to solve the problem. While thoroughly believing that every one will do as he ought to do, ex-

actly as he *can*, if not quite exactly as he would like, in this matter, I still feel that there is a vague limitation which he would be wise not to attempt to overstep. And I offer as my suggestion, that the nearer an instantaneous pose approximates to a statuesque pose the better chance there is of obtaining a satisfactory "living pose."

If the instantaneous pose actually assimilates with the statuesque, so much the better; for, in justice to myself, I must add that I do not believe that any kind of instantaneous arrest of movement is of any pictorial value whatever.

Snap-shots in oil-paint or silver bromide are equally objectionable.

Hand cameras, from their popularity and their labour-saving and laziness-promoting facilities, are responsible for a false acceptance of a kind of work that ought only to be shown for the approval of the man of science, or for that of the visitor to a lantern show. Were the wood of which these dark boxes are made growing on the trees from which it came, and were the leather still undressed upon a living animal's back, it might perhaps so occur that a picture could be made from them, not otherwise. As an aid to the artist, I would trample them under foot, and grind them into splinters and pulp.

I have no doubt I shall be made to suffer for giving voice to this opinion, for the hand camera is the shrine of a wondrous brazen god, that moves with a sudden spring, and, taking you unawares, rends you limb by limb into agonised contortions. And its devotees are fanatics, mad with the new wine mysteriously mixed in the dim incense-perfumed vaults of a Bohemian temple, wherein is kept burning a solitary lamp of ruddy flame. Their wiles are to entrap you into their cages of silver and gold, that they may first show, and then make a sacrifice of you before an assembled host of fellow-worshippers, and this at the dictate of their imperious and omnivorous deity and his insatiable priests, the snap shutter and its manufacturers. Of all such beware!

ROLAND BRIANT.

TIMING DEVELOPMENT.

[Photographic Club.]

I NEED scarcely dwell upon the fact that the object of timing development is to secure what a practical man will call a suitable degree of printing density in a negative, and that by varying the time of development, the ratio of gradation in the resulting print may be greatly influenced and altered.

As I shall, in the course of this paper, frequently have to show, as examples, plates exposed in a sensitometer, let me at once explain that the simple instrument I use is a small camera, taking a quarter-plate. The box is divided into three compartments, and each one illuminated by an aperture. The proportion which the areas of the apertures bear to each other is 1, 5, 25, being roughly the relative illumination reflected from sky, half tones, and grass in a landscape.

I expose this little camera to a white surface, illuminated with two inches of magnesium wire at a fixed distance, and, when comparing the results of two developers, cut the exposed plate in two and develop the halves separately.

In the present example, shown to demonstrate the influence which time of development has upon the final print, the exposed plate has been cut into three, the slips being developed in pyro-soda for four and a half, six, and nine minutes respectfully. I have placed paper prints alongside, and it will be seen how the contrast between the three different tones is increased as the development is lengthened, the slip developed for the shortest time giving a flat print, with but little contrast. Here, then, is a great power over results, for, by stopping development at different stages, the photographer may secure either softness or contrast at his pleasure.

The object of the method which I shall presently demonstrate is to enable the photographer to stop development at any particular stage which he may think desirable, and to do it time after time with accuracy, notwithstanding slight alterations in developer or temperature.

"But," some practical worker will say, "I don't get my results by timing only. I find that weak pyro gives me softness, strong pyro, contrast; that, if I over-expose, I can still get good results by using plenty of restrainer, and adding the alkali a little at a time: and, even in under-exposure, I can bring out the detail by soaking in a alkali first."

Now, it is perfectly true that the photographer often attains the result aimed at by making these modifications, but it is also true, as pointed out by Messrs. Hurter & Driffield, that the sole result (fogging always accepted) of any and every alteration is to alter the speed of development, and that at any given stage of development (any given opacity of the highest light) the other tones will always bear a definite ratio to it, this being fixed by the exposure, and quite unalterable by development. It therefore follows that the widest attainable range of control can be secured by using a uniform developer, and stopping at any particular stage of its action.

I find it peculiarly difficult, in face of what we believe to be our practical experience, to fully embrace this new knowledge of the action of developers, and I have made a considerable series of experiments demonstrating it. In each case the developed plates are halves of one exposed in the sensitometer or on a landscape, and although the halves are treated differently, the aim has been to stop development in both at the same stage, that is, when the highest light has reached the same printing opacity.

I do not rely upon the eye, or even upon measurements in the photometer, in comparing results, but take a print from the two halves on a lantern plate for comparison. This is because modifications in developer often cause marked variations in colour between the two halves, and a thin-looking negative of a warm tone is often, as you will see in the examples, equal in printing opacity to one with a black deposit, which has visually greater density and contrast.

I pass round these examples, each with their resulting print, for examination.

Experiment 1.—*Bromide.*—Normal pyro-soda (½ grain bromide), appeared in 1 minute, developed 3 minutes. Compared with same developer, with 2 grains extra bromide, appeared in 130 seconds, developed 6½ minutes.

Result.—The bromide has lengthened time of appearance and also development necessary, and has given a negative of greater contrast optically, but has failed to make the slightest alteration in printing gradation.

Experiment 2.—*Amount of Pyro.*—Four grains pyro-soda, appeared in 2¼ minutes, developed 6¾ minutes. Compared with 1 grain pyro-soda (the same solution diluted), appeared in 2¼ minutes, developed 13½ minutes.

Result.—Again a difference in colour, but printed results identical. Variation in amount of pyro has no effect on results beyond altering time of development.

I have proved by many trials that ordinary variations of alkali have no effect with any of the developers beyond altering time of development (always excepting fogging action), and my next experiments illustrate the fact that the extreme measures which photographers often resort to in dealing with over or under exposure have no result beyond quickening or retarding speed of development.

Experiment 3.—*Strong Pyro with minimum Alkali* versus *Normal Pyro and Alkali.*—Pyro 8 grains, soda 8 grains, bromide 4 grains, appeared in 7 minutes, developed 27½ minutes. Compared with pyro 2 grains, soda 12 grains, bromide 1 grain, appeared in 1¼ minutes, developed 5 minutes.

Result.—In spite of the fact that the strong pyro was so restrained that the half-tones had not appeared when the development of the other half of the plate was completed, this special treatment is powerless to make the slightest difference in gradation of resulting print, the colour of negative is very different.

Experiment 4. — Tentative Development. — Over-exposed landscape, 2 grains normal pyro-soda, appeared in 2¾ minutes, developed 8¼ minutes. Compared with pyro 8 grains, soda 7 grains, bromide 4 grains, appeared in 20 minutes, 2 grains more soda added, developed 34 minutes.

Result.—8 grains pyro, much the blacker negative, and developed a little too long to pair accurately with the other, but no sign that tentative development had altered gradation.

In the following two Experiments the method of previously soaking in alkali is contrasted with previously soaking the other half in pyro and bromide, in order to see whether over or under-exposure can be controlled by these means. Both trials are on landscape subjects.

Experiment 5.—Under-exposure (1/10th normal).—Soaked in 2 grains pyro, 2 grains bromide for 5 minutes, then 6 grains soda added, appeared in 12 minutes, developed 32 minutes. Compared with soaked in 12 grains soda for 5 minutes, then 2 grains pyro and 1 grain bromide added, appeared in 3 minutes, developed 9 minutes.

Result.—Again, identical results with the two halves; there is no power to bring out detail, and at the same time hold back the high lights.

Experiment 6.—Over-exposure, procedure exactly as in Experiment 5. —Previously soaked in alkali, appeared in 1¾ minutes, developed 7 minutes. Compared with previously soaked in pyro and bromide, appeared in 6 minutes, developed 27 minutes.

Result.—Identical results in the two halves; no evidence of power to keep the shadows clear while the high lights are being built up.

The question might be asked whether the same result will follow in the case of ammonia being used as an alkali in place of carbonate of soda. The trials I have made (by no means extensive ones) point to the conclusion that ammonia has no greater power of altering gradation than soda, except where it is used in such an unrestrained state as to cause actual fog, in which case more fog seems to be deposited on the shadows than on the high lights, and less contrast results.

The net result of these experiments (only a few out of a large number all pointing to the same conclusion) is that the supposed power exercised in "tentative development," or in "pushing development," exists only in the imagination (the power of controlling fog always excepted), and that the only power a photographer possesses is to stop development at the exact point at which the gradations are suitable to his purpose. Beyond quickening or shortening the time necessary to reach this stage (and controlling fog) there is no advantage in modifying the developer to suit various subjects or exposures.

Having cleared the way to the investigation of this all-important power exercised in timing development, I am free to explain the new and original method which I have found most successful in practice. It is based on my discovery of the fact that most influences which lengthen or shorten the time necessary to reach a given printing density also

hasten or retard the time of the first appearance of the half-tones of the image in the same ratio.

For instance, if with a 2-grain pyro developer I find that I get a correct result by developing for a total time of four times the time of appearance, I shall be sure in future of getting a similar printing result by always developing for four times the time of appearance, even although there may be variations from the first trial in amount of bromide or alkali, or in temperature.

The "four times" quoted above I call the multiplying factor; in this instance 4 would be the correct multiplying factor for me, with a 2-grain pyro developer, although another photographer, who prefers a thinner negative, would get the result *he* likes by using a multiplying factor of $3\frac{1}{2}$.

The multiplying factor is not alike for all developing agents; for instance, taking 4 as the standard for a 2-grain pyro solution, hydroquinone will reach the same degree of density if it is developed for about three times the time of appearance; eikonogen, 5; metol, 16; glycin, 8; amidol (2 grains), 10; and velox, 7. The kind of alkali used sometimes alters it (although the *amount* does not); for instance, with pyro the use of potash permits smaller factors than with soda.

The time of appearance is the time which elapses between pouring on the developer and the very first appearance of the half-tones (such as the grass in a landscape subject). In theory it may seem difficult to decide which part of the image is to be taken as the guide; in practice, I have never found the slightest difficulty. In practice my method is perfectly simple; the developer is poured on, and the surface of the plate carefully observed; the sky or high lights are allowed to appear, but the moment the half-tones (not the deepest shadow details) are first seen, the time is noted. This period of time (the time of appearance) is multiplied by the multiplying factor which previous personal experience has proved to give with the plates and class of developer used, the density the photographer prefers.

The use of a watch and pencil and paper for this process is decidedly inconvenient in the dark room, and I have therefore devised a simple clock for the purpose, which I call the eikronometer. It has a ten-minute dial, and the minute divisions are therefore large and easily seen in the dark room.

The hand is always set at 0 as the developer is poured on, and the time of appearance noted on the dial; a simple slide rule on the circumference of the clock gives the total time of development, at which figure a movable indicator is set; when the hand reaches the figure indicated the development is complete.

I think that my method provides a means of expressing in definite terms certain important characteristics of developers, which have been up to now only vaguely alluded to.

I take, for instance, two widely different developers — hydroquinone and metol. We are usually told that the former tends towards density and the latter towards softness in the negative; but, when I say that hydroquinone has only to be developed for three times the time of the appearance of the image to give the same results that are gained by developing with metol for sixteen times the time of the appearance of the image, I think I am putting the fact in a much more useful way.

Let us examine a few other facts connected with this new method.

Pyro.—While with most developers the multiplying factors remain unaltered if a diluted developer is used, this is not the case with pyro.

Take an exposed plate, cut in three parts, develop one with a 4-grain solution of pyro, another with the same developer diluted with equal bulk of water (2-grains), and the third with still more diluted (1-grain). The half-tones of all three images *will appear at the same time;* but in order to get uniform density in all, the development should be timed as follows:—The strongest developer, three times the time of appearance; the next, four times; and the weakest, requires seven and a half times. This explains the reason why most workers, taking unconsciously the appearance of the image as a guide, find that they get increased contrast with strong pyro (because they develop too long), and a tendency towards softness or thinness with weak pyro (because they develop too short a time). As I have shown by a previous example (Experiment 2), the results with weak and strong pyro are identical if each is developed to the same stage—it is simply a question of accurate timing and a knowledge of the relative multiplying factors.

Bromide.—The fact that the time of appearance makes correct allowance for the addition of bromide to the developer is demonstrated in Experiment 1, the multiplying factor used being 3 for both halves. I think an examination of these negatives will show why bromide has the reputation of increasing contrast. The half developed slowly with bromide *appears* to have greater relative opacity in the high light, but, tested in the printing frame both halves are alike. With hydroquinone (and no other developer to my knowledge), bromide shortens the multiplying factor. The extremely short time in which density follows the appearance of the image with hydroquinone used with plenty of bromide, explains its value for copying black-and-white; the high lights gain sufficient density before the time of appearance of the faint reflections from the black is arrived at.

Variation in Exposure.—There is, as is well known, a considerable range of exposure within which good negatives can be got, and this range depends upon richness of the plate. If varying exposures are developed to secure uniform gradation, in the resulting prints the shortest exposure will have to be developed to secure a thin negative, and the longest exposure a dense one. The usual tendency among photographers is to *over*-develop exposures tending to under-exposure, and to *under*-develop over-exposure.

Example 7.—Varying exposures, $1\frac{1}{2}$, 3, 6, and 12 seconds on Ilford ordinary; all 2-grain pyro-soda developer; landscape subject; multiplying factor for all, $3\frac{1}{2}$.

Exposed	$1\frac{1}{2}$	seconds,	appeared	$3\frac{3}{4}$	minutes,	developed	13	minutes.
,,	3	,,	,,	3	,,	,,	$10\frac{1}{2}$	,,
,,	6	,,	,,	$2\frac{1}{2}$	,,	,,	$8\frac{3}{4}$	,,
,,	12	,,	,,	$2\frac{1}{4}$	,,	,,	8	,,

The resulting paper prints are shown for comparison. The $1\frac{1}{2}$-second negative is too near the borderline of under-exposure; but, on the other hand, I am sure 24 and 48 seconds' exposure could have been given, and good negatives—only rather dense—would result.

Different Developers.—Although they vary greatly in multiplying factor, I, so far, have been unable to detect that any developer offers any advantage over others in the exposure required; in other words, that all developers seem to give the same gradation if developed to a corresponding stage. In one or two cases of apparent exception to this, the cause was found to be a distinct deposit of fog with the developer, which seemed to give greater rapidity. It is curious how a hearsay reputation of a particular developer is handed from one to the other without much foundation. For instance, glycin is said to be suitable only for black-and-white subjects, whereas it possesses exactly the same power of rendering delicate gradation as any other developer, but is rather slow in action.

In using any of the modern developers with my system, the time of appearance as a rule makes all requisite allowance for variations in strength, alkali, bromide, and temperature. (I have not tried rodinal.) The exceptions are that with amidol the multiplying factor alters if the strength (grains to ounce of amidol) is altered, and with hydroquinone the amount of bromide makes a difference in the multiplying factor.

Various Brands of Plates.—I am inclined to think that little variation in the multiplying factor need be made for this. Some plates are slow developers, but the time of appearance seems proportionately slow. I have not, however, systematically investigated this point.

The conclusions I come to on the whole matter may be summed up as follows:—

1. That the selection of the developer is only important in as far as it ensures freedom from fog and a convenient length of development, and that it is, therefore, most convenient to adhere to a uniform formula.

2. That, while length of exposure gives the chief control over results, the timing of development gives the only remaining control.

3. That, using a uniform developer, an observation of the time of appearance of the image gives an accurate indication of the relative time required to reach a required stage of printing opacity, even under the accidental variations met with in practical work. ALFRED WATKINS.

MOUNTING AND FRAMING.

[Hackney Photographic Society.]

THE matter of mounting and framing, of which I propose to treat this evening, is a subject of considerable interest to the photographer, and one which of late years has been more generally brought to the front, and with the best results.

There is no doubt, I think, that our late Photographic Exhibitions show a considerable improvement in the general appearance of their walls, and this fact alone, in Exhibitions where such latitude in framing is allowed, indicates a probable improvement in taste or, at least, an effort of thought in that direction.

Now, photographers as a body seem to have sadly neglected the great power at their disposal for placing their work at the best advantage, and yet the art they practise is, in its results, more directly affected by the exhibition of good or bad taste in this matter than are the results of almost any other art which attempts pictorial representations of nature.

We may, I think, find the reason for this conclusion in the fact that photographs cannot, except to a small degree, become the vehicle of the imagination and the individuality in thought and feeling of their producers, whereas the productions of those arts ordinarily termed the fine arts rely chiefly upon the artist's capability for communicating to us thoughts or ideas — his thoughts or ideas — and affecting thereby our emotions, imaginations, and thoughts, through the sense of sight, which, of course, in pictorial art, is the channel for all communications. Now, in the proportion that any work of art speaks less clearly and distinctly to our finer feelings, in that proportion does the necessity for the frame increase, for the function of the frame and mount is first and foremost to regulate the sense of sight, and this requires little guidance when our imagination and thought are strongly evoked.

We may say that mounting and framing, looked at from an artistic standpoint, are practically the same, and the only qualification requisite for successful operation in this field being good taste and thought, for the individual who has sufficient artistic feeling to produce a good

picture by any means will have ample instinct to mount and frame it in keeping, provided he will take the trouble to do so, as the greater capacity necessarily embraces the lesser.

This being the case, it is only possible to make broad and general observations on the possible lines which lead to success or failure.

On the other hand, as far as I have observed, the mechanical operation of affixing a print or picture to a suitable mount is a matter of such extreme simplicity that success is ensured if only *ordinary* care be brought into play.

Looking over the subject broadly, then, I can find little which I may call new or of absorbing interest, but what little I have found which may be of benefit to you I give you for what it is worth, and perhaps it will be best to approach the subject from the most practical side, and presume for the present that we have suitable mounts ready, and prints to fix thereon.

Now, there are any number of prepared mountants to be obtained from dealers, most of which, doubtless, work very well; but, for simplicity of preparation and ease of application, good, stiff starch paste, freshly mixed and free from lumps, is not to be beaten. It should, however, be used cold, and must not be allowed to cool in contact with the air, or a hard scum forms upon the top, which, if brushed on to a print, will give objectionable lumps.

There are, however, cases in which wet starch paste is not a desirable mountant, as when an artificially matt or burnished surface has been produced, say, for instance, upon gelatino-chloride paper, for then the print becomes more or less saturated with moisture, as it should before mounting with starch paste, and some of the dulness or sheen is sure to go.

Where prints have been squeegeed down upon glass or other support they may be well coated with starch paste whilst still wet upon the glass, and, when dry and stripped, simply laid in their proper places upon mounts which have been surface-damped, and then put under pressure, when they will adhere without any loss of surface.

In the case, however, of gelatino-chloride paper, or, for that matter, prints upon any other paper which are not of very large size, a mountant composed of gelatine and alcohol is, I think, undoubtedly better. This, if applied with care, will not disturb the glossy surface, and, at the same time, is more powerfully adhesive than starch. It is to be bought ready prepared of most dealers; that which I am in the habit of using is obtained from Messrs. Shew & Co., of Newman-street, and works very well. This mountant is solid when cold, and must be prepared for use by standing the bottle in a jug of hot water, when it will melt, and should be used as hot as possible.

The print is best laid face downwards upon a clean sheet of blotting-paper, and the mountant applied rapidly and evenly over the back of the print with a stiff bristle brush. The print is then immediately placed in position, and pressed down all over with a clean linen handkerchief or a roller squeegee over a clean sheet of paper, but, if using the squeegee, great care must be taken to have very little mountant upon the back of the print, or it may exude from under the edges.

This mountant may also be applied to the edges of the print only by cutting a sheet of paper, say, a quarter of an inch shorter each way than the print required to be mounted. Lay the print, as before, face downwards upon a clean sheet of blotting-paper, and place the piece of cut paper upon the back of the print. This will then show a narrow margin of one-eighth of an inch of print all round, to which the mountant is applied, and the print adjusted and pressed down round the edges as before, but care must be taken to have the prints just slightly damp when using this method.

For my own part, I always use this gelatine mountant, as I find it more adhesive, and the edges remain in closer contact with the mount than always happens when starch is used, especially if the prints are dried in a warm room or at all rapidly.

If it is only required to mount the prints with just the natural surface of the paper, prints, say, such as bromide, gelatino-chloride, &c., the best and most effectual method is to soak the print for a minute or two in cold water, and placing the same, face downwards, upon a sheet of previously wetted paper, blot the surface moisture from the back, and rapidly go over with a hog's-hair tool charged with hot gelatine mountant, lay the print in its exact position upon the well-dusted mount, and run a flat rubber squeegee up and down to express air bubbles, or, if a large print, work the squeegee from the centre outwards in all directions; then lay the mount flat to dry, and, when sufficiently hard to prevent sticking, place the mounted prints face to face with a clean sheet of paper between, and press between a pair of boards with a heavy weight upon the top.

If this method be adopted, no trouble will ever be experienced with loose corners or edges or partially stuck prints; but, of course, the prints must be placed under pressure for a time, or rolled, as the damp print, contracting, is certain to bend the mount unless very stout.

Theoretically the mount should be equally saturated with the print, but this is very often impossible to do, as the mount would be spoiled or injured.

It is advisable to have the position of the prints clearly marked at the two top corners, unless there are some guiding lines upon the mount, as it is difficult to move the print upon the mount when once down, for this mountant congeals very rapidly, and, as I believe I before mentioned, the mountant should be applied as warm as possible, when it is much easier to work than if only tepid.

For large prints, starch paste will undoubtedly be found easier and better to work, and, if the perfection of evenness is to be obtained, the print must be saturated with water until thoroughly limp and swelled, and then pasted and laid down upon a canvas or sheet of stout paper previously strained over a wooden frame; the frame is then turned over with the picture adhering to the front and laid face downwards upon a clean sheet of paper, and the cloth or paper backing rubbed well into contact from the back, working always from the centre outwards, and using, if necessary, a wet sheet of paper to prevent the print sticking thereto. By this means air bubbles are squeezed out, and when the print is dry the utmost flatness is obtained.

For ordinary small prints, a ¾ inch or 1 inch flat hog's-hair tool is the best brush to use, and should be tolerably stiff; a flat squeegee is also a most useful instrument for running over the face of the prints and working them out flat, and getting the edges and corners into close contact, and may be used directly upon the face of wet gelatino-chloride or bromide prints without fear of damage.

Whenever photographs are to be affixed to mounts it is very desirable to have the best cards, as the chemicals used in bleaching the commoner varieties, and left in large quantities therein, are very deleterious to the permanency of prints.

We may, I think, now leave this, the more commonplace side, and consider the reasons for mounting and framing, and the general regulations arising therefrom to which it is more or less necessary to conform if we wish to avoid falling into errors.

Roughly speaking, photographs and most efforts of pictorial art in colour, in monochrome, are mounted or framed or both, for the following reasons:—

(1) For protection.

(2) For the purpose of forming a boundary to the picture and isolating it from all surrounding objects, which would otherwise tend to distract the attention and lead the eye away from the general scheme of composition.

(3) As a means of strengthening or subduing colours or values by means of adjacent masses of colour, or lights or darks, or other reasons such as giving reasonable importance to the size of small works, altering or accumulating the proportions &c.

If, then, we take these reasons, and work from them, at once we see that, to afford proper protection, the frame must be enlarged.

That, as we design a mount and frame to form a boundary to the picture, it must be of sufficient breadth and quietness to be unattractive to the eye, and that, as far as isolating the picture is concerned, the frame must be of such importance, shape, and colour as to form a sufficient border to prevent other extreme objects drawing the attention.

J. C. S. MUMMERY.

(*To be concluded.*)

News and Notes.

THE date of the opening night of the Polytechnic photographic classes has been unavoidably altered to Thursday, November 8.

MR. CLAUDE DE NEUVILLE, who, like Messrs. Aubrey Beardsley, Phil May, and Herbert Railton, gave birth to unique methods in "black-and-white" art, is hard at work on drawings of Oxford architecture.

THE Oxford Art Society's fourth Exhibition, now open, is a great improvement on those of former years, the chief contributors, as usual, being Professor Herkomer, Messrs. A. Macdonald, G. P. Churcher, and E. Gouldsmith.

THE PHOTOGRAPHIC EXHIBITION.—Lantern fixtures for the week:—Monday, November 5, slides by Messrs. F. A. Bridge and A. Bridgeman, *Western Norway*. Wednesday, November 7, slides by Mr. Edgar G. Lee. Saturday, November 10, slides by members of the Newcastle-on-Tyne and Northern Counties Photographic Association.

MR. EDGAR CLIFTON writes: "Permit me to correct a slight error in your report of the last meeting of the Royal Photographic Society. The 'Black Band' enlarging apparatus will enlarge from any sized negative which the condenser will cover to any required larger size. The other apparatus, which enlarges from one specific size to another, say, quarter-plate to whole-plate, is called the 'Snap-shot Enlarger.'"

THE following firms have definitely booked spaces at the Stanley Show:—Adams & Co., Butcher & Sons, Airs & Co., Shew & Co., J. Haunam, the Vedette Camera Company, J. Cheney, Wormald & Co., Hare & Co., Platt & Witte, J. Goold, and others have promised, but up to present date have not settled upon positions or space. The picture division will again be a very strong one, as Mr. Welford, the manager of the Photographic Section, has already had entries from many of the best workers both of England and America.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 20,229.—"An Improved Roll or Spool upon which Flexible Photographic Films are Wound." J. B. B. WELLINGTON.—*Dated October*, 1894.

No. 20,303.—"The Photo-holding Calendar or Advertiser." R. G. EVANS.—*Dated October*, 1894.

No. 20,343.—"Improvements in Photographic Apparatus." Communicated by L. Joux. A. J. BOULT.—*Dated October*, 1894.

No. 20,377.—"Improvements in Photographic Cameras." J. WILSON.—*Dated October*, 1894.

No. 20,436.—"Improvements relating to the use of Type-writing Machines in combination with Photo-mechanical Processes." J. T. ARMSTRONG and G. F. WETHERMAN.—*Dated October*, 1894.

No. 20,610.—"Improvements in the Manufacture of Glass Bottles and similar articles." W. B. FITCH.—*Dated October*, 1894.

No. 20,567.—"Improvements in or in connexion with Carriers or Holders for Photographic Films, Cards, and the like." H. R. COOK.—*Dated October*, 1894.

No. 20,571.—"An Improved Dark Slide for Photographic Cameras." B. WILKINSON.—*Dated October*, 1894.

No. 20,600.—"Improvements in Photographic Printing Apparatus." J. W. SHAW and H. W. CHINNERY.—*Dated October*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
5	Camera Club	Smoking Concert.
5	Central Photographic Club	*Carbon Printing.* John H. Avery.
5	North Middlesex	Informal Discussion.
5	Peterborough	
5	Richmond	*Photo-micrography.* Dr. T. Charters White.
5	South London	
5	Stereoscopic Club	
6	Birmingham Photo. Society	
6	Bolton Photo. Society	
6	Brixton and Clapham	Competition Slides, "Holiday Work," by Members.—Demonstration with the Lantern Microscope, by R. G. Mason.
6	Exeter	
6	Hackney	Open Night.
6	Herefordshire	
6	Keighley and District	
6	Lewes	
6	North London	
6	Oxford Photo. Society	
6	Paisley	
6	Rochester	
6	Rotherham	
6	Sheffield Photo. Society	
6	West London	
6	York	
7	Croydon Camera Club	*Our Royal Palaces.* Horatio Nelson King.
7	Edinburgh Photo. Society	
7	Leytonstone	
7	Photographic Club	Annual General Meeting.
7	Southport	
7	Southsea	
7	West Surrey	*A Photo-micrographic Gossip.* T. Charters White, M.R.C.S.
8	Birkenhead Photo. Asso.	
8	Camera Club	*The Teeth of Fishes.* Dr. C. S. Patterson.
8	Cheltenham	
8	Ealing	Demonstration by the Photo-Autocopyist Company. Mr. Taylor.
8	Glossop Dale	
8	Hull	
8	Leeds Photo. Society	*New Printing Processes.* B. A. Burrell.
8	Leicester and Leicestershire	
8	Leigh	Seascape Competition.
8	Liverpool Amateur	*Eastman's Printing Papers.* A. C. Baldwin.
8	London and Provincial	Lantern Entertainment. Mrs. Catherine Weed Ward.
8	Manchester Photo. Society	
8	Oldham	
9	Bristol and West of England	
9	Cardiff	
9	Central Photographic Club	*Windsor Castle in the Jubilee Year.* W. Brooks.
9	Croydon Microscopical	
9	Halifax Camera Club	
9	Holborn	
9	Ireland	
9	Maidstone	
10	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 25,—Mr. R. P. Drage in the chair.

Mr. H. Faulkner was elected a member.

Mr. J. TRAILL TAYLOR gave an address on some unrecognised uses of single lenses. He divided his remarks under the three headings of the single achromatic landscape lens for quick portraiture, for ordinary work, and for copying and architecture. For the first, a plano-convex lens, if the convex surface were directed to a sitter, would take a portrait without any stop at all, but the covering power would be very small. It was enough, however, to enable sharp viginetted busts to be taken, and the knowledge of this might prove useful to a youth who had but little money to spare. His own first portrait lens was one of this nature, and he exhibited several prints taken by its agency in those days when processes were slow. When a single lens was of a pronounced meniscus form, it had been recommended by the elder Dallmeyer to turn the round side to the view, and have a stop a little way behind it. The great value of single lenses was not adequately realised. He showed one that, for portraiture, could be worked with a *f*-8 diaphragm, and he exhibited architectural and other prints taken by that same single lens in which there was no perceptible distortion. The lens in question was of the *tria juncta in uno* class introduced by Dalmeyer in 1865, since which time he had it more or less in use, subject, however, to a modification in its mounting, which was explained. Specimen photographs were submitted in illustration of the various effects obtainable by well-made single lenses.

A discussion followed, in which Messrs. W. E. Debenham, T. R. Dallmeyer, Everitt, Welford, and others took part.

At the conclusion of the meeting, Mr. Taylor showed two large panoramic photographs, produced by plane perspective by Mr. W. H. Jackson, of Denver, Colorado.

PHOTOGRAPHIC CLUB.

OCTOBER 24,—Mr. Alexander Cowan in the chair.

Mr. Tottem showed a picture from a negative which had received a double and identical exposure. There was a perfect halving of the landscape, the clouds being shown in both halves. He made the double exposure for a special purpose, but was surprised to find how the foregrounds had been entirely obliterated.

Mr. COWAN said it was neither more nor less than could be expected. If developed long enough, the foreground would have been shown slightly.

Mr. ALFRED WATKINS, of Hereford, read a most interesting paper upon *The Timing of Development with Different Developers*, which he illustrated by means of negatives and positives set in frames. Comparative tests had been made, the two halves of a plate which had had one and the same exposure being developed with differently constituted developers. Mr. Watkins said that, although he had exposed thousands of plates, he had by no means exhausted the subject.

It was evident, from the rapt attention of a large audience, that his last remark was true, and that the subject was an important one.

At the conclusion Mr. TOITEM proposed that a very hearty vote of thanks be passed to Mr. Watkins for his exceedingly interesting and well-rendered paper, and asked that he would permit the Club to publish the paper in full.

The CHAIRMAN said that it was scarcely necessary to put the vote to the meeting, for they had forestalled him by their acclamation.

Mr. WATKINS thanked the meeting, and was pleased to hand the paper to the Chairman on behalf of the Club.

A very animated discussion ensued, in which Mr. Edwards, Mr. Mackie, Mr. Fry, and the Chairman took part.

Mr. EDWARDS asked if the timing of development was the only control a photographer had?

Mr. WATKINS said yes.

Mr. EDWARDS thought an over-exposed plate could, with a properly constituted developer, be developed so as to give a very fair negative. He asked if Mr. Watkins had tried eight grains of pyro and an excess of alkali?

Mr. WATKINS requoted a formula from his paper, which was highly restrained, retarding from two and a half minutes to twenty minutes.

Mr. EDWARDS referred to an experiment previously made at the Club, a plate having been been divided and developed with identical results.

Mr. COWAN asked if Mr. Edwards had not partly developed and then intensified? If so, the results could not be compared with those shown by Mr. Watkins.

Mr. Mackie referred to a series of experiments he had made some time ago, the results of which did not confirm the remarks of Mr. Watkins.

Mr. WATKINS said that both Mr. Mackie and Mr. Edwards had compared the wrong end of the scale. They had endeavoured to compare where there was no possibility of doing so.

Mr. COWAN said that both Mr. Epwards and Mr. Mackie were counting on clear glass. If there was perfectly clear glass, then there could have been no exposure. He pointed out that Mr. Watkins's plates had been exposed, as was shown by the results. There was no sign of fog, and it was clearly not a case of discolouration of the gelatine by developer alone.

The outcome of the discussion was a difference of opinion between Mr. Watkins and Mr. Edwards.

Mr. EDWARDS said he would accept the suggestion made, and would read a paper and show specimens to illustrate his argument on March 6 next.

Mr. Bedding introduced a well-known photographer, Mr. W. H. Jackson, of Denver, who was warmly greeted.

Brixton and Clapham Camera Club.—October 16.—The members of the above Club met for the first time at their new headquarters, Brixton Hall, Acre-lane, S.W., when Mr. C. F. ARCHER gave an interesting demonstration upon the *Carbon Process*. Photographers residing in the locality are invited to attend the meetings of the Club, which will be held every Tuesday evening throughout the winter. A special feature is the formation of instruction classes. Full particulars may be obtained from the Hon. Secretary, Mr. F. W. Levett, 11, Corrance-road, S.W.

Croydon Camera Club.—The meeting on the 24th was devoted to lantern slides shown by the oxyhydrogen lantern, and included views by Messrs. Lock, Bowen, Hirst, Corden, Noaks, jun., Jenkins, Isaac, and J. Smith. From these a selection was made for the forthcoming public display at the Braithwaite Hall. Mr. W. Page was elected a member.

Ealing Photographic Society.—October 25, Mr. H. W. Peal in the chair.—Mr. W. Bradney and Mr. J. Newns were elected members of the Society, and five new members were proposed. Mr. B. E. Peal then gave a paper on *Cold-bath Platinum*, advocating its use, as it is a very quick process, both in

printing and in the subsequent operations, and at the same time having the merit of permanency. To print in the ordinary way, this paper is about three times as rapid as the ordinary albumenised paper. There are two ways of developing this paper, either by floating on a solution of oxalate of potash, or by brushing over the exposed parts with a solution of oxalate and glycerine. Mr. Peal strongly advocated the use of the latter method, as it allows of much more control over the development, and also gives considerable opportunity for local development. Under-printed prints may often be saved by using a hot bath, and heat may also be used for local development. The cost compares very favourably with that of printing-out papers (silver), for, although the platinum paper is dearer in the first instance, no expensive toning baths are needed, and the results are undoubtedly more artistic. The meeting then adjourned to the dark room, where Mr. Peal gave a very interesting demonstration, showing how the different methods he advocated were carried out. Mr. H. W. PEAL then gave a lecture and demonstration on the *Borax Toning Bath*, advocating its use as being cheap, and giving excellent results if used with moderate care and at a temperature of not less than 60° to 70°. Samples of Austin Edwards's "Queen" films and plates were distributed.

Leytonstone Camera Club.—On Wednesday last the members of this Club met to hear a lecture by Mr. W. H. BARNES (of Messrs. Edwards & Co.) on *Isochromatic Plates and How to Use Them*. Mr. Barnes started by expressing the opinion that he thought most of the members knew the value of isochromatic plates, as Messrs. Edwards had for seven or eight years been endeavouring to spread a knowledge of the subject among photographers. In examining the spectrum, more light is found in the region of the yellow, and less in the blue. The result, in photographing these colours on an ordinary plate, is that the yellow photographs too dark and the blue too light. A transparency was then made from a negative composed of various coloured gelatines, and the result, on an ordinary plate, showed that, while the yellow hardly printed at all, the blue printed almost as dark as through clear glass, the result, on an isochromatic plate, giving, as near as could be judged, correct colour values, the yellow showing lighter than the blue. Various photographs were then handed round, showing the superiority of isochromatic plates for landscape work, the pictures on these plates giving the clouds in cases where, on an ordinary plate, no clouds were visible. In conclusion, the lecturer advised the use of isochromatic plates in landscape, to obtain the clouds and distance correctly, also to get over the difficulties of haze and fogs; in flower-copying, to obtain the necessary colour values; in portraiture, to get rid of freckles and to minimise retouching; in photo-micrographic work; in copying oil paintings, for which it is recommended to use a yellow screen. Isochromatic plates would do all that ordinary plates could do under any conditions, and, under most conditions, a great deal more, as the worker has not only the added power of the plate, but has the advantage of being able to use a yellow screen, which, for some work, is absolutely necessary; and, in the lecturer's opinion, these plates would in time entirely supersede those of ordinary manufacture.

Northern Photographic and Scientific Association.—The usual fortnightly meeting of the above was held on Thursday, the 18th inst. A paper, illustrated by living microscopic specimens, was given by Mr. NEWSTEAD, who dealt chiefly with the subjects of the lower forms of animal life. The paper was of great interest, and was followed with close attention by the members present, by whom it was greatly appreciated. Towards the close of the evening, a short discussion followed upon the subject of burnishing photographic prints, arising out of a specimen burnisher, brought by one of the members. The next meeting will be held on Thursday, November 1. Headquarters, offices of Mr. Muskett, No. 1, High-street, Wood Green.

North Middlesex Photographic Society.—October 22.—The results of the experiments with the Lumière plates which were distributed some time back were shown. They had been exposed upon groups of flowers, pictures of various predominating colours, coloured diagrams such as used by artists' colourmen, a representation of the colours of the spectrum, &c. The A series of plates were found to be somewhat more sensitive to yellow and green than ordinary plates, but red appears not to affect them, and is rendered as black while the plates of the B series are slightly sensitive to red but do not appear to be more sensitive to other colours than the ordinary plates. A lively discussion took place, and some surprise was manifested that the difference in the results between the colour-sensitive and ordinary plates was not more marked than appeared to be the case. Questions were asked as to whether there was any real advantage in using isochromatic plates for general landscape as distinguished from special work, the answer being decidedly in the affirmative.

Richmond Camera Club.—The Annual General Meeting was held on Monday, the 15th inst., Mr. Cembrano in the chair. A satisfactory report and balance-sheet was submitted, and the following officers were elected for 1894–5:—*President:* Mr. F. P. Cembrano, jun.—*Vice-Presidents:* Messrs. P. Ennis and E. D. Purcell.—*Committee:* Messrs. G. Ardaseer (Librarian), J. H. Alabaster (Lanternist), J. D. Gibson, F. Neville, and J. H. Williams.—*Hon. Treasurer:* Mr. J. B. Huddy, 15, Lancaster-park, Richmond.—*Hon. Secretary:* Mr. C. H. Davis, 97, Church-road, Richmond.

MEMBERS and their friends were afforded a rare treat on Monday, October 22, when Colonel Gale showed some of his beautiful lantern pictures to a large and appreciative audience. The Colonel styled his selection *Odds and Ends; Old Friends and New*. The slides shown were, for the most part, pictures of English rural scenery and studies of rural life—sheep and cattle on the south downs, ploughing scenes and harvest scenes, the country in its summer and winter garb, typical shepherds, osier-peelers, spinning women and lace-makers. Colonel Gale's description of his pictures and the circumstances under which they were taken, enlivened as it was with a touch of dry humour here and there, added much to the interest of the show.

West Surrey Photographic Society.—About ninety members and friends assembled at the Public Library, Lavender-hill, on Wednesday, the 24th inst., for the first Lantern Night of the session. Amongst the slides exhibited, Mr. Paul Martin's views of Yarmouth and scenes of London street life, Mr. Joy's Corfe Castle, and Mr. Bond's interiors of Exeter Cathedral met with well-merited approval. In consequence of the ill-health of the Hon. Secretary, Mr. Seward, Mr. C. E. White was appointed to act as Secretary *pro tem.*

Woolwich Photographic Society.—October 25, the President (Rev. S. E. Chettol, M.A.) occupied the chair.—The preliminary business, included the election of three new members; also the HON. SECRETARY at some length gave an account of the arrangements of the forthcoming *Conversazione* and Exhibition of members' work. The Chairman then introduced the representatives of the Autocopyist Company, who proceeded to give a demonstration with the Photo-autocopyist, which proved very interesting to the large number of members present. The usefulness of this simple apparatus was made apparent, not only to photographers, but to tradespeople and others who require a ready means of reproducing prints. The apparatus is also very useful to secretaries requiring a large number of circulars. Mr. BARKER, who has had some experience of the working of the process, moved a vote of thanks to the demonstrators, which was seconded by Mr. DAWSON and cordially agreed to.

Birmingham Photographic Society.—There was a large audience assembled at the Young Men's Christian Association Room, Needless-alley, on the 16th inst., to hear a lecture by F. W. W. Howell, Esq., entitled *Ice-axe and Camera in Southern Iceland*, which was illustrated by over seventy slides from negatives taken by the lecturer by means of a quarter-plate camera. Mr. Howell has all the good qualities of a successful lecturer, possessing a happy facility of expression, with an unusual lucidity of description. He gave a graphic account of his experiences upon his various journeys and explorations in that wonderful island of almost insurmountable peaks, snow fields, glaciers, volcanoes, larva beds, boiling springs, and peculiar geological formations. He also described the arduous difficulties of travel and mountaineering there, and dealt with the characteristics of the inhabitants and their modes of living, relating instances of their hospitality and industry, and personal anecdotes connected with his stay amongst them, which kept his audience in close attention during the whole of his address. The slides, which had been judiciously selected to enhance the lecturer's descriptions, were of excellent quality, and added much to the enjoyment of the audience, the occasion being considered one of the most successful of the Society's meetings during the present year.

Leicester and Leicestershire Photographic Society.—A meeting of the above Society was held on Wednesday last in the Society's rooms, Mayor's Parlour, Old Town Hall, the President (Mr. J. Porritt) in the chair. Two members were proposed for ballot at next meeting. After the minutes the PRESIDENT referred in sympathetic terms to the painfully sudden death of Mr. Thomas Scotton, of Derby, who was an honorary member of the Society. In the course of his remarks he mentioned how willingly Mr. Scotton always assisted the Society with his advice and demonstrations, and reminded the meeting that, by such a removal, the photographic section of the district was distinctly poorer. On the motion of the President, seconded by Mr. Tom, the Secretary was desired to forward a vote of condolence to the widow and family. The *Tit Bits* slides, *Popular Authors and their Work*, were then passed through the lantern by Mr. Hubbard, and were much enjoyed by a full company of members and lady friends.

Leigh Photographic Society.—October 25, Mr. Burrows presided.—The developing demonstration was unavoidably postponed until the next meeting. The prints sent in for the landscape competition were judged and awarded as follows:—1st. Prize, *View of Pandy Mill* (on Whatman's home-sensitised drawing-paper), Mr. Tom Haddock; 2nd, *View near Llanberis* (platinotype), Mr. W. Hampson; 3rd, *Welsh View* (platinotype). There was a good attendance, and great interest is being taken in these competitions.

Liverpool Amateur Photographic Association.—October 25, Mr. Alfred Tyrer in the chair.—The following gentlemen were duly elected members:—Messrs. J. W. Hayward, M.D., H. R. Oakey, L. Morgan, M.B., Reginald Cookson, and F. J. Hartley. Messrs. Benjamin Cookson and E. H. Roose were elected auditors. A sample from Taylor, Taylor, & Hobson's, of Leicester, showing improvements in lens fittings, was on view. Mr. T. E. C. WILSON gave a very able and lucid description of a cheap "home-made" enlarging camera, constructed by himself. Each part was fully explained, and afterwards an enlargement was made from a quarter-plate to whole-plate, which gave entire satisfaction to the audience. He also showed a very simple method of using one's own camera for reduction of any size negative to lantern slides.

Midland Camera Club.—Mr. H. R. Leech (President), in the chair. Mr. Fowler showed a Barnet lantern plate that he had exposed for six minutes with a view of getting red tones, owing to the prolonged exposure he had got reversal of the image. Mr. Bailey brought several slides which were used for teaching science in the Board schools. The President, since their last meeting, had visited both exhibitions in London, and was pleased with the position of Dr. Hall Edwards's pictures at the parent society, after alluding to a practical joke which had been played on the *Linked Ring*, and the "picture" accepted and hung, particulars of its manufacture were promised at a future meeting. With reference to the collecting of photographs of Birmingham Life, Mr. Harold Baker had promised prints including his clever snap-shot of the Duke and Duchess of York, Mr. Welford his unique collection of Birmingham street Scenes, Councillor Martineau, a rare photograph of the birthplace of David Cox, and Mr. Bailey informed the meeting that Mr. Jerome Harrison had kindly promised his invaluable assistance.

Newcastle-on-Tyne and Northern Counties Photographic Association.—The Annual Meeting was held on the 23rd inst., Mr. M. Auty (Vice-President) in the chair.—The Secretary's report showed the Association to be in a prosperous condition, and the Treasurer reported a balance in hand. The election of officers took place, and resulted as follows:—*President:* Mr. J. Pattison Gibson.—*Vice-Presidents:* Messrs. M. Auty, W. Parry, J. S. B.

Bell, and J. H. Robinson.—*Council:* Messrs. W. E. Cowan, J. E. Goold, George Hall, J. J. Kirkwood, Edgar G. Lee, T. O. Mawson, G. L. Snowball, John Watson, L. Williamson, and Captain Sayers.—*Treasurer:* Mr. Frederick Park.—*Secretary:* M. James Brown.—*Assistant Secretary:* Mr. Parker Brewis. Eleven new members were elected.

Widnes Photographic Society.—October 10, Mr. V. C. Driffield (President) in the chair.—Mr. RAE read a paper entitled, *A Rambling Talk about Matters Photographic*, in which he compared the merits of different varieties of hand cameras, afterwards exhibiting a series of lantern slides illustrative of a tour in Scotland, and prepared on a variety of plates, including Mawson's (some of which had been intensified) Alpha plates, toned and untoned, and Hill Norris's collodion plates.

OCTOBER 24.—Mr. G. J. Warner in the chair.—The PRESIDENT (Mr. V. C. Driffield) read a paper entitled, *The Principles Involved in Enlarging*, with a practical demonstration. This will appear in a future number. During the evening several enlargements were passed round for inspection, and the difference in quality between an enlargement from a negative, the density range of which was outside the limit of the paper, and the reproduced negative, whose density range fell within the limit, was truly astonishing, the former giving an offensively hard, and the latter a beautifully soft, picture, full of delicate half-tones and detail. Negatives prepared for contact printing, and their corresponding reproduced negatives for enlarging were also passed round, the former being good, plucky negatives capable of producing brilliant prints, as inspection of these evidenced, whilst the latter were, apparently, hopelessly thin, and useless for any purpose whatever.

Photographic Society of Ireland.—October 12.—The PRESIDENT (Dr. Scott) delivered his address, in which, after dealing at some length on the progress of the Society and the success of the Dublin Convention, reference was made to Dr. Joly's recent discovery in the direction of colour photography (an example was exhibited on the screen), and of which, no doubt, more will be heard later on. After the address, Messrs. Hargrave and Ruthven officiated at the lantern, and passed through a number of beautiful slides, kindly lent by Mr. Brier, of Macclesfield, as well as several fine specimens of seaside pictures taken by Mr. A. M. Geddis.

OCTOBER 25, Mr. Alfred Werner (Vice-President) in the chair.—An address on *Stereoscopic Photography* was delivered by Mr. J. H. WOODWORTH. The lecturer, who is an expert in this branch of photography, introduced the subject in his usual clear, lucid, and concise style, and, after referring to the work of Wheatstone towards the development of the stereoscope, and the invention of the present instrument in use, in 1849, by Sir David Brewster, Mr. Woodworth went on to say that, in the earlier days of photography, the stereoscope was a very popular instrument, but that of late years it had been practically ignored and fallen into disuse. The cause of this, in his opinion, was due to the careless and faulty mounting of slides as well as to the defective instruments produced for sale. He thought that stereoscopic work, which is the only method in photography by which nature, in its true solidity, as seen by the eye, is shown, was once more taking the field, and was being very successfully carried on everywhere by enthusiasts. He thought it had reappeared this time to remain. Mr. Woodworth mentioned that it was possible to see stereoscopically without the use of an instrument by closing one eye while examining a picture. This, he said, required a little practice, but that after a while no difficulty at all was experienced when viewing a print as described. The lecturer further stated that the stereoscopic system had been applied to the microscope, and that, by the introduction of a prism, objects, even at a very low power, were stereoscopically seen, and he then showed an instrument, or adapter, lent by Messrs. Curtis Brothers, for use with an ordinary lens camera in taking stereoscopic pictures, which is simple in the extreme; but he preferred, for the best results, to use a camera made for the purpose, and fitted with two lenses. After referring to the fact of producing binocular pictures on the lantern sheet, and giving various hints, suggestions, and particulars about transferring and mounting pictures, the lecturer terminated a discourse which proved of the greatest interest to those who listened, and which evoked a lengthened discussion, in which Messrs. L. R. Strangways, R. M. Inglis, A. M. Geddis, and P. C. Curtis took part. Several new members were elected.

FORTHCOMING EXHIBITIONS.

1894.		
November	2, 3	*Photographic Salon. Alfred Maskell, Hon. Secretary.
,,	2–14.....	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,,	12–17.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,,	20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,,	21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,,	29, 30 ...	Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,,	23–Dec. 1	*Stanley Show (Photographic Section).
	27–Dec. 1	*South London Photographic Society. C. H. Oakden 51, Melbourne-grove, East Dulwich, S.E.
,,	29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
1895.		
March	25–30	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A NEW EXPERIENCE.

To the EDITOR.

SIR,—Recently we collected all our waste—washings, cuttings, &c.—arising from the consumption of two years' use of P.O.P., forty reams, sending the waste to a local refiner's. The astounding information was told us there was so little silver in the twelve pounds assayed to scarcely pay working expenses. Not feeling at all satisfied, the bulk of waste was sent to a well-known London refiner, whose statement was so unsatisfactory that he waited instructions to boil up the bulk or return ash to us. The final result brought me a cheque for 3*l.* 2*s.* 6*d.* The question arises, Is the P.O.P. waste worth saving after two years' trouble in storing up all refuse? I think not. During the days of silver printing we generally realised 30*l.* a year from the silver waste, but here, in the chloride waste, we get fairly no return. It would be interesting and instructive, after what has been written in the journals on this question of saving wastes, to have the experience of other photographers, not photographic writers, if they have realised any such returns as above. MORA.

Brighton.

GLYCIN-HAUFF FOR DEVELOPMENT OF WET-COLLODION PLATES.

To the EDITOR.

SIR,—It is not generally known that glycin is a very good developer for wet-collodion plates, and we give you below the formula, which may be of interest to your readers, and if you can find space to publish same in your valuable JOURNAL we shall feel obliged.

Make the following solution for stock:—

Pure sulphite of sodium crystal	2	ounces.
Dissolved in		
Warm water .....(fluid)	4	,,
Add thereto		
Glycin	¾	ounce.
Carbonate of potassium.....	4	ounces.

(This latter must be added by degrees, on account of the carbonic acid which is liberated.)

This makes a thin, pasty solution, and will keep well in open vessels because the glycin-alkali is not dissolved, but is kept suspended.

For use, shake the solution, and take one part thereof, and dilute same with twelve-fifteen times the quantity of water.—We are, yours, &c.,

Philpot-lane, London, E.C., October 29, 1894. FUERST BROTHERS.

THE REJLANDER SLIDES.

To the EDITOR.

SIR,—For some months Mr. Charles H. Oakden, of the South London Photographic Society, has been endeavouring to complete a set of slides, after Rejlander, for circulation for the benefit of Mrs. Rejlander, who is in necessitous circumstances. Although we have only been able to obtain some sixty of Rejlander's subjects, we feel that we cannot wait longer if Mrs. Rejlander is to benefit this year. We therefore shall be pleased to send to any Society the set of slides, together with an address on *Rejlander* by Mr. A. H. Wall, which was read at the Royal Photographic Society when a portion of the slides were shown.

The conditions will be that the Society pays carriage on the slides, and makes a collection on the evening on which they are shown.

It may also interest your readers to know that prints 10 × 8 of all the subjects may be obtained at 1*s.* 6*d.* each.—I am, yours, &c.,

(For the Rejlander Committee) H. SNOWDEN WARD, *Hon. Sec.*

October 27, 1894.

THE BENEVOLENT.

To the EDITOR.

SIR,—We shall be greatly obliged if you will kindly draw your readers' attention to the fact that, by the kindness of the Council of the Royal Photographic Society, we are to have a "Benefit" night for the Benevolent. The date fixed is Thursday, November 8.

Further particulars will be sent you in the course of a few days.—I am, yours, &c., (*For the Committee*) H. SNOWDEN WARD, *Hon. Sec.*

October 27, 1894.

THE PROPOSED HAND CAMERA SOCIETY.

To the EDITOR.

SIR,—Your kindness in inserting my first letter has produced quite a shoal of promises to join from all parts of the country, and with them many useful suggestions and ideas that are worth thinking over. It is absolutely beyond my time to reply to all the kind letters, and I trust the writers will appreciate the situation of a busy man and accept his apologies. Judging from the letters and promises already received, there is every chance of a really big society, but even the preliminary work is going to be too much for me. I will, therefore, ask one or two London workers with a little spare time to step forward and help me.

In order to further the cause, to secure promises of membership, to work up the local papers, and by that means bringing the society before the eyes of the many workers outside the photographic societies and photographic papers, I have asked the following gentlemen to do their best for their respective districts :—J. W. Wade and S. L. Coulthurst (Manchester); R. R. Brown, C.E., and Dr. Stainthorpe (Bridlington, Saltburn, &c.); A. Brooker (Hastings); Henry Newson (Norfolk); Watson Craik (North of Scotland); Leonard Marshall, M.A. (Godalming); William H. Mayor (Plymouth); J. Kennerell (Wisbech); Harold J. Reid (Cheshire); A. G. Peck (Hull); Frank Howard (Wallingford); W. L. Fletcher (Cumberland); Arthur H. Morris (Liverpool); H. Cooper, jun. (Northampton).

I should like to get similar workers in the following towns and centres: Newcastle and Tyneside, Cardiff and South Wales, North Wales, Dublin and South of Ireland, Belfast and North of Ireland, Glasgow and Clyde district, Edinburgh, Bristol, and Bath, Birmingham and district, Torquay and South Devon, Ilfracombe and North Devon, Lincolnshire, Essex, Sheffield, Leeds, and York, Nottingham and Derby, Burton and Stafford, Leicester, Kent, and other places where there is a likelihood of hand-camera workers. The question is now, where they are not.

Some of the ideas set forth in the various letters are as follows :—"There is a feeling that the Londoners will reap all, or a greater part, of the benefits, and the provincials left out in the cold; to get over that difficulty, the Club will have to be carried on somewhat on the lines of a postal club, but, instead of individual members, district centres will have to be formed, preferably in connexion with existing societies, they having generally better means of obtaining meeting rooms, &c." . . . . "Each town contributing members should have a local secretary, making each town a branch—'Bridlington Branch Hand Camera Club'—a general secretary and officers at the head quarters. Albums should be sent to local secretaries, who should be responsible for them. A night or nights, to be decided by the local secretary, who sends out notices of meeting when albums may be inspected; local secretary will then forward to next local secretary, in accordance with instructions from general secretary. Branch club work could then be, done, and prizes given for club excursion work. Each town would then be as it were, a club in itself, but at the same time under the control of the central administration. Lantern slides should form an item, and in each town one member will surely possess a lantern. Lantern nights could be given and slides passed on. Enlargements might also be encouraged. I think that, before pictures are criticised by experts, members should be asked to criticise a set of prints in a book kept for the purpose. The expert's criticism should then be published and sent round for the local secretaries to read at a meeting duly convened. This would be a very valuable lesson, as it would show how far each member was capable of pulling a picture to pieces and finding its weak points, which is an art in itself." . . . . "Subscription, 10*s.* 6*d.* to county members outside the London postal district; 1*l.* 1*s.* to London members and country Fellows. London Fellows also to pay 1*l.* 1*s.*, as they are likely to make up for their proportionately smaller subscription by valuable and voluntary services rendered. Then, again, I think you might appoint in favourite resorts local secretaries or agents (the former title preferably), who would give information, take charge of cameras, offer dark-room accommodation, and last, but not least, act as local press reporters for the *organ* of the proposed society." . . . . "I have several amateur friends here who would only be too glad to form a local branch, and my idea of local branches is that friends will be able to join in club work. Each local branch will try to vie with its near neighbours, and a healthy rivalry will be instilled into club work that would perhaps be lacking if it were simply individuals in towns being individual members of a national club. Friends would be brought together out of doors with the magic box, indoors with the lantern; papers might be read, and many a dull hour enlivened by congenial society. Funds would be common to the National Camera Club, and each local secretary would have to produce references and account for all moneys and expenses to the central administration. There is no limit to what such a club might do. It might one day have its own organ, *The National Hand Camera Club Journal*, and be on a par with the Royal Photographic Society. However, it will take time to reach these flights of fancy. But he who aims at the sky shoots higher than he who aims at a tree." . . . . "I would prefer to have permanent headquarters, something after the Camera Club style, only I suppose you would have to make a modest beginning. There being so many men keen on snap-shots, &c., with a hand camera nowadays, a good club ought to be as easy as a poor one."

What I want for the present are names of those likely to join, as requested in my first letter to you (dated October 12). It is evident that absolute agreement with the various ideas set forth is quite unnecessary for the present. If I can get provisional promises to the extent of 200 to 300 members, then we can make a definite start during the winter, in readiness for next year. Therefore I ask *every one* willing to join the Society to send me his or her name and address, if only on a postcard. If they can find time to spread themselves out into a letter, with ideas and suggestions, so much the better. WALTER D. WELFORD.

59 *and* 60, *Chancery-lane, W.C.*

DR. ALBERTS' PROCESS.

To the EDITOR.

SIR,—The information given by Mr. Gamble on p. 639 may be supplemented by references to the *Journal of the Franklin Institute*, May, 1888, p. 354, lines 14 to 18, and the *Journal of the Camera Club*, April, 1894, p. 65, 3rd and 4th paragraphs. These references show that I was the originator of the idea which Dr. Albert has patented, and that I was also the first to explain the philosophy of the method. As long ago as in 1886, I used a square opening instead of a round one, in connexion with crossed-line screens, and have since taught this method and improvements upon it to not less than thirty operators in this country and in England. The application of this idea in connexion with sealed ruled cross-line screens, both of which I invented in 1886, constitutes the so-called "American method," which has now superseded the "Meisenbach" process, even in Europe.—I am, yours, &c., FRED. E. IVES.

Philadelphia, October 18, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange square half-plate box body camera, with winch screw, also tripod, for embossing press with dies for *cartes-de-visite* and cabinets.—Address, C. G. COLLETT, 14, Mercer-street, Cable-street, E.

Will exchange five and a half centre back-geared turning lathe on wood bed and supports for cabinet portrait lens or hot rolling press.—Address, J. A. ROBINSON, 28, Bucknall Old-road, Hanley, Staffordshire.

Wanted, 12×10 camera and slides, or a wide-angle lens, in exchange for Marion's 8*l.* hot roller and Eastman's 7½×5 roll-holder, both in perfect condition.—Address, W. EMERY, 24, South-street, Baker-street, W.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

William Griffith Honey, 28, Grand-parade, Cork.—*Photograph of two Cats on roof of house.*

Richard Keene, 52, High-street, Burton-on-Trent.—*Ten photographs of Temple Newsam.*

Debenham & Co., 5, Clifford-street, York.—*Two photographs of the Rev. Canon Fleming.*

Clarke & Co., 46, Week-street, Maidstone.—*One photograph of Science and Art School, with Museum adjoining.*

LANTERNIST.—Certainly not without permission. Write to the publishers of the magazine and state what you propose to do.

NOTTS.—Send us one or two examples to see. So far as we can judge from the description, the paper has been exposed to a faint light at some time or other.

W. McG.—In all probability the solution of perchloride of iron was used in too dilute a state. The stronger it is, the slower is its action through the gelatine image.

C. BUTTERWORTH.—The trouble proceeds from attempting to dissolve vulcanised rubber. Procure some unvulcanised, preferably what is known as "masticated rubber," and there will be no difficulty in dissolving that in benzole.

M. A. H.—Some process workers prefer one class of negatives to work from and some another. Your best plan will be to write to those for whom the photographs are taken and ask them the character of pictures that suits their particular method of working best.

W. WATTS.—A fee is, we believe, charged for the privilege of photographing within St. Bartholomew's-the-Great Church. It is half-a-crown we think, and it goes towards the restoration fund. The verger, who is in constant attendance, will give all particulars.

C. O. X.—If you have no confidence in cylinders under high pressure, there is no reason why you should not use them under a low pressure—say, if ten or fifteen feet only be put into a twenty-feet cylinder. Surely, you need not be nervous under those conditions that you and your family "might be suddenly launched into eternity."

T. W. A.—The only thing to be suggested is to submit the negatives to some of the publishing firms that make Christmas and New Year's cards a speciality. It may, however, be mentioned that it will be much too late now for this year's publication. Manufacturers are already at work on what will be published for Christmas next year.

FRANCIS B. WILLIAMS.—We do not value second-hand apparatus, and we have not a price list of the maker in question, hence we are unable to say the price of the instrument when new. We can say, however, the maker is in high repute, and if you write to him he will send you a catalogue, from which you can judge the value of the lens offered you.

— BOYD (*initials indistinct.*)—The residues from the developing of dry plates are of no use. Those from the washings of prints and the fixing baths are worth saving if there are sufficient of them. But it is doubtful, at the present low price of silver, if it is worth the while of an amateur, using only a few dozen plates and a quire or two of paper a year, to trouble about the residues.

RELIABLE.—Several brands of spotting medium are in the market, all of which, we believe, answer well. We cannot give you the recipe by which they are made, as the makers have not published them. Ordinary water colour, mixed with albumen, can be used for prints that have to be burnished. Possibly that will answer your purpose. It is against our rule to recommend any particular maker's goods.

T. SYMES.—Glue or gelatine will answer very well for mounting large carbon pictures; but, if they be very large, a difficulty may be experienced, more especially in cold weather, in getting the whole of the back of the print evenly coated before the gelatine sets. For this reason starch paste is generally used when the pictures are of large dimensions, and this will probably prove best for your purpose.

W. J. R.—According to your statement, the enlarged picture was made without the sitter's sanction, a thing that should never be done, particularly from a portrait that has been rejected. We do not know of any law by which, under the circumstances, the husband can claim the forfeiture of the work, though he may restrain its public exhibition. Your best procedure is to sell it to the husband for a small sum, especially as you have used it as a specimen for a couple of years. Good specimens are easily replaced nowadays.

FOGGED (Bolton).—Several formulæ and details of working the albumen process have appeared in the ALMANACS and back volumes, and another formula will appear in the forthcoming ALMANAC. If "Fogged" cannot succeed with what has already appeared, it certainly is not the fault of what has been written. Anything further would, we imagine, be of no interest to the general body of our readers, who have to be studied, particularly now that there are other processes by which very similar results can be obtained, and with far less trouble and experience.

R. S. O.—Some rollable films would answer the purpose when the deteriorated emulsion has been removed, but not all. Some kinds that have long been made cannot be got flat when unrolled, owing to the margin becoming smaller than the middle through the evaporation of the constituents of the material. The cut sheets of celluloid are free from this defect, but probably they would be too thick. You could make thin films by pouring a good quantity of enamel collodion on a levelled glass plate, and, after it has become dry, stripping it off. Probably that would answer your purpose in the initial stage of the experiments.

DIFFUSION (Birmingham) writes: "I have frequently seen in the journals that pictures—portraits more especially—of a pleasing kind, and with good *artistic* definition, can be taken with a single lens out of a portrait lens if a stop of *f*-10 or *f*-12 be used. I have made several attempts with a lens out of a Voigtlander whole-plate lens on a 12×10 plate, but the result is chaos. Even when a *f*-16 stop is used there is nothing but extreme fuzziness to be seen."—In all probability our correspondent has been trying with the back combination. If so, this will fully account for the trouble. It is the front combination that should be used, but with the lens reversed, that is, the convex surface next the focussing screen. Then, with a stop of about *f*-10 or so, very fair definition will be obtained; indeed, the picture will then be far too sharp to please some "impressionists."

J. A. ROBINSON says: "I have recently purchased a *carte-de-visite* portrait lens engraved on mount, 'L. F. Colas, Élève-de-Lesebours, Paris.' It gives a very brilliant image on the ground glass, but the finished negative is lacking on closer examination. It seems to give a very bright circle of definition of small area, and then to dulness; also each pair of glasses, when taken out of the mount and held before a light, seem to be of the same focus, unlike another portrait lens I have, which works well. Could you give cause and cure of the above?"—Without seeing the instrument, we can give no actual opinion. Possibly the glasses have been misplaced in their cells, or the optical and visual foci do not coincide. We have in our possession an excellent portrait lens of the Petzval form, in which the back and front combinations are as nearly as possible of the same focus.

IN TROUBLE writes: "I would take it a favour if you kindly inform me, through your columns, as to the best means of making or preparing paper similar to the article that is used for backing purposes in the carbon process known, I think, as transfer paper. I am using a backing paper that I got from the Eastman Company, and they do not supply it to customers, it seems; they make it for their own works only. It is very successful, and I think the transfer would do as well. The difficulty I have in enamelling Solio is the backing a plate with a number of prints with a sheet that will strip (from the French-chalked plate) with the margin around the prints. With other arrangements, the backing is cut to size of print, which is inconvenient."—The transfer paper used in the carbon process is simply paper coated with gelatine, containing sufficient chrome alum to render it partially insoluble in warm water. The proper proportion is easily arrived at by experiment, as it varies with different samples of gelatine. If carbon transfer paper answers, it will be much cheaper to buy it than to to prepare it, as it is so very inexpensive. The Autotype Company and others supply thirty square feet for, we think, about three shillings.

CARBON (Salisbury) says: "Will you please give me a little information on the following:—1. I have some carbon tissue which I have had by me for the last four years; will the time have any effect on it? It worked all right when first obtained, but on using it the other day I found that it was insoluble. I tried two or three lots with different sensitising bath, bath used as follows: Bichromate of potash, 1 ounce; liquid ammonia, 5 minims; water, 20 ounces. I have enclosed piece of tissue unsensitised. 2. Can you tell me what is the cause of the deposit or stain on the enclosed bromides? They came during development. I have done three or four dozen; some came up all right, others as enclosed; developed with—Eikonogen, 1 ounce; sulphite of soda, 5 ounces; carbonate of potassium, 2½ ounces; water, 30 ounces; for development, 1 ounce to 3 ounces of water. 3. What book on photo-mechanical processes should a beginner get? Would Wilkinson's do?"—In reply: 1. We have kept carbon tissue much longer than four years, and found it work well. The piece enclosed arrived cemented to the prints, but we succeeded in detaching a small piece, and it proved quite soluble in warm water; hence, we can only conclude that its insolubility is brought about in the sensitising or drying, probably the latter. Try quicker drying. 2. The prints are fogged, and as only some are fogged, and others are not, the fog is due to something in the manipulation; probably too much light is allowed access to the paper at one stage or other. 3. Yes.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1801. Vol. XLI.—NOVEMBER 9, 1894.

IMPROVEMENTS IN LANTERN CONDENSERS.

The time being seasonable for the consideration of all that appertains to the optical lantern, we propose saying a few words on a topic which is of more importance than some appear to credit it with, viz., the condenser.

In other pages we have spoken of the true function of each component of the lantern condensing system, and shown that a lantern condenser is of a twofold nature—the lens next the light being a collector and paralleliser of the light, while that nearest to the slide is the condenser proper.

As regards the former of these, two things should be endeavoured to be attained. One is the placing of the lens as close to the light as is compatible with safety, the other being to do so with the minimum of spherical aberration. If the light is too near to the first surface—and we are now speaking of the well-known ordinary double condenser—there is a danger of its cracking from its thickness and the proximity of the great heat, for the thicker the lens the more liable it is to crack. Hence the greater degree of light thus obtained is got at too high a price, optically. Now, concerning the spherical aberration arising from the employment of a large and thick plano-convex lens of short focus, it need scarcely be said that is of great amount, this amount only being decreased by the reduction of the diameter of the lens, or, what comes to practically the same thing, by lengthening its focus and thereby necessitating the withdrawal of the light.

In a good collector of light the angle of illumination ought to be wide, and the transmitted rays should fall upon the condenser proper in a beam as nearly cylindrical as possible.

This, as we have long since shown, cannot be done under the most favourable conditions by the employment of a single collecting lens. It may be possible to transmit a fairly large volume of light sufficiently good for ordinary lantern-slide exhibitions, but when the lantern is to be used for photographic enlarging, in addition to ordinary projection on a screen, then does the spherical aberration of the condensers assert itself by inferiority at the margins. Every user of a microscope is aware that the aberrations of a single plano-convex objective of anything at all approaching to a high or even moderate narrow angle are such as to preclude its being used alone, hence a second lens at least is necessary for their reduction. Much the same remedy is required in a lantern collecting system of the highest order. To minimise the aberration in a collecting lens, and also secure all the advantages arising from having the light at a large angle, two lenses instead of one only should be employed. By the judicious selection of curves a collecting system, composed of two lenses, may be made, by which a large angle of light may be grasped and transmitted to the condensing lens in front.

While the collecting lens or lenses are fixed for all purposes, not so is this the case with the condensing lens, which ought to have a relation to the focus of the objective by which the image of the picture is produced. When parallel rays fall upon the convex surface of the condensing lens, they are projected forward to a focus at a definite place; and we have always held that the focus of this condensing lens should have a relation to that of the objective, and be specially selected to meet the end in view. Here are two objectives, one of short focus, say five or six inches, for covering a screen placed at only a short distance away. Now, the focus of the condenser should be such as to bring all the parallel rays that fall upon it from behind to a focus as near to the front lens of the objective as possible. But change the conditions, and, instead of a few feet intervening between the lantern and the screen, let there be the entire length of a long hall, and what changes are needed? In the first place, an objective of twice, or more than twice, the focus of the previous one must be selected, else will the disc on the screen be too large. But, if the condenser brought the rays to a point at only six inches from it, it follows that it would be altogether wrong with a twelve-inch lens, which would require a condenser to work in harmony; and to do the same thing with the light as it did in the previous instance with the objective of short focus, such curves must be selected for it as will bring the rays to an apex at the front lens of the twelve-inch objective. A make-shift is commonly had recourse to by withdrawing the light from the condensers in the case of a short-focus objective, and pushing it nearer to them when the objective is of long focus. But this cannot possibly answer as well as if the condensing lens itself were so computed as to effect the end properly.

We are much pleased to find that this is now beginning to be realised by at least one maker of lanterns for scientific projection, W. I. Chadwick, of Manchester—who employs two collecting lenses in his triple condenser, these being permanent in the front of the lantern, and at a definite distance from the light so as to project forward a cylindrical beam of light suitable for polarisation or similar purposes; and also any one of three condensing lenses of different foci to suit the requirements of the different front lenses which may have to be employed. Thus

if the screen is only at a small distance from the lantern, the focus of the objective required being necessarily short, the No. 1 of the condenser trio is inserted in front without disturbing the fixed collecting lenses, and the maximum effect of the light is concentrated on the disc. If a still greater distance is to intervene, requiring an objective three or four inches longer in focus to produce a disc of the same size at an increased distance, then is that condenser lens marked No. 2 made to take the place of No. 1; while, similarly, if the lantern must be placed at the back of a hall so as to shoot the light over the heads of the people, demanding, of course, a still longer focus objective, then does the insertion of the No. 3 condensing lens ensure the projection of the picture with the same luminousness, less the light absorbed by a possibly smoke-laden atmosphere, as that obtained when the lantern was closer to the screen. Certain markings on these interchangeable condensing lenses are such as to enable any one of them to be placed *in situ* almost in the dark.

Another thing we notice in Chadwick's new condensers is the increase of their diameter from four inches to four and a half. This also is an improvement, as serving not to cut off the corners of the slides when projected on the disc, which is the case with many of those of only four inches, especially if they are inserted in the lantern so as to be half an inch or more from the surface of the condenser.

The meniscus front of the collecting pair is four inches in diameter, and is protected from the heat by a thin plain glass, and these, together with all the others, are set loosely in their mounts so as to allow for expansion by heat. The angle of light included is very large.

DARK-ROOM ILLUMINATION.

So much of a very misleading nature has been, and continues to be, written on this subject that it will be advantageous to look upon it from a point of view embracing the principles that should underlie the construction of lamps or other means for lighting the very inner chamber of the process. It may be said that there are four distinct and separate purposes for which the light is needed, each apart from, though connected with, the other. Firstly, light is required for a general illumination of the room, to see one's way about, as it were; secondly, for the illumination of one particular region, that is, where the plates are inserted into, and withdrawn, when exposed, from the dark slides; thirdly, it is necessary to have a certain amount of light thrown upon the plates during the time, or a portion of it, that they are acted upon by the developer; fourthly, to ascertain the character and density of the developed image, a light of a certain amount of brilliancy is needed at intervals, that the negative may be held in front of it for a brief period. As for each of these four purposes the plate is acted upon by the light for different periods of time, it is self-evident that, unless its acting intensity is averaged by placing the plate at different distances according to the length of time it will be exposed, it is idle talk to speak of a "safe light," unless the whole room is in such a state of darkness as to make working in it a misery.

Naturally the initial tendency in operating is to use daylight, suitably filtered with a coloured screen. And here comes the crux, What colour should that screen be? We do not intend to lay down any hard-and-fast line. Every one should, from personal experiments, assure himself of the safety of his light filter by simply exposing to its influence a new unexposed plate, and allowing it to remain exposed for the maximum time it will in all probability ever be exposed. This time wi vary, as a matter of course, according to the position, so tha if dark slides, for example, might safely be changed and u changed in a certain part of the room, the exposure being onl a matter of a few seconds, it might be that the same pla would be quite unsafe to place the developing dish in unless were covered most of the time. But, developing during da light, the worker will most probably like to have his developin dishes near to the window, so as to be able to raise his plate t look through it at intervals. Then either the light must b dim or else the plate must be so screened or placed as t receive but a small portion of the illumination needed in th previous instance. Then the plate-changing may be carrie on in almost any part of the room, as the few seconds they ar exposed will not be enough to do the slightest injury unles the light be abnormally brilliant.

Thus far as to daylight; but, as the intensity of the illumi nation so obtained may vary tenfold from one time to another it needs no argument to show that to be safe it must be screened down to what is safe at the brightest, and thus, at other times, there would be nothing but obscurity made visible. It is therefore obvious that artificial lighting of the dark room will permit far more comfort, at all times, than daylight, for it can be used always at maximum strength, and, when used for examining the plate by transmitted light, it will possess the further great advantage of being practically a standard light, and enable the judging of density and character to be carried on with far greater nicety. Further, it can be placed exactly where it is wanted in regard to the general planning of the work. To get the best value from the light, we believe the general opinion of those who develop many plates would be that there should be one light specially for this purpose, and at least one other for more general illumination, and this latter could be so placed as to give light and safety in each spot, according to the work done there.

We would here point out that many workers subject themselves to grave risks to their eyesight by developing while the light that illuminates the plates in their dishes is immediately before their eyes. This is objectionable in a double sense—first, from the danger to the eyes; and, secondly, from the retinal glare diminishing the delicacy of perspective of any object — a negative for example — that it is desired to scrutinise. All lights in front of the face should be so screened as to be shaded from the eye while falling unchecked (of proper strength, of course) upon the developing. There are many ways of doing this; to speak of it is almost to point out the remedy. We know one photographer whose light is rather low down, and he screens by the simple plan of placing his chemical shelf just the right height to act as a screen of this kind.

Finally we must, however, say that, when artificial light is used, especially in the case of gas, means ought to be devised to get rid of the unhealthy fumes of the products of consumption, which would be particularly injurious when the operator was at this work for a long time at once. We trust that, in thus epitomising on broad lines the principles that should guide in arranging the dark-room illumination, we may dispel the still strongly held belief in a "safe light."

PLATINUM TONING MODIFIED.

A COMMUNICATION in another column by Mr. W. B. Bolton on the subject of *New Developments in Platinum Toning* will be read with interest by many of our subscribers who employ gelatino-

hloride paper, and we need make no excuse in supplementing ur article of last week by a description of our trial of one of he modifications of the ordinary process given by the writer.

The modification in question is very simple in itself, consisting as it does of the substitution of an alkaline bromide or the chloride of sodium, now generally employed, either in conjunction with the salt of platinum or as a preliminary application to the prints before they are transferred to the toning bath, though its practical effect is very considerable in rendering the toning action more regular, and bringing it under greater control as regards the range of colours obtainable. What the precise function of the bromide may be, it is impossible at this early stage of our experience with it to say, for its function is not so clear as in the analogous case of its application in conjunction with the development of partially exposed printing-out paper. There its action is simply to convert the too easily reducible chloride of silver into the more refractory bromide, and to preserve the purity of the unexposed portions of the paper during the process of development; but probably the relative affinities of bromine and chlorine for silver and platinum respectively must be looked to as the explanation of the result under the new conditions.

The paper with which our trials were made was one of the principal commercial brands of the now popular gelatino-chloride paper, and the prints had been made rather for gold toning than platinum, that is to say, the printing had not been carried to any material extent beyond the depth finally required. It is generally accepted that a greater reduction of the vigour of silver prints occurs when platinum is used as the toning agent than is the case with gold, though this is by no means true of some of the most modern formulæ for the former style of bath. At any rate, only one or two of the prints our trials were made upon were what would in any way be considered deeply printed, while some would most probably have been considered decidedly under-printed, yet in no case did the final results show any loss of even the finest details.

The prints, after washing in a couple of changes of water for three or four minutes, were immersed in a four per cent. solution of bromide of potassium, the same strength, in fact, that we are accustomed to employ in the development of the same kind of paper. In this solution they acquired the well-known yellow colour, and assumed the appearance of being very decidedly under-printed; indeed, at this point we were very doubtful as to the possibility of success attending the toning without at least some reinforcement by development. They were, however, rinsed in two changes of water, and passed into the toning bath in the usual way.

The bath consisted of one grain of chloro-platinite of potassium and six grains of oxalic acid in ten ounces of water. The chloro-platinite is kept in stock solution of the strength of one grain to the drachm, acidulated with two or three minims of nitric acid to the fifteen-grain tube, so that the actual quantity of acid in the toning bath would be slightly in excess of that added at the time of use. The bath was made up only a few minutes before the prints were passed into it, as there does not appear to be any necessity to keep it any length of time before use, as in the case of gold.

In this bath the prints underwent no change, apparently, for some time, unless it was to acquire during the first five minutes an even paler yellow colour, the finer gradations of the flesh and high lights having quite disappeared, or, at any rate, become invisible to the unaided eye in the light in which we were working. At the end of ten minutes, however, a palpable change had commenced, and the deepest portions began to assume a cinnamon brown shade, and the half-tones to acquire a vigour they had not previously possessed since their passage through the bromide solution. From this point onwards the colour continued to change slowly, but regularly, and the prints to gradually increase in vigour as the pale yellow and almost invisible half-tones slowly took on the platinum. This was especially noticeable in the flesh and high lights, which appeared as if they were actually under the action of a developer, though the effect was really due to the alteration of the feeble colour to one more striking to the eye.

The range of tones through which the image passed was quite as extended, if not more so, than would have been the case with gold, though in character the colours were altogether different, going from cinnamon, through sepia and chocolate, to deep red brown, and, finally, brownish or reddish black, without at any stage showing the slightest tendency to either blue or grey, even in the lightest shades. In fact, the impression given was that it would be impossible to tone to any colour of the nature of purple or black. The last print was taken out of the bath exactly an hour after commencing toning, had then for some time remained practically stationary. It had then reached, by reflected light, a very deep brown or warm black, with a more decided tinge of red by transmitted light. Others, removed at earlier stages, showed, by reflected light, various shades of sepia and chocolate and purple brown, but nothing of the nature of what is usually known as *photographic* purple.

After rinsing in clean water, they were then immersed for a minute or two in water in which a small crystal of washing soda had been dissolved, and from this they were transferred, without further washing, to the fixing bath, consisting of a plain solution of hypo of the ordinary strength of three ounces to the pint. Here they changed colour so slightly, that in order to detect any alteration it was necessary to take a print that had been only partially immersed in the solution into a good light, when a very faint reddening was noticeable both by reflected and transmitted light, and, after a quarter of an hour's immersion, the tone was apparently as when the prints left the platinum solution.

The most remarkable feature, however, is that, although the print "on the light side," to commence with, neither in the toning nor in the fixing bath, was there any perceptible loss of detail, indeed, the worst prints of all at the finish were those which were most deeply printed to commence with, and which had not suffered sufficient reduction to render them passable, though in mere tone they were all right. This point is of some importance, since it not only shortens the time of printing, but, what is of higher value, it renders it less difficult to judge when the printing is complete.

After washing and drying, the tones, one and all, became a little cooler, warm purple and purple brown being the rule, the last print of all being a deep warm black, resembling, but for the gloss, an average platinotype or good-quality developed bromide. In effect, the tones were of a better class than would have been obtained under similar circumstances of varying periods of toning with gold, and altogether different in character from the colours we are accustomed to connect with platinum.

The somewhat protracted time occupied in toning may possibly be due to the use of an over-strong bromide bath, but certainly not to the platinum solution being exhausted, as another print put through without treatment with bromide

toned readily in a little over a quarter of an hour. If the slow toning be objectionable, it may, doubtless, be hastened, without consuming more platinum, by using a more concentrated bath, or possibly by modifying the strength of the bromide solution, or by combining the bromide with the platinum, as suggested in the article on another page.

However that may be, the substitution of an alkaline bromide for chloride in the way mentioned is worth the trial of every gelatino-bromide worker.

A Limelight Explosion.—According to a daily contemporary, a limelight explosion took place one night last week at Mason College, Birmingham. A lecture to a class of students in the biological theatre was concluding, and the assistant in charge of the lantern apparatus was removing the weights on the gas bags, when, the two gases getting in some way mixed, a violent explosion occurred, badly injuring two of the students, damaging a number of the fittings of the theatre, and breaking all the windows.

Wanted, A Name.—A correspondent in the Midlands, anent his visit to the Salon, sends us a very facetious letter, expressing his ideas on some of the work exhibited; but it is a little too personal for insertion. However, we will give an extract. He says: "When, some time ago, photographs that were taken with lenses possessing a good deal of spherical aberration and a large stop were admitted to be good, such pictures were said to possess 'pictorial definition.' As the so-called impressionism increased, and the definition in the pictures became more degraded, the term 'fuzzitype' was generally accepted as the distinctive title of such works, but I fancy it would be a libel on that name to apply it to some of the work in the Salon. We want another and distinctive name for it. What shall it be? May I suggest 'smutchograph' as being appropriate?"

Residues from Gelatino-chloride Paper.—The letter in our last issue, signed "Mora," raises a somewhat important question amongst professional photographers, namely, whether the wastes from gelatine papers are really worth saving. A little over three pounds certainly seems a small return for twelve pounds in weight of the residues of forty reams of the paper. It must, however, be borne in mind, as we pointed out a short time back, that the gelatine papers are "enamelled" with sulphate of baryta, a very heavy material, and this adds very considerably to the weight of the ashes. With the residue from albumen paper there is nothing but the ash from the paper itself, and the albumen, which is very light, and the silver. Consequently, weight for weight, the ashes from the latter must always be much richer in silver than those from the former. We shall be very pleased to have the experience of some of our professional friends with regard to the returns they have had for their gelatino-chloride residues, for that quoted certainly seems small.

Photography on the Battlefield.—The conflicting accounts of the results of the different battles in the far East naturally leads one to regret that the camera is not brought more into use, as then photographic evidence would often be indisputable. At present a difficulty might be experienced in obtaining photographs of an actual engagement on account of the smoke from the guns; but we read that the Austrian Government have now adopted a smokeless powder for their artillery, and we believe other countries are likely to do the same. With the absence of smoke there would be no difficulty in obtaining pictures while the war was raging, and a tele-photo lens would enable the operator to do so at a safe distance. Photography was first employed on the battlefield by the late Mr. Roger Fenton during the Crimean War, and under difficulties that do not obtain in these days of dry plates. The negatives, if we remember rightly, were fifteen by twelve, and were excellent, notwithstanding the difficulties under which they were produced.

Pouncy's Carbon Process Redivivus.—During the past year or two many of our readers have, doubtless, heard of a carbon process which requires no transfers; or, in other words, the image, according to the method, is developed on the paper upon which it is printed instead of being transferred to another for the purpose. The paper is an article of commerce, we believe, in France, and it seems to be prepared precisely in the same way as was described by the late Mr. Pouncy five-and-thirty years ago, and previously by Beauregard, and Salmon and Garnier. With the process, fairly presentable results were produced, but it was really of no use when first-class work was a desideratum. The results were crude and deficient, as might be surmised, in half-tone. This resuscitated process was practically demonstrated at the Salon one night last week, and those present were able to judge of its merits. The late Mr. Pouncy was at one time very proud of his process, but we imagine, if he could have been at the Salon the other night, and seen the demonstration and the results produced, he would not have been very jealous of his former bantling.

Silver Stains on Negatives.—With the approach of winter it will not be amiss to give once again a timely caution to those who print out of doors during cold weather, particularly from unvarnished negatives. We were reminded of the subject only a few days ago in the following way: Half a dozen prints were exposed out of doors one cold morning, and when done the frames were taken into a warm room and the negatives removed. The backs of them were immediately covered with condensed moisture, and, of course, a similar amount had condensed on the front, though it was not apparent, as it had been absorbed by the film. Had silver paper been put at once upon the negatives, no doubt stains would have resulted. The effect of dry paper on a damp negative is similar to that of moist paper on a dry one. If prints are exposed out of doors during cold weather, they should be changed in a room of about the same temperature as that outside, then there will be no condensation. If they are changed in a warm room, unless indeed its atmosphere is drier than is usually the case in work rooms, moisture is sure to condense on the negative, and thus prove an unsuspected cause of staining.

The Royal Photographic Society.—Among the items of the Royal Society's winter programme are the following:—November 13: *A simplified form and improved type of Photographic Lens*, by Mr. H. Dennis Taylor. November 27: An arrangement devised by Mr. C. E. Hearson for keeping developing solutions at a fixed temperature. A simple apparatus for testing the speed of shutters, with examples. Demonstrations of these will be given by by Mr. A. Pringle. December 11: *Photo-engraving with Silver Salts*, by Mr. Warnerke, who will demonstrate the process. January 8, 1895: *Standard Plates and some causes of apparent alterations in rapidity*, by Mr. John Sterry. January 22: *Control over results in Development*, by Mr. Alfred Watkins. February 12: Annual Meeting of the Society. March 12: *An unconsidered property of Photographic Lenses*, by Mr. T. R. Dallmeyer. March 26: The Evolution of Photographic Objectives, with an exhibition. It is hoped that all Members who have early or interesting examples of photographic lenses will kindly communicate with the Secretary as early as possible. Members are invited to bring objects of photographic interest to the Technical Meetings. Notice should be given to the Secretary, as early as possible, of any such matter that is likely to occupy the meeting for more than a minute or two.

NEW DEVELOPMENTS IN PLATINUM TONING.

On reading your leading article on *Platinum Toning* in last week's issue, I was reminded of some experiments made about three or four years ago with alteration of the tones of prints by redevelopment simply, or rather by bleaching and redevelopment. The idea was, in the case of prints of unsatisfactory tone or such as were partially faded, to substitute the black colour of a developed bromide print,

and to secure at least a presentable appearance if the tone were not that of the original picture.

Although I secured a certain degree of success in some instances, there was generally too strong a tendency to revert to the original colour, whatever it might have been, and especially when that colour was an unpleasing one, for the slight surface-plating of gold was insufficient to hide the defects in the redeveloped silver image. The experiments were made with various kinds of paper—albumen, Obernetter's gelatino-chloride, Alpha, all gold-toned—and also in a few cases with ordinary developed bromides. The two last, both development processes, usually gave more or less satisfactory results, but the two printing-out methods, as I have said, persistently returned to the same tone—or a worse.

On referring back to Mr. Lyonel Clark's paper, to which you make reference, which is an account of his attempts to secure *platinotype* results from *silver* prints, I was struck with the possibilities offered by his method of platinum toning combined with the redevelopment plan I had previously tried, and, though the results I have so far obtained in that direction cannot be classified as altogether successful, a brief summary of them may be interesting, and possibly put some other experimentalist on to the right tack.

Summing up Mr. Lyonel Clark's experiments, his object was by platinum toning to displace the whole of the silver in his prints and convert them practically into platinum prints; but the difficulty he had to contend with was that, when the whole of the organic silver image was removed and replaced by metallic platinum, the quantity of the latter metal it was possible to substitute was insufficient to give the depth and richness of colour sought for, unless the printing was carried to a considerable depth upon strongly salted and sensitised paper. In other words, whereas in the ordinary gold-toned silver image a considerable portion of the final picture still consists of unaltered silver organate, as he terms it, which adds very materially to the richness of colour quite independently of the actual metal present, in his method the substituted platinum has to rely solely upon its metallic value for strength and vigour; in fact, the weak point of the method was the lowering of the tone of the picture and loss of finer gradations.

Now, if, after treating the silver image in such a manner with a platinum salt as to deposit an equivalent of the latter metal upon the surface, the original silver were again reduced to the metallic state, instead of being removed by fixing, or if it were even partially done, then, instead of the reducing action spoken of, we should have in addition to the toning action of the platinum, a more or less strengthening or intensifying action from the reduction of the silver; it would, in fact, be an *addition* of platinum in place of a mere substitution.

I do not for a moment suppose that an image produced in this manner would possess the absolute permanence of a real platinotype print; but, bearing in view the difference in that respect between developed silver, as met with in negatives and bromide prints and that produced by the mere reducing action of light, it is reasonable to believe that it would be at least equal to any form of print-out image as regards stability; and, judging also from the near approach to platinum results that can be obtained upon silver papers by development, it is scarcely too much to expect that the tones would be as acceptable of their kind as many of the bromides and platinotypes we meet with. Such were the ideas which prompted me to take the line of experiment I have done, which want of sufficient time will, I fear, prevent my following out as fully as I could wish.

In outline, the plan I have followed is simply to combine with the ordinary platinum toning salt another which will assist it in some measure in its work of displacing the silver. Of course, it is quite possible, nay, easy, to do the work with platinum alone, especially if it be employed in the form of tetra-chloride, but then the work becomes too expensive, for the proportion of platinum substituted bears an insufficient relation to actual work done. By combining the effect of some other bleaching agent, used in proportion, it is possible to secure the surface-toning action of the platinum before the whole of the silver is displaced, and the latter may then be converted to the metallic state, instead of being left in a condition of indefinite organic combination.

Let me say that I do not look to the auxiliary agents employed to take any part in the actual toning or the formation of the final image, nor, in adopting this process, do I hope to get any such range of tones as are possible with either gold or platinum used in the ordinary way. What I have aimed at is a final image consisting of silver and platinum of a black tone of more or less depth or richness. It is quite possible to obtain a certain amount of toning action, and that of a by no means unsatisfactory character, so far as temporary appearances go, by means of such agents as cupric and mercuric chlorides, but I should be one of the last to recommend their use on the score of permanency.

Of the bleaching agents I have so far tried I may mention cupric, ferric, and mercuric chlorides, together with ferric oxalate and ferric potassic oxalate. The two last I essayed in the hope that I might be able to set up, by the mutual decompositions that ensued, something like the developing action that occurs in the case of a platinotype print; but, up to the present time, I have not succeeded. The general action of all these is very similar, although the colour of the image and other miner details vary to some extent.

Combined with a solution of chloro-platinite of potassium of the strength of one grain of that salt to ten ounces of water, the toning action is much more rapid than with the chloro-platinite simply acidified; in fact, five or six minutes generally suffice to complete the toning. The progress of the action, the range of tones it passes through, and the ultimate colour, are all that could be desired; no undue amount of over-printing is requisite, nor are the pictures apparently reduced or bleached to anything like the extent that might be expected. In fact, up to the point of completing the toning, everything proceeds in much the same manner as gold toning under the most favourable conditions.

But the fixing bath, except in the case of mercuric chloride, removes everything except a more or less superficial image of platinum, which seems to go mainly for the shadows of the picture, while the bleaching agent apparently attacks first the finer details. In the case of mercury salt, the hypo produces a partial reduction of the metal, which, however only serves to spoil the colour without greatly improving the vigour of the image. This result is only to be anticipated, since the silver image is converted by all these agents, with the exception of the mercury, into a perfectly soluble form.

W. B. Bolton.

(To be concluded.)

CARBON PRINTING WITHOUT TRANSFER.

[Photographic Salon Conference.]

The subject which I have undertaken to bring before you to-night is one which I believe may be said to possess at least the advantage of novelty. I shall be disappointed, in fact, if I am unable to put it before most of you in such a way as to lead you to agree that some new points of interest have been opened up. By the diligent, and, I may almost say, "historical" student of the British Journal, I am pretty sure, I suppose, to be met with the usual reference to such-and-such a page of such-and-such a year ever so far back, and, if this epitome of photographic information is able to call my attention to many instances where the subject has been referred to, I can only say that my astonishment is the greater that practical results have not ensued in this country, which is famous for its photographic research. I will say at once that the question to which I refer is that of direct coating of paper with a pigmented and bichromated medium, and of direct development from the front of the exposed pigment instead of by the transfer process and development from the back. Almost every text-book which I have come across (though I will admit that my investigations in these matters are not very extended) has perpetuated, after the manner of text-books, the error —for I will call it so—that early experiments showed that the pigmented film floated off if treated from the front. The latest edition of the Autotype Company's manual, referring to Poitevin, says:—

"On coating paper with the compound of gelatine and bichromate, he found that, on putting the exposed pigmented paper into warm water, it floated off altogether. The Abbé de Laborde, in France, and Burnet and Blair, in England, pointed out the reason for the imperfect results arrived at by Poitevin; they showed that the pigmented compound became entirely insoluble on the surface which

had been in contact with the negative, and the warm water was prevented from getting to the soluble portions of the film, and it was clearly demonstrated that, if the pictures were to be developed at all, that could only be successfully accomplished by attacking the film on the opposite side."

Now, it is possible that, scientifically, these words may have quite an opposite meaning, but, so far as my intelligence goes, I can attach no other significance to them than the one I have just stated. It will be said perhaps that by the simpler method it is possible to obtain rough results without half-tones, and so on. Well, it is a comfort to know at least that the pigment does not in these cases float off the paper, for, in my opinion, these rough black-and-white results are capable of producing by photography very charming results. But I go further, and I say that for direct development we ought to be supplied with pigmented papers, or we ought to prepare them for ourselves, which, according to the results which we may require, from the black-and-white charcoal drawing, past *mezzo-tinto* effects of light and shade, up to the most extended scale from purest white to deepest black, should give us all varieties which we might desire to work with. I wish later on to bring before you the methods which produce at the one end of the scale these, no doubt, unworthy essays by myself and by M. Ladevèze, and at the other this very fine paper, so little known amongst us, called the *Artigue papier velours* —a paper which appears to me to be fit even for the highest scientific work. And this latter paper is practically coated directly, sensitised from the front (at least it may be so), and developed directly from the front. I may say that I claim for myself in these matters little credit beyond that of bringing these processes more prominently forward in this country. I was first of all attracted by M. Ladevèze's pictures in the Art Exhibition of the Paris Photo Club last January. They appeared to me to be the most, if not the only, artistic productions in that gallery which came from France. I put myself in communication with Monsieur Ladevèze, and have endeavoured since then to see what possibilities lay in the method. Quite recently I have been able to procure some of the Artigue paper. It is, I think, astonishing that this fine process should have been in existence since about the year 1884, and that we should here still be almost entirely ignorant concerning it. I propose to describe, and perhaps demonstrate, both these processes to you presently. Meanwhile, I should like, in pursuance of the synopsis which has been published of my lecture, to say a few words concerning the artistic possibilities which we may be able to find in them. I want to ask you, first, to consider this question, not so much from the point of view of the examples which I am able to show, as with regard to the principles which are involved. I am quite content with regard to my own little set of nocturnes that you should have your own opinions about them. You may like them or not. For my own part, it is but natural that I should be kindly disposed towards them. I have tried persistently to carry out the end I have in view; and, although I will cheerfully admit that the *Barge* especially will not appeal to all tastes, yet to me it says a great deal. If I am wrong you must blame me, if blame there is to be, for my bad taste. A first objection I have heard made to this kind of work (allow me to speak generally of it, and not with reference to my own) is that it could be just as well done with a brush and colour as with a stick of charcoal. Very well; I should much like to see examples, but until the objector produces them I shall hold the opinion that it is very easy for him to talk in this way, but that he does not know what he is talking about. You will see, I think, before we have finished, that the main feature involved in these processes, and the different methods of working them, is the personal control which is placed in the hands of the artist over the results which he desires to produce. And I say also emphatically here that these results must be, in essence, photographic; at least, as much so as other photographs where licence is permitted. The question of manipulation, which was so ably argued here by Mr. Horsley Hinton a fortnight ago, must, I am afraid, be reopened to-night. As I said in the discussion which followed, while avowing myself to be a defender of hand work (and this in the company, I think I may say, of the lecturer and of the chairman, Mr. Blanchard), we are entitled to ask from our opponents that they shall be logical in their condemnation; that is to say, that they are not entitled to approve here, and condemn there, according to their own inclinations or the reverse. In fact, to quote an old saying, it should not be allowable to "condone the sins we have a mind to by damning those we are not inclined to." Now, practices which appear to be universally condoned, and, as Mr. Horsley Hinton pointed out, are distinctly hand work, are vignetting, sunning down, adding clouding (often of a different character to that which existed when the landscape negative was made), matt varnishing and scraping off, shading with the hand, a cloth, or in other ways while printing, and stopping out, *cum multis aliis*, all of which are cheerfully assented to by most people. I shall take as two examples Mr. Robinson's *Storm*, and Mr. Craig Annan's delightful little snap-shots. With regard to the first, I will simply say that the rain-cloud descending into the landscape is distinctly hand work, an absolutely new addition. Has any one dreamed of objecting to it on that ground? In the charming little group of the two white monks, Mr. Annan has carefully obliterated the whole of the background, houses, landscape, or whatever it might have been, and in this other, of the Franciscan, how artistically has he, with added hand work, toned down the top of that wall! Has it occurred to any one to raise the remotest objection? Now, the method of development of such prints as these of M. Ladevèze and my own, is, first, warm water, then hotter, a light spray here, a strong spray there, a touch of a brush, and so on till the pigment has left the paper where you wish it to do so, and remains fixed where you wish it to remain. Am I to be told that, in order to produce a pure photograph, I must place my exposed paper in water of a determined accurate temperature, and allow it to act mechanically; that I may not stop the effect of the development when I like, but must go on to a determined point? Do you silver printers or platinum printers do so? Do you not shade the negative (hand-work), back it with varnish (hand-work), print it lightly, or print it fully out, according to the effect you wish to produce and the amount of clearness you desire? The whole gist of the question lies in this: Is a photograph to be rigidly produced by mechanism, or are assistance and alteration by the hand and craft of artist to be allowed? Now, it may be objected that some of these prints have an appearance of being worked with a brush. That is so. They show brush marks because a brush was used, and the effect is valuable. It could have been prevented from showing if it had been desirable to do so. Would the picture then have been more photographic? My argument is that it is now entirely so. The pigment is there where the light permitted to act upon it has caused it to adhere insolubly. It has been removed where it has remained soluble. In this nocturne the streak of light (moonlight or what you will) has been produced by shading the print in that part during exposure, as many likewise do, and the brush marks are equivalent in their value to the use of coarse-grained paper. Do not, I ask you, hastily come to a conclusion that, where an effect *may* have been produced by forcible abrasion, therefore this has been done. An objection to be anticipated is that the result does not truly represent the original negative. But what has the beholder of a picture to do with a negative? The true test is that an intelligent and artistic observer shall see no incongruities forcibly apparent. The public does not want a scientific expert's opinion, for it does not come to a picture gallery to be instructed in chemistry and optics.

In the Exhibition which we hold in this gallery we take little account of processes and the means which are used to produce the results which are put before the public. It is for this reason that I propose only to deal, in the manner of a summary, with the two methods which more particularly illustrate the ideas which I have just endeavoured to bring forward. These methods are, first, the directly coated paper, reintroduced by Mr. Rouillê Ladevèze, and next the Papier Velours, or sawdust process of Monsieur Artigue. I will endeavour presently to develop, in a rough-and-ready fashion, a piece of the latter paper, and at the conclusion of the discussion which may ensue on my lecture, if time permits, we will continue to experiment together in various ways upon a few other exposed pieces. You must understand that, with the inadequate facilities at my disposal here, I cannot undertake to produce any results of beauty in themselves, and I may say that, if it were possible under such conditions for any one to practically teach you how to produce them, I think there could be little artistic value in the process. I can only hope that you may be induced for yourselves to enter upon the track opened out. Taking first the Ladevèze system, and the modifications which may be used with it, this is practically Pouncy's process, first published in *Photo Notes*, January 1, 1869. The method consists in coating with a brush a sized paper with a mixture of a saturated solution of gum arabic, a saturated solution of bichromate of potash, and a sufficient quantity of the desired pigment. I think I may say that in most carbon processes gum is rarely mentioned, but always gelatine, as the necessary colloid to be acted upon and rendered insoluble by the bichromate of potash. The brushes used for coating are a flat camel's-hair brush, two or three inches wide, or, better still, what is known as a badger-hair softener. Nothing is more difficult than to give an even coating of a pigment on paper by hand, but with practice it can be done. It is easy to wash colour on so that by reflected light it shall appear uniform, but for these purposes it

should stand the test of transmitted light, and it is important that the colour should be intimately mixed and the coating as thin as possible. The pigment may, of course, be any colour; for blacks, prepared lamp-black, graphite, ivory black, or any other tube black, such as is used for water-colour painting, Indian ink, or preferably (as I have found) the liquid black now used for process drawings, and to be procured at most artist colourmen's. For reds, red ochre may be used, alone or mixed with black or other colours (a little blue softens the crudity), and, of course, almost any other colours are serviceable. But I have found that certain tube colours, notably some sepias, behave in a manner which is for me at present difficult to understand. It may possibly be interesting to use a white pigment on a dark paper, but for some reason beyond my comprehension Chinese white and similar white pigments are absolutely unworkable. They appear to prevent the pigmented layer from becoming insoluble, even with any amount of exposure to light, and I have not yet found any white colour which is suitable. Sulphate of barium appears to give the most promising prospects of success, but even this I have not yet been able to treat in a satisfactory manner. The whole subject, however, of pigments, which is of the highest interest, is one upon which it would be impossible to treat fully to-night. [The lecturer here showed several examples of papers coated in various ways, and demonstrated the methods of applying the coating.] The exposure is, of course, effected in a similar manner to that with which we are familiar in ordinary carbon processes, and you will excuse me if, with regard to this and other matters, I do not enter into details for the moment. Later on, if time permits, I shall be happy to reply to questions, and to give those who may not have so fully occupied themselves with the subject the benefit of what experience I may have been enabled to acquire. The method of development is briefly as follows:—The exposed paper is placed in a dish of tepid water, which is caused to flow over it, and the portions unacted upon by light removed as may be desired by rocking the dish, and by assisting the development by increasing the temperature, by aiding it with a brush, or by a forcible stream of water directed upon the parts which it is desired to remove, either by a brush or by an arrangement of this kind (described). Other methods will suggest themselves, such as sawdust, after the Artigue process; or a sponge in a funnel, and you will see that various kinds of *pipettes* or nozzles can be used with advantage, according to the effects which it may be desired to produce. But I should like to emphasise, above all, the necessity of correct exposure. I do not say that there is any such thing as correct exposure of universal application, any more than such a term can be said to exist with regard to the development of negatives; but correct exposure according to the result which you desire to effect. Negatives should be (but I say this generally only) somewhat hard, with strong contrasts. As an example, I give you this picture by M. Ladevèze, which I believe to illustrate my remark, the application of which I must leave you to appreciate. Retouching can, of course, be effected with the same pigment as that used for the original coating, but the action of the bichromate on exposure is liable to alter this, and I show you here an example in illustration. Referring once more to the coating of the paper, which, as I said, should give the finest possible layer, I think that for ordinary (not commercial) practice nothing could be better than the air-brush of Mr. Burdick. That gentleman was kind enough to come down to me, upon my suggestion, and experiment with its use. It can be made to give an extremely fine and equal coating; but I should advise you, should you make essay of it for these purposes, to use it for coating the unbichromated pigment to be afterwards sensitised, in order to avoid the disagreeable effects upon the throat and lungs of the spray of poisonous bichromate. As I have said, I have been obliged to treat the application of this process in a very summary manner. Almost every section of it, the paper, the pigments, the coating, and the development afford matter of interest and discussion in itself sufficient for an evening's lecture. But I feel sure that, if I can succeed in inducing you to look into the various points involved for yourselves, you will find them of extreme interest, and the sum of your practice and investigations will be of very great general interest. From the coating of the paper down to the finished production I can promise you matter for thought and distraction which will be far from being wasted, and even what may be called your failures will be of value from the indications which they may give to proceed in a direction which will lead to success. Incidentally I should like to throw out the suggestion of the use of bitumen instead of bichromate and gum. This may be dissolved in benzole, and intimately mixed with lithographic ink or other greasy colouring matter; coated on thin paper and printed through the back, the development can be effected with benzole or turpentine, and the picture afterwards mounted by transfer and washing off the original support with warm water. The chief point on which I desire to insist, and to which I referred at the commencement of this paper, is the entire freedom which is given to you by these processes, and the absolute work of your hands and brains which is placed in your power to make evident. It is a dream, perhaps, but I have indulged in it—that is, our art reduced to its very simplest expression with regard to the implements necessary to be employed—a dark box without a lens, a pigmented paper prepared with sufficient sensitiveness to form a negative, a positive from this, hot water, and no other production of the optician's and chemist's shop whatever, no mathematical formulæ, no abstruse calculations, no necessary investigation of the why and wherefore by means of cube roots, sines, and tangents, and other disturbing horrors.

ALFRED MASKELL.

(*To be concluded.*)

ELASTIC EXHIBITION RULES.

[London and Provincial Photographic Association.]

IT is in the nature of things that medal-giving creates and provokes fault-finding with, and criticism of, rules, and as Photographic Exhibitions seem upon the increase, rather than the reverse, we shall have to face more of it in the future.

Last year an earnest attempt was made at the Conference of Judges to make some sort of a standard set of rules, and, as far as possible, to limit the awards to reasonable proportions. It is universally admitted that their efforts have been productive of much good, but, at the same time, several misconceptions have arisen.

Firstly, as regards Exhibitions. There is a feeling that the Conference had no authority or right to set forth any standard rules, and, to speak plainly, that their action savoured of impertinence. This might be the case if the Conference had attempted to order that these rules should be observed at all Exhibitions. But this is where the misconception arises. They only say *We* will not judge unless these rules are observed, which is quite a different matter. Any Exhibition authority is at liberty to conduct its competitions just as it chooses; but, if for any reason it is deemed expedient not to follow the Conferences rules, other Judges must be selected.

Another misconception has arisen amongst the Judges themselves. A (very small) minority think that, in the cases of the smaller societies, they sometimes cannot carry out the rules in their pristine strictness, and that the Judges should be able to stretch a point in favour of such society. This brings us to the term, "Elastic Rules," which, to my mind, is idiotic. If it were the case of a hair-splitting difference, I, for one, would support this view; but when the elasticity means the absolute reversal or disregard of the rule, either in letter or spirit, it simply renders the Conference a farce, and the Judge who requires this elasticity is simply taking the leading part in the farce, "My Rules and How I Stretch Them." He agrees to certain rules, and then carries them into effect—when he chooses.

Both misconceptions arise from the failure to understand the true aim of the Conference. It may be asked of what utility the rules can be if an Exhibition is at liberty to set them aside? A very natural reply to this would be another question, What body in this country has any authority to lay down standard rules at all? The Conference approached the matter in a diplomatic fashion, and my idea of the spirit that governed the first meeting was that the thin end of the wedge should be inserted first in the scheme for reducing the lavish medal-giving, and to formulate rules for the guidance of Exhibition authorities.

In attempting to describe the aim of the Conference, the difficulty presents itself that it was not described actually in words, and, in giving my own views, they must be taken as my own only. There are, undoubtedly, cases where it is beneficial to break the rules. An Exhibition has, or should have, a dual object—the encouragement of photographic workers, and the enlightenment of the general public as to the advance of the art. It is perfectly conceivable that, in some place where a photographic exhibition has never been held before, the object should be to bring before the photographers and public generally the very best work obtainable. One way to do this is to offer medals, and to violate the rule as to previously medalled work. Neither the photographers nor the public care one jot about such a regulation. They want the best work, and I can confidently assert that this is the best way of obtaining a representative show of the very best work obtainable, and in saying this I am not overlooking the invitation Exhibition, where no awards are offered. Doubtless, in time, the latter will in all cases answer the purpose, but we are not as yet sufficiently advanced for this.

Now, in spite of the fact that I loyally abide by the rules adopted I should advise a society or body to disregard the rules in this case, and to select other Judges. Nay, further, I would myself organize and arrange such an Exhibition whilst still holding the Conference. But I should not ask any of the Conference Judges to depart from their signatures to act as Judges at such. In the case of large Exhibitions held at intervals, and Society shows held annually, these remarks cannot apply. They should be allowed no freedom in the matter at all.

Again we revert to the question of the utility of rules that may not be adopted. Well, it is just this: it is a graduated effort to accomplish a good end. The Conference have no power, nor has any body, to thrust rules down the throat of any one; but, if these Judges hold together honourably, as time goes on the rules will gain in authority and power. The list of Judges who have already signed is a good one, and might be still augmented. Most of the principal Exhibitions do and will continue to follow the rules, and ere long the effect will be seen and felt all round. And, further, it is better to leave the loophole of escape in a total non-observance than in any stretching or elastic absurdity.

Some of the Judges appear to desire to keep within the Conference as far as their names go, but at the same times, to have power to break the rules when they deem it expedient. Evidently their anxiety to judge is greater than their anxiety to observe the rules.

I have spoken of the absurdity of rule elasticity, and out of the several occasions upon which the rules have not been observed, but when Conference Judges have consented to act, I will only mention the two most recent, viz., the Aquarium and Leytonstone.

Rule 7 distinctly debars previously medalled work from competing with non-medalled work. At the Aquarium this was not carried out. Is this elasticity to directly violate the rule? At Leytonstone the negatives from which lantern slides are made are to be eligible for other awards when shown as prints. Rule 11 is to the effect that no production of any kind from one negative shall receive more than one award, and Rule 8 is to the effect that each picture of a set which has been collectively medalled is considered, for competitive purposes, to have received an award. At Leytonstone they qualify an equal violation by:—

"No competitor can, however, take two prizes of the same value, and any one picture cannot take an award in more than one class."

The last part of this is a red herring across the trail, for, if six lantern-slide negatives received an award as a set of six slides, which *one* of them is debarred? They cannot all be debarred, of course, but yet they say that any one picture cannot take two awards. Do they know where they are?

There is also another point that must not be overlooked, especially when we know that the spirit and aim of the Conference was *chiefly* the reduction of medals and awards. Most of the infractions that have taken place have been for the purpose of *increasing the number of medals*. How any Judges can, after the Conference, where at least six of the rules adopted were directly aimed at keeping the number of awards within due bounds, require elasticity upon this point is beyond my understanding. What, may I ask, is the meaning of the following, which appears above their signatures?—

"It was at the outset agreed that the decisions should take two forms:—

"(*a*) Rules which those present should consider as binding upon themselves, and without the observance of which they should refuse to judge;

"(*b*) Suggestions, which should take the form of recommendations to Committees or other bodies who may have in their hands the organization of exhibitions."

Both the *rules* and the *suggestions* were carried in most cases unanimously; in no case did the minority against any rule exceed two.

The undermentioned Judges have signified their intention of upholding the rules at all future open Exhibitions:—

Captain W. de W. Abney, C.B., R.E.
John E. Austin.
Valentine Blanchard.
F. P. Cembrano, jun.
Walter L. Colls.
P. H. Emerson, B.A., M.B. (Cantab.)
W. England.
J. P. Gibson.
Charles W. Hastings.
John A. Hodges.
F. Hollyer.
Frank Howard.
Richard Keene.
Paul Lange.
Edgar G. Lee.
Andrew Pringle.
Frank M. Sutcliffe.
J. Traill Taylor.
W. Wainwright.
E. J. Wall.
L. Warnerke.
G. Watmough Webster.
Walter D. Welford.

Can anything possibly be clearer? If, however, some of the Judges think they ought to be allowed to violate the above pledge whenever they choose, the sooner they remove their names from the list the better for their own credit and for the cause of the Conference.

The journalistic Judge must go. He has in the past caused considerable friction at times, and he is at present a direct menace to the success of the Conference rules. With him judging at Exhibitions is business, he does it in the interests of the magazine or paper he edits. His judging keeps the paper before the public, and it is in a way an advertisement; moreover, he renders assistance and pleases societies, and thus indirectly benefits his paper. He is therefore not likely to study the interests of the Conference before those of his paper. I am not theorising, for this idea of business has been distinctly laid down to me by one of them. I do not question the honesty or ability of the journalistic Judge, but he is certainly more likely to judge first, and consider the Conference rules after. Therefore, he must go, and, although it, of course, means my own effacement, for the good of the Conference I have already given notice of a motion to that effect, which I shall move at the next meeting. It may not be carried then, but it will certainly have to come about later on.

Finally, it is quite likely that all these remarks and arguments only serve to show how much better things would be if medals and awards were banished altogether, or at least left to photographic and other periodicals. At present, however, no one can legislate for such a state of things, as, for a few years at least, awards will continue. A suggestion on these lines was made at the last Conference, and eventually, no doubt, the principal Exhibitions will follow the lead of the Salon. But, of course, such a question is out of the province of the Judges' Conference, for the reason that no awards means no Judges.

WALTER D. WELFORD.

GAS CYLINDERS, BAGS, &c.

[Photographic Club.]

WHETHER the compressed-gas system at present in use for lantern purposes is satisfactory, or whether it is not, is a subject I do not propose to discuss to-night; but it is a fact that intelligent people do exist who, for some reason, sound or insane, are not satisfied with it. It may be that they have had some unpleasant experiences or sad disappointments with cylinders, or that they have not had any experience at all; or it may be that they are located a long distance from a large town or abroad, and where compressed gas is not always convenient to obtain; indeed, it may be anything; but the fact remains, *they are not satisfied*, and I have been consulted on many occasions on the question, What is best to be done in these circumstances? and it has occurred to me that it might not be out of place to review a few of the other systems—some older systems for providing illumination for lantern purposes.

We will make no attempt at chronological order, and begin with ordinary house gas by the incandescent burner (Welsbach). With a suitable pressure, this is a very nice and convenient light for a three-feet disc; but the burner will not stand any but the most careful usage.

Oil lamps have undergone many modifications during the past few years, but with little or no improvement in illuminating power. When a slight improvement has been shown, there have also been some counteracting disadvantages to contend with. It has been stated that by certain so-called improved lamps nine and ten-feet discs could be satisfactorily illuminated. Now, about this time last year I had one of these so-called improved lamps, with a lantern complete, as supplied by the inventor or his agent. This was tested, not only by myself, but by several lantern experts and others. When several friends and myself had made ourselves familiar with its working, we took it to a photographic society meeting and did our best with it, showing a seven-feet disc.

The members of that Society would not tolerate the poor illumination, and the size of the disc was thereupon reduced to less than six feet. I would not like to quote any of the remarks made upon the condition of the atmosphere of the room after that exhibition.

I believe it will be safe to predict that, when a nine-feet or even an eight-feet disc can be satisfactorily illuminated by an oil lamp, there will be more oil and less gas used for lantern purposes.

The electric is, in my opinion, the light of the future for lantern purposes; but, as this is only accessible to a few, we will leave it out of consideration for the present, and now we arrive at the limelight, which, as everybody knows, is produced by the intense heat of the oxyhydrogen flame directed on a piece of lime, which latter becomes

white hot—*incandescent*—There are many forms of burners or jets, and various modifications in the use of oxygen and hydrogen. We have the oxyhydrogen or "mixed" jet, in which the two gases are mixed in a small chamber just before issuing from the jet, and this is generally admitted to give the most powerful light; then, there is the "blow-through" jet; in this no mixing of the gas takes place, but a stream of oxygen is blown through a flame of hydrogen after the fashion of the ordinary blow-pipe, the illumination by this form of jet is inferior to the mixed jet; next we have the spirit jet, acting on much the same principle as the "blow-through" jet, only that methylated spirits of wine or alcohol is used in place of hydrogen; the light by this jet is inferior to the "blow-through," but it is a convenience to be able to use spirits where hydrogen is not obtainable, and perhaps it should be said here that, when we speak of hydrogen for limelight purposes, we mean coal gas (house gas).

And now we come to the saturator. This is a receptacle in which ether or benzoline is used as a substitute for hydrogen or coal gas; there are many forms of saturators in use, but the principle of them all is practically the same, and with them a "mixed" jet must be used. The illuminating power by a saturator is said to exceed all other forms of limelight; and, whilst I am not prepared to admit so much, there can be no doubt that this form far exceeds any "blow-through" jet; but saturators and mixed jets have been said to be dangerous; well, an ordinary paraffin lamp has been proved to be dangerous, and accidents, more or less serious, have occurred by them; but a great deal has been said about the danger of mixed jets and saturators by people who have not sufficiently studied the subject.

Now, it will be seen that, by all of these systems for producing limelight, oxygen must be used, and we have no substitute. Common air contains oxygen, but in so diluted a state as to be useless for our purpose.

The atmosphere contains about twenty-three per cent. of oxygen to seventy-seven per cent. of nitrogen by weight, or twenty-one per cent. of oxygen to seventy-nine per cent. of nitrogen by measure.

Now, there can be no disputing the fact that oxygen compressed in cylinders has the advantage of portability; whether this is the only advantage, or whether this advantage is seriously discounted by something else, we will not at present discuss.

Compressed gas in cylinders is no new idea; in 1820 there was a portable gas company in London, and about the same time Sir Walter Scott was chairman of a gas compression company in Edinburgh, so that compressed gas in cylinders is an old idea revived.

I admit that the suggestion of the revival of gas bags will be scoffed at by many lanternists of the present day; but it may be favourably received by others, and we must not forget that gas bags are still in use by many lanternists abroad, and I assure you they are again coming into use by some exhibitors at home.

I am willing to admit all their disadvantages, and can look back on many laborious experiences, and yet pleasant reminiscences. With my two huge gas bags, pressure boards, weights, and a triple lantern, the biggest four-wheel cab had never any space unoccupied by me in those days—indeed, a good spring cart was usually required. But gas bags to-day need not be the huge things of the past, for it will be remembered that only a few years ago biunial and triple lanterns were in most general use, and frequently as much gas was consumed by these in "lighting up," adjusting dissolvers, registering discs and pictures, &c., as is now used by a single lantern for an entire exhibition or a lecture, and it is admitted that the single lantern is the instrument of the day, and the one most generally used, so that gas bags now need not be much more than half the size they formally were, and when one bag for oxygen, with a "blow-through" jet, is not good enough, or where house gas is not available, we may use a saturator and our one bag of oxygen.

I will again remind you that in the days of biunial and triple lanterns saturators were not so perfect or so well understood as they are at the present day. Saturators, which are exceedingly troublesome and probably dangerous when used with a dissolving lantern, are quite safe and delightfully efficient when used with a single lantern under suitable conditions; the fact is, saturators are not suitable for dissolving lanterns.

But the use of gas bags implies the manufacture of oxygen? Yes, and by suitable appliances and pure materials there is not much more skill required than in boiling a pint of milk, and very little more danger. If an accident occurs to the milk, it will boil over and be wasted; if an accident occurs in the generation of oxygen, it will be wasted just the same, there need be no further trouble. Briefly, the process is this: A sheet-iron retort containing one and a half pounds potassium chlorate in crystals mixed with half a pound manganese oxide is placed over a gas stove of the Bunsen burner type; connected with this is a wash bottle, and to the outlet pipe of the latter the gas bag is attached. If a gas stove or Bunsen burner is not convenient, the kitchen fire will do, and the above quantities are sufficient to generate six feet of oxygen in a few minutes. But, in the manufacture of oxygen in this way, have not several more or less serious accidents occurred? Yes, but all of them have been traced to the use of defective apparatus and gross carelessness, or to the use of the wrong material. Now, because somebody accidentally shot himself by carelessly handling a gun, are we never to go grouse-shooting again? or, because some careless or ignorant druggist gave somebody carbolic acid for a black draught, are we never to take medicine any more?

But have not serious accidents occurred during the time the bags were in use? Certainly not, except when the gases have been mixed in one or both bags beforehand, and, although the mixing of gases in bags is the result of downright carelessness, this can be easily prevented.

But, again, it may be asked, Is it not possible, by the use of a mixed jet and two bags unequally weighted, for the gases to mix during the time they are in use? Again I reply, Certainly not whilst the light is on the screen or the limelight is maintained. But mixing could occur by a defective dissolving tap before lighting up the jet, and I have known these taps to cause considerable trouble and some alarm during an exhibition; but, as I have said, dissolving lanterns are fast becoming things of the past.

There can be no mixing of gases in bags or gas-holders of any kind by a single mixed jet whilst the limelight is maintained, and mixing of gases is only possible under the following conditions, which are not likely to occur: First, there must be two bags, unequally weighted. The taps of both must be turned on, and both taps on the jet must be open, and it would facilitate the mixing if the nozzle of the jet be stopped up; and, of course, during all this time the mixing process is going on there can be no light at the jet.

But, as so many lanternists, who have probably not had time to study the subject, seem to have a deadly fear of a mixed jet, I should like to say a few words more upon this subject.

Let us suppose that two bags were unequally weighted, and that the pressures be in the proportion of, say, one to two or one to ten if you like. We first of all turn on the taps at the bags, then we turn on one of the jet taps and apply a light. If we find it will not light we may be quite sure it is the oxygen, for oxygen will not burn by itself, so we turn off this tap and try the other. This time we get a light, and we know it is the hydrogen, and that hydrogen or coal gas will only light at the nozzle of the jet, just as it does at the burner of our house chandelier. The flame cannot run down the pipe if only coal gas be present, not even if the pressure be removed. In other words, hydrogen will not burn by itself; it must have oxygen or air, and as the material of which gas bags are made is not air-proof, coal gas should never be kept in a bag for more than a day, and the bag should be thoroughly emptied before recharging. Well, having got a light (hydrogen flame), we next turn on some oxygen, and, by adjusting the pressure to something like equal, we produce the limelight, which, as we have already seen, cannot be obtained by one gas alone—*we must have two gases.* Now we are able to understand that, when the light is on and two gases are being supplied, no mixture can take place in any part of the apparatus except in the mixing chamber of the jet, not even in the tubes from the supply, nor in the tubes forming part of the jet would it be possible for any mixing to take place; and it matters not how unequally the pressures of the gases may be in the bags so long as two gases are being used, *for we cannot have one gas passing up a tube at a low pressure and another gas passing down the same tube at a high pressure both at the same time.*

If we turn the oxygen tap more than is necessary, the light would suffer very considerably, and we should turn it back again, but even yet there can be no mixing in the tubes because we are yet burning hydrogen if we still increase the pressure of oxygen; the light will be blown out and we shall be in the dark: but somebody has said that the hydrogen flame might be blown down the tube; well, I have tried very persistently to do this, but have never succeeded; but, even if we admit that by some mysterious process the hydrogen flame might get blown down the tube, a properly made back pressure valve would prevent it, and there could be no damage; if we turn off one of the taps and cut off the supply, all would be at an end.

Now let us consider the other side, and suppose the pressure of hydrogen to be in excess; there would be a big roaring flame in the lantern, and I do not think that would be allowed to proceed very long, but, if continued, the flame might go so far down the jet as to make it red hot and it might melt, but the flame could not sneak down the tube for reasons I have already explained.

I, therefore, maintain that the "mixed" jet is by no means the dangerous instrument many suppose it to be, and also that there never was an explosion attributable to bags when a single jet or a single lantern was in use with either a mixed or any other form of jet, *unless* the gases were mixed in the bags beforehand, though, as I previously stated, mixing might take place through the defective dissolving taps of a biunial or triple lantern, or through the coal gas being allowed to remain in the hydrogen bag too long. (Oxygen may be kept in a bag for a long time; if air does get in, it simply dilutes the gas, and it would not produce the best light.)

The simplest way to prevent the mixing of the gases in bags is to use only *one* bag (for oxygen) with a blow-through jet or a saturator, and never to borrow or lend a bag.

But even when two bags are used, one for oxygen and the other for hydrogen, there can be no possibility of putting the wrong gas in the bags if simple precautions are adopted in the first place, and such as were advocated and in use by myself over twenty years ago—my hydrogen bag was black, the tubes were black, and the tap on the jet was black; the tap on this bag was made to receive an ordinary $\frac{3}{8}$ rubber tube, that it might be connected to any ordinary gas bracket for filling. But the oxygen bag was grey, the tubes all through the process of gas generation and use were grey, and the tap on the jet was light colour (the usual brass lacquer), but the tap on the oxygen bag had a three-quarter-inch external diameter screw, union or coupling, on which no ordinary tube would fit, the other part of this union was fast inside a tube, at the other end of which was a similar coupling which connected with the wash-bottle of my generator, and the tube for supplying oxygen from bag to jet was also supplied with a union coupling at each end and also a screw union on the oxygen tap of jet, no part of tubes or connexions of one bag could be made to fit the other. I could set any inexperienced person to connect up my apparatus with the greatest confidence; if they made the connexions at all, they were bound to be right. But, by a blow-through jet or a saturator and one bag, there is no necessity to go to even these simple precautions; with a blow-through jet and a bag of oxygen there is no more danger than in sitting before a lighted candle, a paraffin lamp is a dangerous thing in comparison.

I was questioned the other day as to what would happen by the falling of a weight from a gas bag whilst in use with a blow-through jet. In reply, the supply of oxygen being stopped, the lime would cool, and there would be no light on the screen, nothing more serious could take place. But how if a weight was suddenly removed from a pair of bags whilst in use with a "mixed" jet? Would there not be a "suck-back?" Yes; by releasing the pressure the bags would expand, and they would suck back their own gas if we had no back pressure valve, and we should be again in the dark. There might be an explosion in the mixing chamber of the jet, which would be heard by a "cracking" noise; but, as the mixing chamber is not usually larger than the capacity of a lady's thimble, the explosion would not amount to much, and nothing more serious could happen unless the gases were mixed beforehand, as I have already stated.

But what is the cause of the "cracking" noise we often hear at a lantern exhibition? Explosions by small quantities of mixed gas, generally caused by a faulty dissolving tap, or when the dissolving tap is not properly adjusted. Well, suppose a weight were to fall from a single bag whilst in use with a saturator and a mixed jet. That would be more serious; and, as the saturator contains an inflammable mixture, it would in all probability take fire, and, to guard against this, means should be provided for securing the weights to the pressure boards.

I have known several cases of saturators taking fire, generally through being used with a dissolving lantern, but for which I have said they are unsuitable.

Which is the best form of saturator? That would be difficult to answer, but the one I am much in favour of is the simple tube (or a pair of tubes), stuffed with an absorbent material, such as coarse flannel, and said to have been first introduced by Ives, of America, though now manufactured in England. This is best kept and used in a box free from draughts and changes of temperature.

And now we must say a few words on fixed gas-holders. When a lantern is used always in the same place, fixed gas-holders have considerable advantages over gas bags or any other means of storage, and may be of very simple construction. One of the first gas-holders in use was constructed out of a second-hand brewer's vat for the Chartered Gas Company in 1823, and one of the latest has been constructed by a friend of mine from an old wine cask, or, rather, two wine casks, with one end of each removed, the larger being sunk into the ground in his garden, and the smaller inverted inside the larger one, which latter contains water. Another gentleman has quite recently fixed in the cellar of his house a thin sheet-iron holder, two feet in diameter by three feet six inches long, having a capacity of eleven cubic feet. A small lead pipe conveys the oxygen through the ceiling and into the room in which he mostly uses the lantern, and by a small water cistern and ball tap the pressure is applied, and is always uniform. He says he can fill the gas-holder in about twelve to fifteen minutes, he obtains a better light, he has no disappointments, no trouble with gauges or regulators, no leakages, and, best of all, no fear, and can go on working comfortably for three or four hours, depending upon the quality of illumination required.

It will be noticed that I have not said anything about portable gas-holders and generators. Well, many of you will recollect that some years ago I placed such an apparatus before the public; they were successful when "blow-through" jets were used, and when coal gas was available, and many of these portable generators are in use to-day. Of course many years have elapsed since they were made, and they might be considerably improved upon now.

Now, I wish it to be clearly understood that I am not advocating bags or fixed cylinders. I am not advocating anything; I have simply strung together a few notes, mostly of things of the past, for your consideration.

W. I. CHADWICK.

THE PRINCIPLES INVOLVED IN ENLARGING.

[Widnes Photographic Society.]

THE enormous strides which have in late years been made in the production of sensitive materials have rendered the pursuit of this most interesting branch of photography comparatively easy. Not only can sensitive paper now be procured with various qualities of surface, but of varying degrees of sensitiveness, the slowest produced being very considerably quicker than the paper one used to prepare for oneself in the days before the advent of gelatino-bromide. Yet, years ago, I will remember how proud I was of some very poor productions obtained with an exposure of many minutes, the source of illumination being limelight. Now, only a few seconds' exposure to the light of an oil lamp is required, and no trouble whatever in the preparation of the sensitive material. Nevertheless, there is a prejudice against an enlargement on bromide paper, many persons maintaining that satisfactory results cannot be produced on this material. I am free to admit that the best possible results are probably obtained by a contact print in platinum or carbon from an enlarged negative; but, at the same time, I maintain that very much more beautiful bromide enlargements can be produced than one very often sees, if only the conditions necessary for their production be observed. The failure to produce satisfactory enlargements on bromide paper is probably chiefly due to the fact that it is utterly impossible to produce a good enlargement from a negative which will yield a good contact print, and yet one negative is generally expected to serve both purposes.

There is also a general impression that the production of a good enlargement involves the use of a light of high intensity, preferably daylight, or, at any rate, such an illuminant as limelight. I believe that this impression is altogether a fallacy, and that, on the contrary, given a suitable negative and a correct exposure, a perfectly satisfactory result can be obtained with artificial light of extremely feeble intensity. I believe this mistake has arisen from attempting to produce enlargements from negatives of ordinary density with light of low intensity. The prolonged exposure necessary in such cases has not been realised, and under-exposure has resulted; while, with daylight, it has been easy to secure a more adequate exposure, and the better result has been attributed to the higher illuminant. But neither daylight nor any other light will ever produce a satisfactory enlargement from an unsuitable negative. The only advantage that appertains to the use of daylight is that it does not necessitate the possession of an optical lantern; but otherwise the balance of advantage is infinitely in favour of the lantern. Daylight is fickle and more difficult to gauge accurately than an oil lamp; then, again, it is only available in the daytime, while enlarging by oil light can be conducted at any hour, day or night, a matter of considerable importance to the amateur, at any rate.

The essential conditions to consider in connexion with enlargement are, first, the quality of the negative required; and, secondly, the estimation of the correct exposure, and to these points I shall almost exclusively confine myself. I intend to say very little about the use of the optical lantern with which you are probably all familiar, and, as I do not pretend to be able to convert an under or over-exposed bromide print into one correctly exposed by any

mysterious compounding of the developer, I shall have very little to say about the extremely simple operation of development.

I will therefore proceed to consider the characteristics of a negative suited for the production of a bromide enlargement, and I will try to show you the grounds upon which these characteristics are based. The consideration which determines the character of the negative is the range of gradation which bromide paper is capable of yielding. The range of gradation of the negative must coincide with the range of gradation of the paper if a satisfactory result is to be looked for. By the range of the paper I mean the ratio existing between the two exposures, one of which just falls short of producing any deposit, and the other which just suffices to produce the deepest black which the paper is capable of recording when viewed by reflected light. Say, for example, that an exposure of five seconds just fails to produce a deposit, and that one of 160 seconds just produces maximum blackness, the range of the paper would be as 5 is to 160, or as 1 is to 32. Now, obviously, for a negative to exactly correspond with the paper range, its capacity for transmitting light must have the same ratio, that is to say, the ratio between the opacities representing the deepest shadow and the highest light must also be as 1 is to 32. Inasmuch, however, as we measure the densities of the negative, and not the opacities, and, as the densities are, as you will remember, logarithms of the opacities, it amounts to just the same thing, and we find it much more convenient to express the range of the negative as the difference between its highest and lowest densities. But, in order to compare the range of the negative expressed in this way with the range of the paper, we must take the difference between the logarithms of the two exposures which produced the extreme paper range, thus:—

Negative.

Maximum density	1·735
Minimum „	0·230
Range	1·505

Paper.

Logarithm 160	2·204
„ 5	0·699
Range	1·505

In such a case the negative and paper ranges would absolutely agree, and the best possible result, subject to further considerations, would be obtained. V. C. Driffield.

(*To be concluded.*)

Our Editorial Table.

Fotochimica dei Sali di Mercurio e Processi Fotografici.

By Prof. Rodolfo Namias. Modena: Namias & Co.

Professor Namias' pamphlet is devoted to the various uses which the mercury salts may be put to in photography, notably, printing, intensification, &c.

Carbon Printing.

By E. J. Wall. London: Hazell, Watson, & Viney.

Mr. Wall's little book appears at an appropriate time, for there is no doubt of the increasing popularity of carbon printing, even among those whose work is of a limited or casual nature. Opening with an excellent historical outline of the process, prominence is then given to Swan's celebrated carbon patent, and the remainder of the book treats in ample detail of single and double-transfer printing, practically applied. The information is concise and sound, and the book should be of real assistance to the amateur carbon printer.

Lumière's Lyons Bromide Paper.

Fuerst Bros., 17, Philpot-lane, E.C.

From Messrs. Fuerst Bros. we have received for trial samples of the newly introduced "Lyons" Bromide Paper of Messrs. Lumière. So far as can be ascertained in actual use, the paper appears to be coated with an emulsion of rather greater rapidity than usual. The kind of image yielded is of exceedingly good and delicate quality, there being an absence of extreme heaviness in the shadows, the half-tones and fine details being well rendered. The "Lyons" is an excellent bromide paper. We may add that in our trials we used amidol. The following are the instructions given for developing the paper:—

"Amidol.

For Contact Printing.

Water	1000 parts or	10 ounces.
Sodium sulphite, crystal, pure	20 „	100 grains.
Amidol	5 „	25 „
Bromide potassium (10 per cent. solution)	20 „	1½ drachms.

For Enlargements.

Water	1000 parts or	10 ounces.
Sodium sulphite	10 „	50 grains.
Amidol	5 „	25 „
Bromide potassium (2 per cent. solution)	10 „	50 minims.

Metol.

Metol	20 grains.
Sodium sulphite	120 „
Sodium carbonate	90 „
Water	10 ounces.

Add bromide (1:10) as found necessary. Dissolve the metol first in the water.

Expose at a distance of about two feet from a kerosene lamp or a gas flame. The time of exposure varies from five to fifty seconds, according to the quality and intensity of the light and the density of the negative. Very thin negatives should be printed by weak yellow light in order to obtain vigorous prints. No clearing bath is necessary. As this paper is very sensitive, we may recommend users to adopt the usual precautions, the same as for gelatino-bromide dry plates."

The Half-tone Process.

By Julius Verfasser. London and Bradford: Percy Lund & Co.

This work purports to be "A Practical Manual of Photo-engraving in Half-tone on Zinc and Copper," the aim of the author being to make it really practical. In it are given descriptions of the nature and uses of the screens in use for imparting the grain, the printing and etching of the plates, the mounting of the blocks; and, lastly, there is a chapter on failures, and how to avoid them.

The manual can be strongly commended to those about to try this useful and increasingly popular department of photography. Price 1*s.* 6*d.*

A Hand Lanternscope.

Mr. William C. Chipper, Highgate-hill, N., has brought out a handy little instrument for viewing lantern slides. It is of pyramidal form, with a slot across the top, through which the slide is dropped into grooves, a magnifying-glass at the apex, and a handle underneath. It is light and convenient to handle.

Irish Views.

By the Victoria Photographic Company, 89, Milkwood-road, Herne-hill, S.E.

The fact of the late successful meeting of the Photographic Convention of the United Kingdom having been held in Dublin has given a new and sustained interest to picturesque and antiquarian Ireland as affording subjects of unsurpassed charm for the camera. Mr. R. Ward, of the Victoria Photographic Company, during a long residence in Ireland, had an opportunity of securing a large series of negatives of many of the old castles, abbeys, and churches with which the sister isle abounds, and these, together with the prints of same, we have had an opportunity of examining. Many of them are of subjects with which we became familiar during our late visit to Ireland, and include such well-known places as Shandon Church, Cork (a difficult subject, being a lofty church hemmed in with houses), Blarney Castle, Glendalough, Bandon, Mitchelstown, Killarney. All these and many more attest Mr. Ward's skill as an excellent photographer, with a strong aptitude for successfully surmounting the difficulties of outdoor and architectural photography.

Views of the Hook of Holland.

By the Victoria Photographic Company, 89, Milkwood-road, Herne-hill, S.E.

We have had submitted to us for inspection several views of the Hook of Holland, recently taken by Mr. W. Compton, of the Victoria

Photographic Company, of 89, Milkwood-road, Herne-hill, S.E. It is due to the enterprise of the Great Eastern Railway Company that this new route to the Continent has been opened up. It traverses most picturesque but hitherto little known parts of Holland, which are likely in the immediate future to be increasingly popular with tourists. The views chosen by the Victoria Photographic Company show characteristic bits of scenery in and about Amsterdam, Rotterdam, the Great Eastern Company's new steamers, the quays of some of the old-world towns, and rustic and river scenes. They are clever and effective studies, and, in our opinion, nothing would so much conduce to the further popularity of the Hook of Holland than the publication broadcast by the Great Eastern Company of these admirable and well-chosen views.

CHARLES EHRMANN.

EHRMANN is dead. Another life that has been devoted to our beloved art-science is ended. Once more we mourn the loss of one of our *confrères*, not this alone, but the loss of a true friend, a willing and kindly adviser, and a warm-hearted man—a loss that will leave a void in our hearts not easily filled.

Carl August Theodor Erhmann, as he was christened, was born on June 28, 1822, in a small town in Prussian Silesia. Subsequent to his graduating from the college he devoted himself to the pharmaceutical art. After completing his apprenticeship, and working in a drug store and laboratory for about two years, he went, in 1847, to the University of Berlin with the intention of enlarging his knowledge and eventually preparing for the State examination, which he did later on. His tutors were Milscherlich, Heinrich Rose, Rammelsberg, Magnus Dove, and Sonnenschein.

About this time the political storm broke out over Western Europe, a fact that had a very great influence on young Ehrmann, altering the whole of his career.

With youthful ardour and enthusiam he threw himself into the battle for the "black, red, and gold," and was under arms in the March days of 1848, participating in the first Schleswig-Holstein campaign as one of the guerilla party, and in the revolts of the Silesian weavers. We next hear of him in the revolution at Dresden, and, after pursuing an adventurous career in other places, he returned to Berlin.

By this time peace and order had been once more restored in the Prussian capital, and Ehrmann had the intention of settling down quietly, the wiser for his experiences. It was not to be, however; the past had not been forgotten by the irate officials, and they pursued and persecuted all those who had taken part in the rebellion. Unwilling to submit to such treatment, he gathered together his small stock of belongings, and, in company with several old friends and comrades, set sail for old England. The condition of England at that time was, however, by no means favourable to the political refugees, and so he determined to go to America.

After a stormy trip, occupying ninety days, an amusing contrast to the time taken at the present day by the ocean flyers, he arrived in New York Harbour.

In this country he first devoted himself to agriculture, and settled down in the State of Michigan. The dull monotony of farm life was hardly suitable to him, and he went to Mexico to hunt for gold. Like many others, however, he found the country far from being like the famous Tom Tiddler's Ground, and he returned once more to New York, the city of hopes, failures, and a few successes. For a long time he numbered with the failures, accepting a position as a prescription clerk in a Philadelphia drug store. It was here he came into contact with McClees and German, who were carrying on a successful Daguerreotype business, and who intended to embrace the Talbotype process, the Rev. Mr. Hill's heliochromy, which turned out to be a complete humbug, or Whipple's albumen honey process. They finally adopted the last-named method, but found far greater difficulties in the way than at first supposed.

Some little time ago Ehrmann, at our request, commenced an autobiography, but was never able to complete it. In this, however, he mentions the incident we refer to, together with many other facts of historical interest, and so we will continue this story of his life in his own words. He says:—

"I met McClees, was introduced to him, and he asked me if I knew anything about chemistry. I answered modestly, 'yes,' to some extent. Then Mr. McClees spoke to me about coming to his photographic department to undertake to make pictures by the Whipple process. The greatest difficulty that all my predecessors and my employers had in the preparation of albumen plates was, that they could not coat the glass plate uniformly, and here came to my rescue an experience that I had gained with working in a pharmaceutical laboratory, viz., in order to prepare for the market citrate of iron and ammonia, we coated large glass plates with a solution of the substance reduced to a certain concentration, and, when dried, scraped that off. The coating of a plate with albumen mixture appeared to me at once to be analogous to that of coating a glass plate with the iron solution, and when I first took hold of the matter I was perfectly successful. We had clean plates, uniformly coated, and they developed evenly all over. The albumen plates did not work with sufficient rapidity to take portraits directly, but, in order to circumvent this difficulty, we took Daguerreotypes first of the person that wanted a Talbotype or a photograph, and copied that afterward upon an albumen plate. At one time there came a big order for six quarter-size Daguerreotypes to be enlarged to 11×14 size, to be coloured and framed, which amounted to several hundred dollars. The following Sunday I went to the atelier, and undertook the job on my own responsibility. I was successful with my first attempt, with the second, with the third, and up to the last. I printed from my negatives good prints in our estimation then, and Mr. McClees, when he saw my work, was so highly delighted with the result that he raised my salary—which was originally $5 a week—to $15, and gave me a new suit of clothes and a hat.

"About that time I became a card for Mr. McClees and all the other photographers in Philadelphia. I made good pictures and good negatives, some of which I presented to Columbia College and also to the National Museum of Washington. They are, to say the least, relics of the oldest time of paper photography. At that time there were two amateur photographers, one of whom was noted in the United States, partly for his photographic ability and partly for his enthusiasm to legally defend patent suits, &c.—Constant Gouillot—and the other was Ed. Thilgman, a civil engineer, connected with the Philadelphia gas works. There was also old Mr. Cornelius—actually the father of photography in this country, for he made the first portraits on the Daguerreotype plates—and the renowned and scientific Dr. Paul Beck Goddard. They were all gentlemen of high scientific attainments, and through their influence upon me I have learned a great deal, and am very thankful to them and to their memory.

"The albumen honey process was not accepted as readily as might have been expected, although extremely fine work had been done upon plates of that description. As the photographic business proper was not extensive enough to employ one man constantly, I was often relegated to the Daguerreotype room. I learned Daguerreotyping, so that I was able to make a good Daguerreotype, and, if I had the opportunity to do so, could do it at the present day.

"In the mean time—it might have been at the beginning of 1852—Mr. Ed. Thilgman had been in Europe, and made the acquaintance of Mr. Archer, of London. Mr. Archer, who had been the first to introduce the collodion process, gave Mr. Thilgman a six-ounce bottle of collodion and a twelve-ounce bottle of developer—pyro and soda in one solution. Mr. Thilgman handed these new materials to me. I tried them; my associate, John C. Parke, did the same; Mr. McClees, Mr. German, my old chum, William Bell, and many others, and we all came to the one conclusion, that this stuff called collodion could not possibly be used for making pictures. We went back to our albumen, and practised it as much as possible. At last a man from Boston, James Cutting, took out a patent for bromised collodion. He sold his patent right and left, in every direction, and photographic pictures upon collodion were then made. I give him the credit of having made the collodion process practical, but more credit belongs to Isaac Rehm, of Philadelphia.

"The collodion pictures we made then were a sorry lot to look at, and when the first gelatine pictures were made we, the old hands, could very easily compare the ill success of the two processes, and for that reason have the old operators always looked with confidence upon the gelatine plate, because they knew very well that it required a gread deal of toil, labour, and attention to make a new process work successfully. The numerous failures to obtain printable and sufficiently intense plates with collodion gave rise to the collodion positive, ambrotype, the melanotype, the picture that is now vulgarly called the tintype. Many of our most important photographers—like Marcus Root, of Philadelphia; Samuel Rudd, of New York; the renowned Brady, Gurney, Fredericks, Brinkerhoff, Becker, Lawrence, and Hyatt—all dropped the Daguerreotype, and adopted in its place the tintype or ambrotype. Fortunately the ambrotype had but a short life. The more we became acquainted with the action and the working of the collodion, the sooner we were enabled to make pictures on the wet film, and singularly enough, within a few years, a great many men became proficient as collodion operators. At that time a good collodion operator was a big man. He used to receive from $40, $50, to $70 salary a week, with a percentage attached every year, and we all lived in clover. The gelatine business knocked us all out—made us all poor men.

"At that period we printed our pictures mostly all upon plain silvered Rives or Steinbach paper. We sensitised it by the solution described in the fourth edition of the *Photographic Instructor*, and had splendid results. I have in my possession a picture of my wife and one of my children which was printed in July, 1861. These pictures were toned in the combined hypo and gold bath, and, as they have preserved their purity and brilliancy, there is surely no better argument than that for the utility and usefulness of the combined bath."

When, in 1881, J. Traill Taylor was appointed editor of the *Photographic Times*, Ehrmann was one of his associates, and ever since he has taken an active part in the publication, contributing many valuable articles to its pages.

In 1866 the Chautauqua University established a School of Photography, and Ehrmann was appointed Instructor, a position he held to the

last. His kindly manner and his devotion to photography endeared him to all his pupils, numbering many hundreds. He was untiring in his energies and endeavours to teach, and there are very many successful photographers, both professional and amateur, who owe much of their success to his able tuition.

In the spring of last year the partner of his joys and sorrows died. So long and happy had been their union, that the old man never recovered from the loss he had sustained. With painful anxiety we watched him daily weakening in health. Life for him had ended; he had lost all that was dear to him in this world; he had nobly done his duty, and thus he made no efforts to regain his health. Weaker and weaker he grew until Tuesday, the 23rd inst., when he obtained his release, and departed from this world of trial and tribulation to the great unknown land wherein reigns the Great Master, whose words ring even above the tumult of ages: "Come unto me, ye that are weary and heavy laden, and I will give ye rest."—*Photographic Times.*

News and Notes.

National Association of Professional Photographers.—A Council meeting will be held this afternoon (Friday) at Anderton's Hotel, Fleet-street, at three o'clock, to be followed by a dinner at five p.m.

Royal Photographic Society.—Ordinary Meeting, November 13, at 8 p.m., at the Gallery, 5A, Pall Mall East. *A Simplified Form and Improved Type of Photographic Lens,* by Mr. H. Dennis Taylor. Presentation of the medals.

From Mr. Wilfred Emery, of 24, South-street, Baker-street, W., we have received some pleasing samples of photographic Christmas cards. He is making a specialty of them this season from photographers' own negatives.

The Photographic Exhibition.—Lantern fixtures for the week:—Monday, November 12, slides by members of the Amateur Photographers' Field Club. Wednesday, November 14, slides by members of the South London Photographic Society and Manchester Photographic Society.

Photographs of Temple Newsam.—In connexion with the recent visit of the Duke and Duchess of York to Leeds, Mr. Richard Keene, of High-street, Burton-on-Trent, received a commission to take several views of Temple Newsam House, in which the Duke and Duchess temporarily sojourned. The result is a number of interior and exterior views, together with two groups in which their Royal Highnesses also figured. The photographs are admirably executed, the interiors being in some cases of a difficult nature. Mr. Keene is to be congratulated on the excellent quality of his work.

It is proposed to hold a "Light and Heat Exhibition" at Woodhouse Park next year. The Park is situate at Shepherd's Bush, and is, therefore, in direct communication with all parts of London and the suburbs. The exhibits will be classified into eight divisions, viz.: Gas lighting; electric lighting; various illuminants; heating and cooking apparatus; naval and military; scientific apparatus; photography; historical. The promoters' intention is to hold a series of technical exhibitions on the same site. Further information can be obtained of the Hon. Secretary, Woodhouse Park, Shepherd's Bush, W

The Hackney Exhibition.—Mr. Fenton Jones, the Hon. Secretary of the Hackney Photographic Society, informs us that the entries for the Exhibition, which opens on November 20, exceed all previous ones, many late comers having to be refused. Among the exhibitors will be Messrs. W. J. Byrne, W. M. Warneuke, A. Diston, Mummery, J. H. Gear, A. Brooker, Scamell, Horsley Hinton. America is represented by Messrs. W. B. Post, A. Streglitz, Clarence Moore, G. C. Baker, R. Eickemeyer. Mr. C. H. Oakden officiates as the "Hanging Judge." Mr. S. J. Beckett is to show a novelty, *The Crater of Vesuvius,* produced in colours by, it is said, pure photography.

The London County Council and the Photographic and Engraving Trades.—Public attention is now being directed to the urgent necessities of the rank and file of engravers, who have been almost completely deprived of their employment through the general adoption of photographic processes. Not only is the new form of work given to specially trained Germans, but the English workers are prevented from learning the new methods by the extreme secrecy maintained in the various trade houses. In view of the rapidly extending applications of photographic processes to the publishing and printing trades, and the consequent demand for process workers, the London County Council, in conjunction with the authorities of the Regent-street Polytechnic, are providing facilities for practical and technical instruction in the various photo-mechanical processes at nominal fees. The photographic department at this Institution is being extended by the acquisition of additional premises, which will be equipped with all necessary appliances for the purpose. This equipment will enable the Polytechnic authorities to supply complete facilities for instruction in photo-mechanical work, such as are provided in these special subjects at the splendidly equipped Municipal School of Photography in Vienna.

The Alpine Club Picture Exhibition.—For many years past an exhibition of Alpine pictures and photographs has been held in conjunction with the Winter Dinner of the Alpine Club in December. Since, however, the show was kept open only for twenty-four hours, and was buried in the imperfectly lighted ground-floor rooms of the Hôtel Métropole, very small opportunity was afforded to members and the public of profiting by it. It has been felt more and more every season that the pains and trouble taken in the collection and arrangement of the pictures was to some extent thrown away. The Committee have, consequently, in response to a general wish, determined to hold an Exhibition in the Nineteenth Century Art Gallery, Conduit-street, and to keep it open for about a fortnight. It is proposed this year to make the Exhibition representative, as far as possible, not only of the past year's productions in mountain art and photography, but also of the work of artists, whether members or not of the Club, who have attempted mountain and hill scenery. The Club has never limited itself to what lies above the snow-level, and it will not do so in this Exhibition. There must be numbers of interesting old pictures and prints of Alpine scenery existing in the seclusion of private collections. The Club would be glad to organize a Historical Collection. But this may have to be postponed to another occasion. The Exhibition will be opened to the public on December 12. There will be exhibitions of photographic lantern slides in the evenings, at which Alpine, Caucasian, and Himalayan views will be shown by members of the Club.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 20,768.—"An Improved Hand Camera." A. S. Jones and S. J. Levi.—*Dated November,* 1894.

No. 20,864.—"Improvements in or connected with the Process of Printing from a Photographic Negative." Complete specification. A. P. Negley.—*Dated November,* 1894.

PATENTS COMPLETED.

Improvements in Collapsible Magic Lanterns.

No. 12,230. Alfred Wrench, 50, Gray's Inn-road, London. *September* 1, 1894.

My invention relates to magic lanterns, and has for its object to provide a lantern which can be folded or collapsed into a much smaller space than a lantern of similar capabilities (as regards the diameter of the disc illuminated and the focus), as heretofore constructed, and also to provide means whereby the lantern when extended or opened out will be more rigid than heretofore.

A lantern constructed according to my invention has a metal body, having at the back a hinged door, and on the inside of the front a cell for carrying the condenser. To the front of this body is fitted a frame carrying the staging for the slides, and having connected to it by lazy-tongs levers the front plate carrying the objective mount, screws being provided for fixing the lazy-tongs levers, and so ensuring the rigidity of the extensible portion of the lantern. The space between the said frame and the plate carrying the objective mount is provided with a leather bellows. The objective lenses and some other loose parts are adapted when the lantern is folded up or collapsed, to be carried in a box or case designed to fit within the lantern body, and the lantern body itself with all the parts which it contains are enclosed in an outer box.

Improvements in Photographic Cameras.

No. 16,091. Herbert Smyth, 123, Lancaster-road, Notting Hill, London, W. *September* 29, 1894.

This invention relates to an improved construction of photographic cameras, and is intended to provide a pocket camera for making instantaneous pictures, which can be directed to the objects more accurately than those commonly in use, and which can be more conveniently manipulated.

The camera is arranged so as to have an appearance similar to that of a revolver, and is pointed at the object to be taken in a similar manner, a trigger in the usual position at the front of the handle releasing the shutter and making the exposure. A cylinder is employed, bored longitudinally at top and bottom to form two tubular chambers, in the upper one of which the films or plates are held ready for use, and in the lower the films already exposed are retained. The cylinder is provided at the front with two caps, which can be turned upon it, one serving to remove the front film after use from the exposure chamber to the lower receptacle, and the other carrying the tube or barrel in which the lens is fitted. Between the caps the instantaneous shutter is placed, consisting of a metal disc with a hole of the same size as the barrel or exposure chamber, fixed on the end of a spindle passing through the cylinder.

On the rear end of the cylinder a second cap is fixed, with handle and mechanism for making the exposure. The handle is of the usual pistol shape, with a trigger at front. The spindle carrying the shutter engages with a spindle fitted to the rear cap, and capable of turning, having a spring and thumb piece to turn it into operative position.

To hold the spindle and shutter in this position, the spindle is provided with an arm which, when turned back, engages with the trigger. On pulling the trigger and releasing the arm, the spring above mentioned will cause the shutter to revolve rapidly and give momentary exposure to the plate.

Improved Devices for Mounting Photographs or the like.

No. 20,405. Maria Lake, 43, Scarsdale-villas, Kensington, London. *September* 29, 1894.

My invention relates to improved retaining devices for use in albums, scrap-books, and the like, or on handing cards, for holding photographs, scraps, or cuttings in position therein or thereon.

The chief object of my said invention is to provide means which will enable photographs, scraps, or cuttings to be retained in a more convenient manner than that afforded by the usual method of inserting the corners thereof in slits made in the page. This method is unsatisfactory, because it damages the page and renders the back thereof unsightly by reason of the protrusion therethrough of the corners of the photographs, scraps, or cuttings; and, furthermore, the said protruded corners interfere with the utilisation of that face of the page on which they lie, and, in the majority of instances, this face is therefore wasted.

The protruding corners of the photographs, scraps, or cuttings are, moreover, liable to be crumpled and spoiled by the turning of the leaves of the

album or scrap-book. According to my invention, to obviate the defects hereinbefore set forth, I provide pockets or receptacles of paper, thin cardboard, or other suitable material, and of triangular form, which pockets are adapted to be attached to the face of the page, or card, or tablet to receive the four corners of the photographs, scraps, or cuttings, and to retain the same securely, but in such manner that they may be very readily withdrawn or reinserted, as may be desired. I make the said pockets in the following manner, that is to say, I first cut the material into blanks of suitable shape, then fold the same and secure the folds in such manner as to form triangular receptacles, one face of which I coat with gum or other adhesive material, so that the said pockets may at any time thereafter be readily and firmly attached to the album or other material in or upon which they are to be used by applying moisture to the said adhesive material.

It is obvious that the said pockets may be applied and secured to the page of the book, or card, or tablet at any desired distance apart suited to the size of the photograph or scrap to be held thereby, so that there is no difficulty in accommodating scraps of all sizes. And it is also obvious that, if desired, the said pockets may be made of ornamental shape, and may also be ornamental on their faces in any desirable manner.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
12	Camera Club	*English Rural Scenery.* H. F. Knight.
12	Central Photographic Club	*Bromide Printing.* G. H. James.
12	Devonport	*Our Summer Outings.* R. Lamb.
12	Lantern Society	
12	Norfolk and Norwich	
12	North Middlesex	Lecture by G. H. James.
12	Putney	
12	Richmond	Discussion on *Toning Baths.* Mr. Ardaseer.
13	Birmingham Photo. Society	
13	Brixton and Clapham	*Exposure and Development.* J. A. Butler.
13	Hackney	*A Race through Western Norway.* A. Barker and W. F. Fenton-Jones.
13	Manchester Amateur	
13	Newcastle-on-Tyne & N. Counties	*Alpha Printing.* J. Brown.
13	Paisley	
13	Royal Photographic Society	
13	Stockton	
13	West London	
14	Croydon Camera Club	Photographic Chat.
14	Ipswich and Suffolk	
14	Leicester and Leicestershire	Demonstration: *Collotype.* H. Pickering.
14	Leytonstone	
14	Munster	
14	Photographic Club	Members' Open Night.
14	Southport	
14	Stockport	
15	Birmingham Photo. Society	
15	Camera Club	*The East.* T. M. Brownrigg.
15	Ealing	*Engelmann's Ideal Silver Platinum Paper.* W. Herzfeld.
15	Glossop Dale	
15	Greenock	
15	Hull	
15	Liverpool Amateur	Smoking Concert.
15	London and Provincial	*Development and Toning of Bromide Prints.* W. Ethelbert Henry, C.E.
15	Oldham	
15	Oxford Photo. Society	
16	Cardiff	
16	Central Photographic Club	*The Photographic Convention of* 1892 *and* 1894. Mrs. Catherine Weed Ward.
16	Croydon Microscopical	
16	Holborn	
16	Leamington	
16	Maidstone	
16	North Kent	
17	Hull	

PHOTOGRAPHIC CLUB.

OCTOBER 31,—Mr. Naegali in the chair.

Mr. Jackson, of Denver, Colorado, showed some of his exceedingly large panoramic views of American scenery. They were combination prints from four negatives printed on single pieces of paper, seventy-eight inches long, and varying in width from fifteen to twenty inches. A vote of thanks was accorded to Mr. Jackson for his kindness in bringing such marvellous results.

Mr. B. J. EDWARDS, referring to Mr. Alfred Watkins's paper at the previous meeting, thought members would be interested to see a few negatives and prints which, he ventured to think, would explain and confirm his remarks when he was distinctly opposed to Mr. Watkins. He considered that Mr. Watkins's experiments were very crude and misleading, and his conclusions quite wrong. His test plate was simply made by sticking pieces of tissue paper over a piece of glass quarter-plate size, so that the light had to go through varying thicknesses from one to ten. The negative plates used were of medium rapidity, and he had given enormously varying exposures. In the first case shown, after exposure behind the test plate, the negative was cut in two, one half being developed in a normal developer, and the other in a strongly restrained one. One half of the plate showed a thin, weak result, without gradation, while the other showed every gradation from white to black. He thought the members would admit that this entirely disposed of Mr. Watkins's argument. Other negatives and prints were shown to bear out his contention as to the great command the photographer had over results by selection of developers, one of the most striking results being the instance in which one plate received ten seconds and the other 240 seconds. By alteration in the developer, the two negatives appeared to have received identical exposures.

Mr. J. A. SINCLAIR said that, while he could not at this stage take any definite position, yet he could not help thinking that Mr. Edwards had not quite grasped what Mr. Watkins was contending for, and suggested that, to have been conclusive, the experiments should have been made on the grounds laid down by Mr. Watkins. Mr. Edwards, in developing the two halves of his negatives, had not carried the density to the same point. This Mr. Watkins regarded as most important, and without this no proper comparison could be made.

Mr. EDWARDS said that, if development had been carried on further in the halves complained about, only greater density all over would have resulted, and there would have been the same absence of scale.

Mr. SINCLAIR could not agree with Mr. Edwards on this point. He considered it quite probable that, with the developer used, all the tones had come up together, but that proper gradation would have resulted if development had been pushed on till the densities were the same in both halves.

Mr. MACKIE supported Mr. Edwards. He did not consider that photography was the mechanical process which Mr. Watkins would make it.

The CHAIRMAN said that we should hope to have the further experiments of Mr. Edwards by March 6, with a paper on the same subject.

Mr. W. I. CHADWICK read a paper, *Compressed Gas in Cylinders and Bags* [see page 712].

Being a Lantern Night, slides were shown by Messrs. Haes, Bridge, Hastings, &c.

Ealing Photographic Society.—November 1, Mr. H. W. Peal in the chair.—The lantern was manipulated by Mr. T. Simpson. A number of slides by members of the North Middlesex Photographic Society, kindly lent by the Royal Photographic Society, were shown, and were highly appreciated. About seventy or eighty slides by members of the Ealing Society—viz., Messrs. Dawson, A. Ernest Smith, W. G. Wagner, T. E. Crisp, the President, and the Hon. Secretary—were then shown; some of these slides were exceptionally good, notably Mr. Crisp's flower studies, Mr. H. W. Peal's seascapes, &c., and Mr. A. E. Smith's *Buffalo Bill.* Five new members were elected.

Hackney Photographic Society.—October 30, Mr. R. Beckett presiding.—Members' work was shown by Messrs. Roofe, Wilks, A. Barker, Rawlings, Fort, Gosling, Dean, Roberts, and Hudson. This being a lantern evening, slides were shown on the screen illustrating a lecture on *Popular Authors and their Work*, sent by Messrs. Newnes, Limited. Among others, portraits of the following authors were shown, and their works mentioned: Carlyle, Ruskin, Tennyson, Dickens, George Eliot, R. L. Stevenson, Rudyard Kipling, R. D. Blackmore, Conan Doyle, Besant, Grant Allen, Rider Haggard, Hall Caine, David Christie Murray, G. R. Sims, J. M. Barrie, S. R. Crockett, "Q," Zangwill, Mrs. Oliphant, Miss Braddon, and Charlotte Yonge.

Richmond Camera Club.—October 29.—Mr. Cembrano presided, and Mr. A. MACKIE gave *An Elementary Talk and Demonstration on the Principles of Emulsion-making.* The lecturer defined "emulsion," in its photographic sense, to be a viscous fluid holding in suspension a substance in a fine state of division, the emulsion he wished to treat of being formed of a haloid salt of silver held in suspension either in collodion or gelatine solution. He then formed bromide of silver by adding silver nitrate to a solution of potassium bromide, and explained the resulting chemical changes. The sensitiveness of an emulsion depends on the coarseness of the molecules of the bromide, resulting from the aggregation of a finely divided bromide by means of heat or treatment with an alkali, and the quality is influenced by a variety of conditions. Experiments were given to show how the progress of an emulsion was to be gauged by its colour by transmitted light, the bromide changing from ruby red to blue as the boiling of the emulsion and treatment with ammonia proceeded. The remaining steps of setting, washing, and remelting the emulsion, and coating and drying plates were then described, and a most interesting lecture concluded with a brief history of emulsion-making from its inception in the early sixties to the present day.

Woodford Photographic Society.—November 1.—A letter was read from Mr. H. W. Bennett resigning the secretaryship of the Society. It was unanimously resolved that the best thanks of the meeting be given to Mr. Bennett for the services he had rendered to the Society as Hon. Secretary since its formation, and a hope was expressed that he will be able to continue his membership. The new PRESIDENT (Mr. E. B. Caird) then thanked the members for the honour they had done him in electing him to that position, and spoke with pride of the good work the Society had done during its short existence, urging all the members, particularly the less experienced, to bring forward not only their successes, but their failures also, in the latter case enabling those of larger knowledge in favourite subjects to draw upon their stores for the general good. He congratulated the Society on the fact that at the end of the first year they should possess such a substantial balance as to justify the Council in purchasing a good portable optical lantern for use at the club meetings and for lending to the members for their private use. Final arrangements were made for the display of members' work for the past year, and the date fixed for November 24 from five to nine o'clock. Tickets for admission of non-members to be had from the Acting Hon. Secretary, Mr. H. T. Malby, Chelmsford-road, Woodford. Officers for 1894-5:—*President:* Mr. E. B. Caird.—*Council:* Messrs. H. Wilmer, H. T. Malby, E. Marriage.—*Acting Hon. Secretary and Treasurer:* Mr. H. T. Malby, 2, Blyden-villas, Chelmsford-road, Woodford.

Longton and District Photographic Society.—On November 1, Mr. T. Mottershead gave a demonstration on Alpha paper. He exposed and developed several excellent prints from negatives taken on the last excursion of the Society to Moddershall. Several questions were asked as to the best developer for bromide papers. The lecturer said he strongly recommended hydroquinone, having used it himself for a long time, and found it very easy and clean to manipulate. He had also round metol very good. A short discussion took place after the demonstration, and it was decided to hold an exhibition and *conversazione* in February next. The meeting terminated with a vote of thanks to Mr. Mottershead.

Dundee and East of Scotland Photographic Association.—October 30.—Mr. A. C. Baldwin, representing the Eastman Company, gave a demonstration of toning solio with the Company's new platinum bath. Before proceeding with the demonstration, Mr. Baldwin gave a general *résumé* of the Company's products, reviewing them in detail with specimens. For the development of gelatino-bromide paper be recommended amidol without bromide.

The second general meeting of the Session 1894-5 was held in Lamb's Hotel, Dundee, on Thursday, November 1. After routine business, twenty-four new members were elected. Professor Steggall, in one or two experiments, illustrated the action of a lens by making the path of the ray of light visible in water tinted with eosine. He showed that the action of a lens of air in water was exactly opposite to that of a glass lens of the same shape. A large number of photographic lantern slides were also shown, these being the work of Messrs. Scrymgeour, Crighton, Stewart, and Ireland. The result of the competition for a pair of views taken at the Society's excursions during the past summer was as follows:—1, Mr. V. C. Baird; 2, Mr. W. Bertie; 3, Professor Steggall. For the best set of four hand-camera prints the prize-winners were:—1, Mr. J. R. Stewart; 2, Mr. P. Feathers; and 3, Mr. Andrew Stewart.

FORTHCOMING EXHIBITIONS.

1894.		
November	9–14.....	*Royal Photographic Society. R. Child Bayley, Assistant Secretary, 50, Great Russell-street, W.C.
,,	12–17.....	Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,,	20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,,	21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,,	29, 30 ...	Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,,	23–Dec. 1	*Stanley Show (Photographic Section).
,,	27–Dec. 1	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,,	29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
December	3, 4.....	North Middlesex Photographic Society.
1895.		
March	25–30	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

COPYING PHOTOGRAPHS.

To the Editor.

Sir,—While thanking you for your valuable leader on *Enlargements from copied Photographs* (October 26, 1894), will you allow me to describe the way in which I made a very successful enlargement some time ago. The original was a *carte-de-visite* figure, ¾ length, surface of paper very rough (*i.e.*, the albumen broken up), and the photograph itself not sharp. Thinking it unadvisable to retouch on a sharp negative, as probably all likeness would have been lost, I hit on the idea to copy first a head and shoulder on a quarter-plate as a collodion glass positive, and when I enlarged from the latter to a four-and-half-inch head I was equally surprised at the results obtained.

If this should be of any use to others, it will in some measure repay you for the room taken up in your valuable paper, by that

Audacious Operator.

Nov. 1*st*, 1894.

"IS IT INJURIOUS TO HEALTH."

To the Editor.

Sir,—In connexion with your reprint of the statement of a contemporary on "photography" under the heading, "Is it injurious to health," I should like to inform you that there is a photographic establishment wherein the *employés* labour under difficulties quite as great as those described by the "depressed and low-spirited" assistant, who so frequently requires the stimulus of "a cup of tea."

In a room measuring about 11 ft. long by 6 ft. wide, and varying from 8 to 10 ft. in height, seven retouchers and spotters have to work. Three walls and the roof are of glass, rendering it necessary for the retouchers to keep their heads entirely covered with a black cloth, besides making it very difficult to spot, as the light comes from so many different directions.

In the winter this room (which would otherwise be intensely cold) is heated by a gas stove, which renders the atmosphere unbearable.

Another interesting fact from an *employé's* point of view is that the proprietor of the concern sits at another desk in an adjoining room, having full view of his seven assistants, so that, though they may faint in the fumes of the gas or shiver in the cold, they have not a moment's respite from their arduous employment.

It is a notorious fact that the dark rooms, printing room, &c., as used by a vast number of professional photographers, are utterly unfit for the production of first-class work, and certainly in no way conducive to the health or comfort of their *employés*.—I am, yours, &c., Hygiene.

Bristol, October 30, 1894.

[The writer of the above letter forwards us the name and address of the establishment he refers to.—Ed.]

UNPACKING AND REPACKING PHOTOGRAPHIC EXHIBITS.

To the Editor.

Sir,—May I call the attention of those whom it may concern to the loose way pictures are unpacked and repacked at photographic exhibitions. I have just seen opened a large case returned from a recent "show." How the picture escaped being smashed up is nothing short of a marvel. A more shameful state of things I never saw. The picture was simply thrown into the case. Every care was taken to simplify the unpacking and repacking. The lid was put on with screws, and the picture screwed to the bottom of the case, with two screws from the outside through to the back of the picture-frame, the whereabouts of the screws being denoted by a large black cross. Thus by simply loosening these the picture was free. Instead of doing so, the frame was wrenched away, and the two screws holding it twisted in half. When I tell you these were two inches long, you may form some idea of the force necessary to break them. These were returned still sticking into the frame, the lid reversed, new holes made, and, as I have said before, the picture thrown into the case. Should a smash occur, the only redress one has is to sue the carriers, as the committee exempt themselves from all responsibility by a clause in their conditions to that effect. This is unfair to the carrier, as in very many cases the fault is the packer's. One is at all times ready to assist clubs in making their shows a success. In return, is it too much to ask that ordinary care should be given to works loaned to them?—I am, yours, &c.,

C. E. W.

GLYCIN-HAUFF FOR DEVELOPMENT OF COLLODION PLATES.

To the Editor.

Sir,—In our last letter on above subject a clerical error occurred; we should have said "Glycin-Hauff for Development of Collodion *Emulsion* Plates." Kindly correct this, and oblige.—We are, yours &c.,

Fuerst Brothers.

Philpot-lane, London, E.C., November 5, 1894.

MR. GOLDING'S PICTURE.

To the Editor.

Sir,—I notice in the last issue of your paper a criticism by Mr. W. S. Bird on my picture, *Where Sea Meets Land in Daily Strife*, now exhibited at the Royal Photographic Society's Exhibition, and ask you to allow me to protest against what therein is suggestively inferred, viz., "That it is suspected of having been helped by hand."

I wish to state that neither the negative nor the print has been touched with the exception of spotting. This doubt was mentioned to me at the opening *conversasione*, and I afterwards placed the negative in the hands of Mr. A. Horsley Hinton, and I append what he has written upon the matter in the present issue of the *Photogram*:—

"Mr. Golding's picture, which has deservedly received one of the Society's medals, has been unhappily criticised in the reports of certain of our contemporaries, including a London daily, which says of this print: 'There are strong symptoms of considerable painting on the print in portions which contribute largely to the effect of the picture.' Whatever 'symptoms' may be here referred to, they have evidently misled the writer. I have had the original negative in my own hands, and am prepared to vouch for the print being an exact print from the negative, which is an exceedingly fine one, and there is no painting on the print beyond the spotting out of one or two minute defects in the sky. It is a pity that Mr. Golding's undoubted success should be in any way discounted by a question of genuineness."

Should further investigation be considered necessary, I am agreeable to any course Mr. Bird may suggest.—I am, yours, &c.,

116 *Mercer's-road, Tufnell Park, N.* Arthur J. Golding.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange full-plate camera, seven slides, case, and tripod, for enlarging lantern, eight-inch condenser.—Address, D. GORDON, Photo, Cupar, N.B.

Wanted a whole-plate rapid symmetrical lens (Ross) in exchange for a B 1 Dallmeyer's long studio lens.—Address, N. WEBB, The Green, Calne, Wiltshire.

Will exchange a good half-plate camera and one double dark slide for a three-fold tripod.—Address, W. COPE, 16, Stanley-street, Fairfield, Liverpool.

Wanted, Lancaster's or other maker's enlarging camera in exchange for backgrounds or accessories.—Address, A. D. HOYLES, Artist, Bourne, Lincs.

Wanted, odd or consecutive numbers of the *Sketch* in exchange for photographic materials.—Address, EDWARD NORTON, Wells, Somerset.

Will exchange, for an exterior or interior background, an alto-relievo background cost 27*s.* 6*d.*—Address, ALEXANDER BETTS, Photographic Studio, Prospect, Swindon,

Will exchange large rock, cost 24*s.*, for grass mat or microscope.—Address, GEORGE MOORE, Buckfastleigh, Devon.

Wanted two 40-feet cylinders, with Beard's regulators: will give in exchange Coventry tricycle, two track, tangent wheels for two riders, cost 24*l.*, or offers in slides.—Address, F. WRIGHT, Photographer, Northampton.

Will exchange Marion's enlarging lantern, 8-inch condenser, 3-wick lamp as new, and Marion's No. 1 registered print-washer for Marion's 2-back smoking chair, fig. S and fig. O.—Address, ARTHUR WHETTON, Post Office, Deddington, Oxon.

Achromatic microscope objective (combined 1-inch, ½-inch, and ¼-inch), will exchange for ¼-plate rapid rectilinear or similar lens, *f*-6 preferred.—Address, G. E. Whiting, 33, Shirlock-road, Mansfield-road, London, N.W.

Will exchange an alto-relievo background, in perfect condition, value 1*l.* 7*s.*, for a good interior or exterior background.—Address, A. BETTS, Photographer, Swindon.

Wanted to exchange a 7-string banjo, 24 brackets, in American leather case, for half-plate camera, with or without lens, or a hand camera.—Address, J. COX, 26, Edward-road, Clarendon-park, Leicester.

Wanted, half-plate field camera (good make); or a quarter-plate portrait lens (by good maker), in exchange for fourteen vols. *Photographic News*, 1875 to 1888.—Address, W. J. WATSON, 3, Lower-terrace, Notting Hill, W.

Fifteen by twelve-inch view-lens in conical mount, set of stops in morocco case, by Wray, quite new, for good magazine hand camera or astronomical telescope.—Address, P. I. LAMBERT, 2, Railway-avenue, Malahide, Co. Dublin.

Stephenson's binocular dissecting microscope by Swift, with two-inch, one-inch, and half-inch objectives by Crouch, in brass boxes, Webster's condenser with iris diaphragm, two live boxes, &c.; will exchange for Dallmeyer's tele-photo (compound) lens in aluminium, to fit Ross' half-plate camera.—Address, J. ELLIOTT, 4, The Beacon, Exmouth.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

*** Several answers to correspondents unavoidably held over.

W. GIRLING.—1. The address is G. Wheeler & Co., Manchester. 2. The book has not yet reached a second edition.

A. B. C.—1. You could not do better than the bromide process and ferrous oxalate for development. 2. We are not acquainted with any gelatine ferrotype process.

ANTHONY PERCIVAL.—The photographs sent are generally excellent, and do not show evidence of under-exposure. We do not think it advisable to publish your letter.

M. E. C.—No after fixing is necessary. It depends upon how the finger marks are caused as to whether they can be removed. Kindly supply this information, and we shall then be able to reply.

H. H. H. CAMERON.—Any work on collotype will give the desired information. It has been frequently dealt with in the back volumes of the JOURNAL. Any old works that deal with the Pretsch, and similar processes, will afford information.

O. S. (Brighton)—We have never heard of the material in question, nor can we find it mentioned in any list in our possession. We strongly surmise that there is some mistake in the name or in its translation.

NON PLUS.—Stationers' Hall, London, E.C., is a sufficient address. The search will have to be made by yourself, or by some one employed on your behalf. The Company do not undertake to make searches, although every facility is given to others to do so.

W. S. (York).—The photograph of the Minster is good, but it would have been much better had the sun not been shining directly on the front, so that there are no cast shadows to be seen that would have produced relief. Try again taking the picture earlier or later in the day.

H. BRERETON.—Mr. Birt Acres has read a paper on the subject that has been published in the *Photographers' Record*. Write to Messrs. Elliott & Son, Barnet, to send you a copy of the number in which it appeared.

T. SYMONDS.—Although wire gauze may assist in crude experiments, and good results have been produced with it, we should certainly advise you to get a modern ruled screen or two. They are expensive, it is true, but they will be cheaper in the end than wasting time over wire gauzes, &c.

T. C. B.—Common resin dissolved in a mixture of oil of lavender and turpentine makes a very good retouching medium. As a matter of business, those who make this material commercially do not publish how they make it; therefore we cannot say how the one that so much meets your approbation is compounded.

G. E. WHITING says: "Can you inform me where I can obtain 'zenotype powders,' mentioned in your JOURNAL a week since? No London dealer seems to stock them yet, neither can I persuade them to do so, or to give the maker's address."—The address is the Zenotype Company, 24, James-street, Liverpool.

A. L. SMITH.—There are now various books in which photo-mechanical printing is treated. Burton's *Printing Processes* is one of these. Wilkinson's book is more exclusively devoted to it, and a work by Julius Verfasser entitled *The Half-tone Process*, recently published by Percy Lund & Co., also gives all the information necessary to enable any one to practise photo-engraving.

G. T. (Bedford).—The firm in question is not now in existence. Any of the "white fires" in receipt books, or those given in books devoted to pyrotechny, will answer quite well. Whatever formula may be selected, great care is requisite in compounding it. The ingredients should be thoroughly dried and pulverised separately, then intimately mixed on a sheet of paper with a bone spatula.

T. STEVENS says: "The platinotype process is said to be a permanent process, but only a year ago I made some prints by it, and the skies are now quite of a yellow tint. Can this be called permanent?"—Yes; the prints are permanent; but, from careless manipulation, the iron was not removed, and it has caused the yellowing. If the prints be treated with dilute hydrochloric acid, the yellow will be removed.

H. S.—The spots are due either to grease or air bells in the gelatine. The remedy for them is obvious. The streaks are probably due to the temperature of the gelatine solution not being adjusted to its viscosity, or the machinery may not be of the proper kind, or, possibly, a combination of these circumstances. It is not usual to mix anything with the gelatine, and, as a rule, it is applied warm. Probably it would save you expense if you obtained advice from some one practically familiar with this kind of work.

C. JACOBS.—Evidently you have made a mistake in buying the residues without having a sample of them assayed first. We are not at all surprised at the return, considering how photographic paper is now prepared. That weight of residue at the time referred to would have been worth ten to fifteen times what has now been realised. As you bought it at your own price, you can have no remedy against the photographer who sold it, unless, indeed, you could prove a fraud in the transaction—a condition you do not suggest, and one that is not at all probable under the circumstances.

INTERIOR says: "I want to take the interior of a church, but the window over the altar being composed entirely of white glass makes such a glare in the chancel. Is there any means of avoiding this difficulty? It is not possible to cover the window during part of the exposure. Shall be glad of an answer."—As the light from the window cannot be subdued, the best way will be to take the photograph late in the day, when the sun is approaching the west and the light is feeble in the east, which the window, doubtless, faces. Use thickly coated plates, that have been backed.

OLIVER GARSIDE.—We really cannot understand your query, it is so "mixed." If the first part of your letter is a copy of the agreement, which seems to be somewhat contradictory in itself. As to your being allowed to copy the photograph, you do not say anything as to who holds the copyright, or if there is one. It is impossible to say to whom the negative belongs; probably to the photographer who took it, unless an agreement to the contrary was made. We cannot say what it would cost to break the agreement—that will be a point for a court of law to decide, as the agreement, as quoted, does not specify any definite pena lty as damages.

LEGAL INQUIRER writes: "Could you kindly inform me how the law stands respecting case as follows: On my printed price list I give three whole-plate groups for a guinea. A customer has three very excellent finished proofs; rejects them; a receipt is given; two others are supplied with the same result. Can I not summon for the guinea, and recover?"—Our correspondent can certainly summon for the guinea, but whether he will recover it will rest with the Judge who tries the case. Probably the defence will be that the portraits are not good, and that will be for the Court to determine.

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DISSOLVING VIEWS BY THE STEREOSCOPE.

The effectiveness of dissolving views is well recognised. They have hitherto been confined to the exhibition of pictures by the lantern, but such are tame compared with the dissolving of one stereoscopic view into another.

Stereoscopic dissolving views are very rarely, if ever, now come across unless it may be in the collection of a few of the *cognoscenti*, and these rather on the Continent than in this country. They had just been introduced, and were beginning to be appreciated, when the cloud descended in which the whole system of stereoscopiscity was enshrouded, although only for a time, as we now know. The solidity of an image in the stereoscope conduces to the superiority of the effect when a pair of flat pictures are made to dissolve one into the other in the optical lantern. In the case of interiors, we see chairs and tables getting gloriously mixed. Some one article of furniture will be seen to slowly plant itself in front of some other article; pictures on the walls become at first hazy, and are then found to be fast being supplanted by others; Ariadne and her tiger are being deposed by Una and the lion, and Hercules fades into nothingness as Cæsar advances. All this must be seen to be adequately appreciated. And besides—and in this lies a strong point of vantage—all this may be seen at one's own fireside, free from the trouble and fuss of having to unlimber and fit up a pair of lanterns by which to have them projected on a screen.

A dissolving stereoscope may be fitted up so as to form an elegant addition to the *bric-à-brac* on the parlour table or drawing-room window, and, when constructed as a thing of beauty, it will emphatically prove a joy for ever.

As yet they are not procurable in commerce, but let a demand once arise, and they will take a place among the supplies of every dealer.

To aid in their coming, we will now give an account of the principles involved in their construction, and in doing so will assume that the slides are printed as glass transparencies.

Speaking in general terms, the principle of the dissolving stereoscope is this: A slide is placed behind, in a closed stereoscope, and in the usual position for examination, and a second slide is placed above or below, the top being cut open. While the slide at the back is being examined, a silvered reflector, standing at an angle of forty-five degrees, between the eye-pieces and the picture, is slowly lowered or raised until it cuts off the direct view, and shows only the slide which lies on the top of the instrument.

This, we say, is the general principle, but departures may have been made in working out details. For example, we have mentioned a silvered reflector for effecting the change in the direction of the rays; but we have known of the reflector not being silvered at all, but consisting merely of a small sheet of plain patent plate glass, the surface of which, standing at the slope it does, reflects sufficient light to enable the second picture to be seen with sufficient distinctness and under conditions of sufficient luminousness. When a stereoscope is made with a simple reflector of this nature, very little work indeed is entailed in its construction. The whole work of dissolving is then effected by a pair of flap shutters outside of each picture, by which the light is cut off, and thus cannot enter the stereoscope. Upon making a trial of this plain glass reflector, we find that, when all light from behind is debarred access, and the inside of the stereoscope well blackened, its reflecting power is very considerable, and quite enough to show the upper picture with a fair degree of brilliance. It possesses this further advantage, that, when the light from the upper picture is shut out, the direct picture behind is seen with quite as much seeming brilliance as if the sheet of plain glass were not interposed between the eye and the slide.

The act of dissolving with a fixed plain glass reflector such as described consists in having the respective flap shutters which cover the transparencies on the outside geared together by a metallic strap or rod, so that, when one stands quite open, the other is entirely shut, and *vice versâ*. By the same movement which opens the one, the other is closed. The mechanism involved in this is far simpler than might appear from reading this description, and is not for a moment to be compared with the far greater drain on one's mechanical skill involved in the construction of even the simplest of our modern hand cameras or shutters.

But the refinement of this system consists in having the reflector composed of platinised glass—that is, glass which has had a very thin coating of platinum given to one side and then vitrified. Previous to vitrification, the platinic deposit should be thinned away at one margin so as to merge gradually into clear glass. By this means, and by a slight movement of the reflector up and down, the acme of perfection in the reflecting portion of the screen may be had in the one portion, and perfect transparence in the other. We have tried this with silvered glass, and it answers surpassingly well; but, when by

the action of the atmosphere it becomes stained, the silvered surface gets quite damaged after being cleaned a few times, whereas vitrified platinum will resist hard rubbing for a protracted period. Hence our preference for a platinised surface. We believe that the means for effecting this coating of platinum are to be found in a previous volume of this JOURNAL.

The slides are inserted in the stereoscope in the usual way, but we have seen an instrument into which they were inserted automatically by a species of clockwork, and by which the dissolving flaps were also operated at the fitting moment. This last-mentioned device was, we believe, the invention of M. Hubert Desvignes. In an instrument of this automatic nature we once saw, it was possible to sit before it, examining the pictures as they dissolved one into the other, without so much as the necessity arising for moving one's hand from beginning to end of the whole series.

It need scarcely be said that the upper one of the two pictures being exhibited in the dissolving stereoscope must be inserted in the reverse way from that which is to be viewed direct.

A RESUSCITATED CARBON PROCESS.

LAST week, in a short leaderette, we briefly referred to the revival of a primitive process of carbon printing, generally known as Pouncy's process. In the paper that he read at one of the Salon Conferences, Mr. A. Maskell made the remark: "By the diligent and, I may almost say, 'historical,' student of THE BRITISH JOURNAL OF PHOTOGRAPHY, I am pretty sure, I suppose, to be met with the usual reference to such-and-such a page of such-and-such a year ever so far back, and, if this epitome of photographic information is able to call my attention to many instances where the subject has been referred to, I can only say that my astonishment is the greater that practical results have not ensued in this country, which is famous for its photographic research." Now, it is highly advantageous that such references can be made, and chapter and verse quoted, as otherwise some, like the author of the paper, might unwittingly be the means of promulgating a process or thing as new if it merely happened to be a novelty to them, and, by giving the idea publicity, it might be perpetuated as a fact in after-years. The present, indeed, is a case in point.

In referring to the "Artigue" method, the reader of the paper says: "It is, I think, astonishing, that this fine process should have been in existence since about 1884, and that we should here still be almost entirely ignorant concerning it." As a matter of fact, this process was in existence a quarter of a century before the date quoted. It is also stated that Pouncy's process was first published in 1869. At that time, it may be mentioned, the carbon process (Swan's), had been worked commercially for several years. We have in our possession now the presentation print for 1866 (15 × 12), of the old South London Photographic Society, which is in carbon, and it was printed by Mawson & Swan. Pouncy lodged the provisional specification for a patent, in which the process was, of course, given, early in 1858, and he again described it at the January meeting of the London Photographic Society in 1859.

The reason why this process and the reintroduced one of 1884 lay dormant so long, is we surmise, that until recently the so-called "impressionism" phase of photography did not exist, and photographers, as a body, required, in their prints, all the delicate half-tones and fine details they were able to obtain in their negatives. They would adopt no process that d not yield them. The author of the paper, amongst oth things, says, "Incidentally I should like to throw out the su gestion of the use of bitumen instead of bichromate and gun It may be dissolved in benzole, and intimately mixed wit lithographic ink or other greasy colouring matter; coated o thin paper and printed through the back, the development ca be effected with benzole or turpentine." Is this not precisely i every respect also one of Pouncy's methods of working, and fo which he obtained a patent more than thirty years ago namely, in January 1863? During the Cantor Lectures, de livered at the Society of Arts, in 1878, by Mr. Bolas, we re member quite well that gentleman developing a picture in half-tone, in bitumen, spread upon talc, and exposed from the back, which was afterwards projected by the lantern on to the screen. Although the solution of bitumen used for the work was the Brunswick black of the shops, the transparency was quite as good as could be produced by any other process.

In the paper read at the Salon great stress was laid upon the fact that with the carbon process, as described, effects could be greatly modified during the development by mechanical means, such as by the use of a brush or by a stream of hot water. Surely there is no novelty here, either as applied to the primitive process or to that of the process at present worked. In the earlier days of Swan's process a camel's-hair brush was generally at hand during development, and was freely used, and we are informed that in Continental establishments, where the reproduction of works of fine art in carbon is carried out on an extensive scale, a brush is still in constant use to secure effects that obtain in the originals, and which photography has not sufficiently emphasised in the negative.

When we visited the Autotype Works, now many years ago, we saw what we think was called the "water brush" in use. It was merely a strong jet of hot water, which the operators dextrously regulated the force and size of by simply pinching the end of a piece of rubber tubing fastened on the hot-water taps. By this simple contrivance the water could be projected as a very fine or a thick stream, with either great or little force, or almost as a fine spray. By this means effects were, and no doubt are still, modified to any desired extent. As most people are aware, it is the extreme control one has in obtaining "effects" that constitutes one of the principal advantages of the carbon process. Of course, with the primitive process referred to, this is more restricted than in the one in general use.

We have considered it necessary in this instance, as in many others, more especially as we were quoted as an authority on such matters, to direct attention to what is often brought forward in modern times as new processes or inventions, which are not only not new, but are sometimes some of the oldest of old processes. The one now before us is a case in point. It was the lack of knowledge of what had been done before that led an Hibernian inventor to exclaim, "Confound those ancients, they have stolen all my new ideas!"

After dealing thus briefly with some of the historical points of the process described at the late Conference, we had intended to say something about the conditions necessary to obtain the best effects by working without transfer, because, as we intimated last week, that method is capable of producing fairly passable results, and that the late Mr. Pouncy had done so, although the demonstration at the Salon did not show its capabilities to the best advantage. Pressure of other matter, however, necessitates its being deferred till another occasion.

Death of C. G. H. Kinnear.—We are sorry to have to announce the sudden death of Mr. Kinnear, of Edinburgh, a gentleman whose name is so intimately associated with the Kinnear Camera, of which he was the inventor. Professionally, he was an architect of high eminence in Edinburgh. He was an Associate of the Royal Scottish Academy, and also Colonel of the Midlothian Volunteer Artillery, being the oldest volunteer artilleryman on the active list in Scotland. When, in 1856, the now non-existing Photographic Society of Scotland was formed, under the Presidency of Sir David Brewster, Mr. Kinnear acted as Hon. Secretary for several years, and it is probable that his retirement from that office had more to do with the demise of the Photographic Society of Scotland than the formation of the Edinburgh Photographic Society, which was established in 1861 on more popular lines. We had a visit from Colonel Kinnear only a short time ago when he was up in town, and found that his love for photography had suffered no diminution, but that he was, if possible, still more attached to it than ever. He was at business in his own office on Monday, the 5th instant, and went home for dinner apparently quite well, but suddenly died from heart disease between five and six o'clock that same afternoon, in his own house, in the sixty-fourth year of his age.

New Outlet for Photographic Fever.—Such was the suggestion of a well-known contributor the other day, in pointing out a photograph in last week's *Nature*. "Every one," he said, "has a camera, and a great many camera-owners have a baby. Let them advance the cause of science by photographing the youngster as he is endeavouring to progress before he has learnt the upright position." Seriously, it has been attempted to found a physiological, or rather ethnological, theory upon the mode a young human being progresses in its early stages. We say progresses advisedly, for it appears they do not all "crawl," for the photograph in *Nature* shows the infant getting along in quadrupedal fashion, and not using "its" knees at all. It may be noted that we say "its;" all photographers accustomed to the ways of mothers and their babes know it is a terrible thing to speak of a babe as "it." Our use of the word is a strict quotation.

Art Criticism, Past and Present.—The following is a choice bit of early criticism of a picture by the late J. M. W. Turner:—

"The Field of Waterloo (or anything else), J. M. W. Turner, R.A. It is really astonishing how Mr. Turner could not see that this daub of real and unpardonable nonsense cannot be called a performance worthy of the pencil of an Academician. Recipe: Take a rough canvas, or anything else, brush away with all the mingled colours of a mad pallet, as they come; keep a place or two filled up with yellow, red, and blue, and call it anything."

Although this was written very early in the century, it seems to be not altogether inapplicable to some recent photographic reproductions. But Turner's genius survived this and a great deal more severe writing, so that Mr. Rowland Bryant, Mr. Davison, and Mr. Maskell may take comfort, and calmly wait for the dawn of a more appreciative criticism.

A Dangerous Water.—The quality of the water supply made use of by photographers is known to have an important bearing on results, excess of lime and iron being the impurities usually considered most influential in their effects on prints or negatives. But the photographers of Eccleshill, according to the statements of the *Medical Press*, have a still more subtly dangerous substance to deal with, the Medical Officer of Health for the district having reported that the water supply of the neighbourhood contains no less than one sixth of a grain of lead per gallon. This proportion, which would be a mortal danger to health, would undoubtedly be injurious to photographic operations; hence for the future, when utilising a new water supply, photographers would do well to test it for lead by adding a drop or two of this chemical (once greatly in vogue as an intensifier after mercury), hydrosulphate of ammonia. The slightest trace of lead would show a discolouration of greater or less depth according to the proportion present.

Temperature Measures.—Though there are not many operations in photography requiring excessively close accuracy in thermometer-reading, it is yet well to have some idea of the extent to which accuracy may be carried. Hence the paper by the President of the London University College Chemical and Physical Society on this subject is worthy of a note. He reminds us that the zero of a thermometer gradually rises after the instrument is made, and that in the best kind three years are needed before this zero becomes fixed. It will thus be seen, that of two equally well-made thermometers—one old, the other new—it would be quite possible for an important difference in their readings to exist without real detriment to their value, so long as the existence of the error was known. So well known is this fact, that, when a thermometer is sent for verification to Kew, the printed certificate contains a recommendation to have it verified afresh after a lapse of time. The actual limit of exactitude obtainable with a thermometer is, according to the authority referred to, the one-thousandth of a degree. Professor Langley's bolometer, which is an electrical instrument, is sensible to the millionth of a degree. Perhaps the latest addition to thermometer novelties is one which reads up to 600°; the liquid in it is an alloy of sodium and potassium.

Incandescent Lights.—The important position now taken by gas as a photographic illuminant when used in incandescent burners gives special interest to a note recently presented by M. Croon to the Paris Academy of Sciences. He finds that, though the greater the amount of gas burnt the greater the increase of luminosity per foot of gas jet, the less the degree of incandescence. With gas lights of this kind, the greatest amount of light corresponds to the least amount of the combustible consumed to produce maximum possible incandescence. Every one familiar with the burners of this type, founded on the original Welsbach burner, is aware of the important improvements recently made in them. The mantle-holders are entirely redesigned, and no longer resemble the work of a second-rate blacksmith, and the mantles themselves, while greatly improved in tenacity, are at the same time considerably reduced in price. We may give a valuable hint, bearing on M. Croon's researches, in the use of these burners. We have found that, when there is a strong pressure of gas at the burner, there is actually less illumination—not to speak of the injury to the mantle—than when a lower pressure is adopted. Hence, by turning down the gas by means of the ordinary tap, it is often possible, while diminishing the consumption, to increase the illumination from thirty to fifty per cent.

NEW DEVELOPMENTS IN PLATINUM TONING.*

In the next series of make the prints were fixed before toning, but the results obtained in this manner were so precarious and uncertain, and the time occupied in the toning so protracted, that I relinquished the attempt in disgust. The redevelopment of the unfixed prints did not appear to offer any very great prospect of success, until I bethought me of the recently introduced system of developing partially exposed printing-out papers; but, when I immersed one of the toned and unfixed prints into a twenty-grain bromide solution, and it disappeared almost completely, I nearly gave it up as a bad job. This print, however, was rinsed and placed in an old solution of metol that had been used for negative purposes, and I was, I must confess, considerably surprised, on returning to it in two or three minutes' time, to find what looked like an underexposed, rather hard and dirty platinotype or bromide.

The darker portions of the image were vigorous and rich in colour as a fairly good platinotype, but the higher lights were bleached

* Concluded from page 709.

and eaten away, and the whites degraded and dirty. These defects might, no doubt, be lessened or altogether be got rid of by a proper adjustment of the proportions of the platinum salt and the bleaching agent. Indeed, I did subsequently secure fairly passable results by making the toning process slower, using a less quantity of the bleaching agent, and so giving the platinum a better chance of acting.

Of the bleaching agents tried, cupric chloride gives the best apparent result so far as tone is concerned, I mean in range of colour and warm tones; but, as I have already said, this all disappears afterwards, so it is of no value. The iron salts give less trouble in getting out of the paper, and are therefore to be preferred if any one wishes to try the process. After or before development a weak acid clearing bath should be used, to get rid of the iron, and after proper washing the prints are fixed in the ordinary way.

Personally, I am not greatly enamoured of black tones, especially on paper with a gloss, otherwise I might be disposed to go further with this process; but, as it is, I have other things to attend to. Platinum toning I firmly believe to be the thing for gelatino-chloride, and I may mention, in conclusion, how quite accidentally, in the course of these experiments, I hit upon a "wrinkle" which promises, if it has not done so already, to put platinum in a better position than gold. There is one very important point in connexion with it, namely, that the acid solution of chloro-platinite of potassium is a stable one, and not like the alkaline gold bath, in a state of uncertain equilibrium that predisposes it to go wrong on the slightest pretext. The platinum bath, if sometimes slow, goes on regularly until exhausted without any tendency to turn pink itself or make the prints do so. It is also more economical than gold.

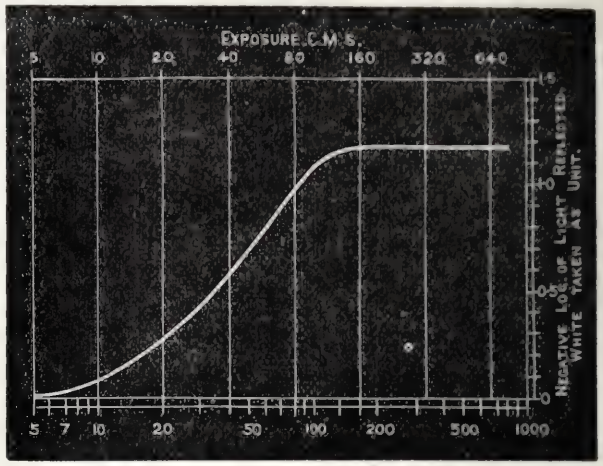
Therefore I congratulate myself upon the accident or, rather, carelessness that made me put some untoned prints into the bromide solution, instead of into the toning bath. The bromide was pretty strong—twenty grains to the ounce—and the prints were not overprinted to any great extent, and, after two or three minutes' immersion, there did not seem to be much picture left. Some little time back I tried the experiment of soaking gelatino-chloride prints in bromide solution, instead of salt, before toning with gold, and the result was not a success, so I did not hope for it here, though I washed the prints and passed them into the platinum bath. The results were more than satisfactory, for, although the action was rather slow, I have never seen better tones or better behaviour with gelatino-chloride paper either with gold or platinum.

Though the experiment was the result of an accident, the results themselves were not so, as I have repeated it and also varied it by adding bromide of potassium to the toning bath, instead of salt, and in every case I have had the most satisfactory results.

W. B. Bolton.

THE PRINCIPLES INVOLVED IN ENLARGING.*

I do not propose to say anything about the way in which we measure the densities of our negative. With this you are all more or less familiar, many of you having seen the operation carried out at a previous meeting; but we must go into the question of what may be taken as the range of bromide paper generally, and there is probably no material difference in the ranges of various papers. In order to decide this range, we made a series of exposures on a strip of bromide paper. On examining the gradations after fully developing out, we found that the extreme range did not coincide with that negative range which gave the best practical result; the paper range, looked at in this way, was too extended, and an enlargement from a negative of a similar extended range produced a result of a strongly pronounced chalk and soot character, with which we are only too familiar. In order to discover the cause of this discrepancy, we measured, by reflected light, the gradations of the paper strip. For this purpose we employed a modification of our photometer, which I will not now occupy time in describing. Suffice it to say that we obtained a reading from each gradation. The reading, however, in this case does not express density, but the fraction of light reflected by the gradation as compared with light reflected by the normal white of the paper. A reading of 1·3 (log. 20) indicates that the gradation reflects $\frac{1}{20}$ of the light reflected by the pure white of the paper. Having measured the gradations of the entire strip in this way, we proceeded to plot them just as in the case of the densities of a speed determination. This diagram shows you the



result, and you will at once see the strong resemblance of the paper scale to the "characteristic curve" of a plate; but I want to call your attention chiefly to the upper part of the curve. In the case of a plate this would merge from the straight line of the "correct period" much more gradually, but here you see that, when the ordinate 160 is reached, there is no further measurable difference in the degree of blackness, so that, though exposures beyond 160 C.M.S. have produced slight differences just discernible to the eye, comparatively large density differences in the negative would be represented by such trifling differences in the paper scale that we have simply to ignore the latter. The same argument applies to the very faintest indications of deposit at the other end of the scale, so that you see the practically useful range of the paper is less than a mere inspection of the gradations would lead one to infer. And you must remember that our test strip was practically developed out, while in picture-making this is generally not the case. This diagram, therefore, teaches us that the practically useful range of bromide paper is capable of recording light intensities which are to each other as 5 : 160, or as 1 : 32; or, taking the difference between the logarithms of these numbers, in order to compare directly with the negative densities, we at once learn that the density range of a negative suitable for enlargement must not exceed 1·5, and, as a matter of practical experience, a somewhat less range gives even better results. An examination of this diagram further teaches that, as the more delicate intermediate tones of the negative correspond with the higher part of the paper curve where the gradations approach each other very closely, the small negative gradations should be kept as wide apart as possible. This means that a negative for enlarging should be fully exposed, so as to bring its lower densities into the period of "correct exposure."

My reason for preferring a negative with a rather too contracted rather than a too extended range is that I think it far better to make quite sure of getting my delicate half-tones, even at some loss of the deepest black tones. In the finished print it is easy with the brush to strengthen the deepest shadows if desired, but it is a much more difficult matter to fill in half-tones which are wanting, and I need hardly point out the importance of taking all possible measures to reduce the necessity for hand work upon the finished enlargement to a minimum.

We have now considered the range a negative ought to have for the purpose of enlargement, and we have seen that the negative ought to be fully exposed. I also told you that a negative suitable for contact printing is utterly unsuited for enlarging. As most of our negatives are, however, specially taken for contact printing, the question arises what course we are to take if we wish to produce enlargements from them also? The answer is, we must make reproduced negatives having the density range we require. Fortunately this is an easy thing to do, and I will indicate my own method of procedure. I first of all produce, by means of the camera, a transparency on a slow lantern plate, having all the qualities of a good lantern slide. From this again, also by means of the camera, a new negative is made on a similar slow plate. The chief things to attend to are that the exposure for the new negative is decidedly ample, and that development be stopped very early, as soon, in fact, as detail is generally visible by reflected light. By taking these two courses, we shall have no difficulty in procuring that narrow range, combined with adequate detail, which are requisite in a negative for

* Concluded from page 715.

the purpose of enlarging. With the plates I generally use I find that, if the exposure has been correctly timed, a development extending over from one to one and a half minutes at a temperature of 65° Fahr. will yield a negative having about the right range for the purpose of enlargement. I have purposely specified slow plates for the production of the transparency and the reproduced negative, because the grain of the deposit on a slow plate is much finer than on a rapid plate, and, of course, we must do all we can to obviate texture. It is perhaps hardly necessary to call attention to the importance of exercising the utmost care in the production of the transparency and the reproduced negative. They must be clean, and as absolutely free from faults of any description as possible, because it will be obvious to you that the enlarged print will bear the impress of any faults which may collectively exist in the original negative, the transparency, and the reproduced negative. But, on the other hand, to one expert in the use of the pencil or brush the removal of blemishes, and retouching generally, is assisted greatly by having three plates to work upon.

I now propose to show you a few negatives and rough unfinished enlargements produced from them, and I think you will agree that they bear out what I have said with regard to the production of half-tone. Here are five different portrait negatives of the same sitter, all as nearly as possible exposed for the same length of time, but the time of development varied in each case. The times of development were respectively one and a half, two, two and a half, three and a half, and four and a half minutes. You will see how the general density of the negatives increases from No. 1, a mere ghost, to No. 5, a strong, brilliant negative. I have marked upon these negatives their respective enlarging ranges, which, you will see, are 0·95, 1·37, 1·82, 2·19, and 2·37. Now, from what has been said, you will have no difficulty in deciding which of these five negatives we must take if we want to produce the best enlargement. The only question is, which range is nearest, but does not exceed 1·5? This you will find to be No. 2, the enlarging range of which is 1·37. No. 1 has a range of 0·95, which is too contracted; and the range of No. 3, which is far too extended, and would never produce a pleasing result. I now show you two enlargements produced from negatives Nos. 2 and 3. You will at once see that No. 2 has produced a print full of half-tone, while the print from No. 3 is almost devoid of delicate intermediate tones, but has the well-known chalk and soot character. You may, therefore, easily imagine what an enlargement would be like made from negatives Nos. 4 and 5; yet even No. 5 would yield a good contact print. We thus see that totally different negatives are required for the two purposes. I now hand round a negative, which I must ask you to take special care of, as it has some historical value to me. It has an enlarging range of 1·218, and it was produced about four years ago in order to confirm a conclusion Dr. Hurter and I had arrived at, on purely theoretical grounds, as to the special quality of negative required for enlarging purposes. While it is capable of producing a good enlargement, as you will see, you will, I am sure, at once agree that it could, by no possibility, produce even a passable contact print. I next show you a negative and a contact print taken from it. The print shows the negative to have about the right range for a contact print on bromide paper; but, as the enlarging range of the negative amounts to 1·95, you will see that it could not possibly yield a satisfactory enlargement. Wanting an enlargement from it, however, I had to make a reproduced negative, which you may now see and compare with the original. The new negative has an enlarging range of 1·09, which, though rather contracted, has produced the enlargement I now show you. The next example is also an enlargement from a reproduced negative. The original negative, a snap-shot, had far too wide a range, and a reproduction was a necessity. You will see that I have, by double printing, introduced clouds, an operation not difficult to perform in enlarging. As to timing the exposure for the clouds, I give them from one-fourth to one-half the exposure I should give for the picture itself, assuming the maximum density to be the same in both cases. This serves to prevent the clouds becoming unduly heavy by the time the development of the rest of the picture is complete.

The last two examples I have to show you—one a portrait, and the other a landscape—are intended to illustrate the opinion I expressed that it is better to have a negative of too contracted rather than of too extended a range. These enlargements were produced from negatives having enlarging ranges of 0·952 and 0·896 respectively, and, when first produced, they appeared hopelessly flat and grey. The high lights and half-tones were, however, there, and you see that, by accentuating the depth of the shadows with a few touches of the brush, the prints have become comparatively bright. As I said, it is a very simple matter merely to strengthen shadows, but a work of great labour, and requiring considerable skill, to work in half-tones, which are lacking.

From these examples you will see what an assistance it is to know the range of your negative. It enables one at once to decide whether it is possible to obtain a satisfactory enlargement from any given negative.

We have, I think, sufficiently considered the range and general quality of a negative suitable for the production of an enlargement. We will now, therefore, turn our attention to the second important essential, namely, the estimation of the correct exposure. The first thing to be done is to ascertain the sensitiveness of our bromide paper, and, for this purpose, all we have to do is to discover what exposure just brings us to the commencement of the paper range; that is to say, what is the maximum exposure we can give which will only just produce evidence of deposit with full development. It is absolutely necessary, for reasons which I will point out, that this exposure be ascertained by the precise source of illumination we are going to employ for the production of our enlargement. You will remember, when I gave you a demonstration on bromide printing by contact, that I explained how the sensitiveness of the paper was ascertained. I told you that we proceeded to make a series of exposures on a strip of the paper to the light of a standard candle or to that of a paraffin lamp made equal to any desired multiple of the candle, and that each successive exposure was made double the preceding one. Well, this is precisely the course we follow in order to ascertain the commencement of the paper range for the purpose of enlarging, excepting that in this case we employ the light emanating from our lantern as the source of illumination, instead of that given by a candle or a lamp. The reason for this is that the relation between the chemical and visual rays is not the same in the case of a naked light as in the case of light passing through the condenser and objective of the optical lantern. In the latter case there is little or no obstruction to the visual rays, but the large mass of glass in the condenser and objective filters out certain chemically active rays of short wave-length which, in the case of the naked light, pass on and affect the sensitive paper. You will also remember the method I showed you of producing a series of gradations on the paper by simultaneously making a number of exposures with a revolving disc. I have here a small portable revolving disc which admits of my holding it against the screen upon which I fix the bromide paper when making an enlargement. This disc can be rotated by hand, and is precisely similar in principle to the one you saw before, excepting that, instead of producing exposures which progress by log. 2, the exposures progress by log. 1. 41, thus providing an intermediate gradation, and so rendering the decision as to the commencement of the range more exact. When making this determination, we simply project the light of the lantern upon the screen, having, of course, secured an accurate focus and a correct adjustment of the position of the light. We then measure the amount of light falling upon the disc, as you will see me do when we make our enlargement; we next place the revolving disc, with its sensitive strip, against the screen and proceed to make our exposure. I hand round three gradation determinations made upon the same paper we are going to use to-night. The first was produced with the light of an ordinary paraffin lamp, and the second also with the light of a paraffin lamp, but after passing through the condenser and objective of the lantern. You will see that the lantern gradations are about one step behind the lamp gradations throughout the scale; in the case of the simple lamp the first perceptible tint was obtained with an exposure equal to 2·5 cm., while in the case of the lantern it required an exposure equal to 5 cm. to yield the first perceptible tint. This means that the light transmitted by the lantern is only half as rich in chemically active rays as the light emanating from the simple lamp, though in the two cases the light is visually equal. The third gradation determination also gives 5 C.M. as the commencement of the range. This last determination was made with the small portable disc, while the other two were made with the large fixed disc used for ordinary speed determinations.

It will be well to say here that a little difficulty may possibly be found in deciding which exposure must be regarded as marking the commencement of the range. It is always better in case of doubt as to exactly where the range commences to take too great rather than too small an exposure. I always myself am guided by the earliest unmistakable deposit, ignoring a possible one or two gradations of an extremely faint and indecisive character. And, while about to ascertain this information regarding the paper, it is well to mask a small portion so as to be able to judge of the normal whiteness of the paper. If, after development, there is evidence of fogging on the part to which light has not had access, discard the paper altogether, it will never produce a satisfactory enlargement. Such fogging may

arise in the manufacture of the paper, or be the result of deterioration from long or careless keeping.

We have now, therefore, ascertained that the first evidence of deposit upon the paper we are going to use for our enlargement to-night is produced with an exposure to a light visually equal to 5 C.M., issuing from the lantern. This is one factor required before we can calculate the exposure we must give for the enlargement we are about to make. The other factor involves a consideration of the negative we are going to use, and is simply its maximum density. This maximum density is 1·18. This, however, you must remember, is the visual density as measured in the photometer, and it has to undergo some modification before it can be used to base the calculation of an exposure upon for the purpose of enlarging. Now, in order to make this clear to you, I have here a negative having a uniform density of 1·05, the corresponding opacity being eleven. If I hold this negative up between my eyes and a source of light, my eye will receive one-eleventh of the light it would receive without the interposition of the negative. But now imagine a piece of sensitive paper placed in the position of my eye: it might be supposed that an exposure of eleven seconds with the negative interposed would do the same chemical work on the paper as an exposure of one second to the naked light. This is not so, however; relatively less work is done when the negative is interposed, and that because a large fraction of the light reaching the paper through the negative is simply reflected back into space, the amount of light actually absorbed by the paper being alone left to do any work. So large is the amount of light reflected by the paper, that practically, instead of transmitting one-eleventh of the light it receives, we should have to regard the negative as transmitting only about one-thirtieth of the light it receives. In other words, instead of regarding the density of this negative for practical enlarging purposes as 1·05, we have to regard it as 1·4 times as great, or as 1·47.

From what we have just seen, you will understand the ground upon which Dr. Hurter and I have always based our contention that there is no one number which correctly expresses the density of a given deposit. It is perfectly obvious that two deposits respectively developed with pyrogallol and ferrous oxalate may have identical visual densities, and yet, owing to the wide difference in their colour, their actinic densities will greatly differ; but, further than this, we now see that a given deposit has three distinct density values—its visual value, its contact printing value, and its enlarging value. The visual density of a deposit, developed with ferrous oxalate, which measures 1·0, becomes a contact printing density of 0·8, and an enlarging density of 1·4.

To return to the negative which more directly concerns us this evening, and from which we are going to make our enlargement, I should like, before we proceed to calculate our exposure, to consider its enlarging range, having regard to the question we have just discussed. The visual maximum and minimum densities of this negative are 1·18 and 0·12, and the visual density range is therefore $1·18 - 0·12 = 1·06$. When, however, these densities come to be applied in the operation of enlarging, we have just seen that they require to be respectively multiplied by 1·4. This converts the visual densities 1·18 and 0·12 into the enlarging densities 1·652 and 0·168, thus making the enlarging range of the negative we are about to use 1·484. From what we saw when we considered the question of range generally, this negative, the enlarging range of which is so nearly 1·5, ought to produce a satisfactory enlargement; but of this you must judge for yourselves, when, having caught our hare, we have cooked him.

We will now proceed to calculate our exposure for the enlargement we are about to make. All we have to keep in view is that the exposure must be so timed that the action of the light passing through the maximum density of the negative shall just bring us to the commencement of the paper range; or, in other words, the exposure must be so timed that the light passing through the maximum density of the negative shall produce the same effect as an exposure, without the interposition of the negative, of 5 C.M. The maximum enlarging density of our negative is 1·652, and, as this density only transmits about one fourty-fifth of the light it receives, it is obvious that, in order to produce the same result upon the paper as would be produced by an exposure of 5 C.M. to the naked light, we shall have to multiply 5 C.M. by forty-five, the opacity corresponding to our maximum density. Five times forty-five gives us 225, and this is our required exposure in C.M.

This calculation is more conveniently made as follows:—

Maximum enlarging density of negative	1·652
Log. 5, exposure marking commencement of range ..	0·699
	2·351

The number corresponding to this logarithm is 234·4, or, say, 225, the exposure required in M.C.

Having ascertained our exposure, we will now turn our attention to the practical production of the enlargement. The lantern I am about to use is an excellent form of instrument made by Mr. Hume, of Edinburgh, and known as the "Cantilever." The optical parts of the lantern are extremely satisfactory, and the illumination afforded by the lamp is very even, and free from any image of the flame. The lantern runs on rails, thus permitting of easy adjustment, and the bellows are removable so as to permit of the lantern being used for the demonstration of physical and chemical experiments. The objective is fitted with a cap containing orange glass, so as to provide non-actinic light for the adjustment of the sensitive medium.

We will now focus the image upon the screen, and adjust the lamp so as to give a perfectly evenly illuminated disc. The next thing to do will be to ascertain the value of the disc in candle metres. For this purpose I have here a portable photometer bar, provided at one end with a wire rod, which is held against the screen in such a way as to cast two shadows side by side, one thrown by the light of the lantern, and the other by the light of a candle, so arranged as to slide backwards and forwards upon the bar. The bar is marked with a scale which indicates the value of the disc in candle metres when the two shadows are of equal intensity. As these shadows vary considerably in colour, the difficulty in comparing their intensities is overcome by viewing them through a piece of green glass. Applying this bar, we learn that the value of our disc is four and a half candle metres, and, as our exposure was calculated to be 225 seconds to one candle metre, we shall actually have to give an exposure of 225 divided by four and a half, or fifty seconds.

Our enlargement is now before you, and I must leave the judgment in your hands as to whether I have been justified in laying the stress I have done upon the important parts played by the range of the negative and the exposure. I think it will be well for you to see the negative which produced the enlargement before you, and I will therefore hand it round. The question is, Does our print fairly utilise the entire range of the paper and give a satisfactory rendering of the half-tones? If you answer "yes," I think we may conclude that neither the range of the negative nor the exposure were far wrong. A very old maxim applied to the production of negatives in the camera was, "Take care of the shadows, and let the high lights take care of themselves." In the case of enlargements on bromide paper I would say, "Take care of the half-tones, and let the shadows take care of themselves."

I dare say you have expected me to say something on the subject of the development of bromide paper. I have not done so because the operation is so very simple that it can hardly go wrong. The negative and the exposure are the potent factors, the question of development resolving itself into the individual characteristics of different reducing agents. This question I may have something to say about on some other occasion; but, for the present, you will not do wrong in using, as I have done to-night, ferrous oxalate. All I would say on the development of bromide paper is, Observe the strictest cleanliness, use plenty of yellow light, and wash well with water acidulated with acetic acid immediately after development.

With regard to the factor 1·4 for converting the visual into the enlarging density, this strictly only applies in the case of negatives developed with ferrous oxalate. In the case of negatives very yellow in colour as from development with unpreserved pyrogallol, this factor will be somewhat greater: how much will be easily decided by an experiment or two.

I much regret that time did not allow me to prepare a more imposing series of examples, both as to number, size, and finish: but I trust that those I have been able to show you have, at any rate, been sufficient to demonstrate the chief points which it has been my object to lay prominently before you. Had I contemplated that this demonstration would be given in this large room, I should certainly not have been satisfied to confine myself to the comparatively narrow limits of a 12×10 enlargement; but, when it was decided to hold our meeting here, it was too late for me to change my plans.

I cannot but feel that, in these days of snap-shots, and the consequent production of small negatives, enlargement has a special importance. It is true that, to produce a good enlargement, we must have an adequately exposed negative, and it is, unfortunately, also true that an enormous percentage of snap-shots are made almost regardless of exposure, and result, of course, in under-exposed negatives, totally unfit for the purpose of enlargement. This is not as it should be, and not as it need be. There is no valid reason why we should not obtain good enlarged copies of our hand-camera negatives if we so wish.

I have to-night had another opportunity of demonstrating to you the scientific as opposed to the rule-of-thumb method; and, though some of you may take a conservative view of the case, and prefer to cling to the good old-fashioned ways, I think you will agree that, at any rate, there is something in scientific procedure. Though the measurements and calculations we have considered may at first sight appear to be a circuitous course to take as compared with rule of thumb, I assure you that a very little familiarity with them would cause you to think differently, and, having once tasted the pleasure of working by pre-calculation, I am certain you would never care to go back. I can hardly hope that you will all go home vowing never again to use a negative of which you have not ascertained the maximum and minimum densities; but if we have learnt nothing else this evening, we may at least have gained a general idea as to the quality a negative ought to possess if we want it for the purpose of enlargement. I sincerely hope the members of our Society may be induced to take up the practice of enlarging, particularly as, owing to the munificence of Mr. Gossage, we are now the possessors of a lantern.

In conclusion, I will only express my thanks to you all for your patient hearing, and I trust that, while I may have interested some of you, I have at least not wearied others. V. C. Driffield.

PHOTO-MECHANICAL NOTES.

The mechanical regularity of the grain in half-tone process blocks is, even at its best, offensive to some minds, and no doubt there are many workers who are experimenting with the view to securing a grained effect which, whilst being equally as differential as that produced by means of the screen, will not look so severely mechanical. For my own part, I hardly think it likely that anything really novel, or anything superlatively better than the present system of machine-ruled lines, will be readily discovered. The earlier experimenters, from Fox Talbot downwards, exhausted practically every likely resource in the breaking up of the half-tones into a printable grain. It is, indeed, surprising what a variety of methods have been tried at one time or another. Gauze, either in the form of muslin, crape, tulle, silk net, or wire net, was always the most obvious thing which suggested itself, and Talbot's earliest experiments were made with such materials. Using two or three thicknesses, he was able to secure a grain which was not at all mechanical; but, if I remember rightly, he only attempted intaglio copper plates sensitised with bitumen, placing the gauze between the diapositive and the copper plate. The delicacy of intaglio printing enabled him to secure results which he could not possibly have attained with relief blocks. But Talbot's best efforts were with dusted-on grains of resin, bitumen, copal, &c., and his experiments were the genesis of the photogravure process. This was in 1852, and we hear of no other experimenters of importance in the half-tone process until 1866, when Messrs. E. & J. Bullock patented the germ of the process in use to-day. Their method was to superimpose, on a transparent positive, a grained screen, and to take a negative from the two together. In their specification they described numerous ways of securing this grained screen, and gauze network was one of them.

Even after the Meisenbach process had been patented, and successfully worked, there were many who clung to the idea that, granted the gauze could be obtained fine enough, it would be possible to use it as a screen in the camera. In fact, I know that blocks were produced by this means, but at their best they looked like a design for Berlin wool work.

I look back now with some amusement on my own efforts to use a silk gauze which is manufactured in Switzerland for making sieves. I accounted this a very good find—it seemed so beautifully regular in texture, and could be had in degrees of fineness quite equal to the screens of to-day. Every mesh was a perfect square, and it seemed the ideal thing. But a curious difficulty I met with was that, even when the gauze was in absolute contact, the lines on the negative corresponding to the threads were never clear. I was not able to get them so until I hit upon the expedient of dyeing the gauze black—it was a creamy white to begin with. Whether it was that the light penetrated the threads, or that the trouble was due to reflection of light from the threads, was a question I never attempted to solve; any way, the black gauze overcame the difficulty. I used this gauze also between an ordinary negative and the zinc plate, but here, again, I achieved no success until the gauze was dyed black. Though I was technically successful in using this gauze as a screen, I was dissatisfied with it, because, no matter how fine the gauze might be, the thread in one direction—the warp I suppose it was—showed more strongly than the other—the woof. There seemed to be no possibility of getting anything better, and therefore I dropped the gauze idea. This was before the advent of Levy and Wolfe screens, and my next essays were in copying from ruled sheets.

Some years earlier I experimented with Woodbury reliefs. By inking the relief, and then taking an impression upon grained transfer paper, I was able to get fairly good results, which were transferred to zinc or stone. But the making of reliefs was too troublesome. Zuccato's and Ives's processes were somewhat on these lines, and I think it was through reading descriptions of them that I was led to experiment with a more simple application of the idea. Zuccato, instead of using grained transfer paper, had a piece of metal cut with V-shaped ridges, somewhat like a file. This was used as a backing to the impression on thin paper, applied to the previously inked relief. Ives had a rubber pad, with a pyramidal grain. This was inked and pressed into contact with a plaster cast taken from a swelled gelatine relief. The inked rubber pad naturally impressed dots of varying degrees of fineness, according to the amount of relief on the cast. A negative was then taken from the latter. In both these processes the stipple was machine-ruled, but obviously a hand stipple, a stone, an aquatint, a mezzotint, or reticulated grain, would be equally possible, though I imagine a somewhat coarse machine grain would best suit the requirements of such a process.

Several attempts have been made to reproduce the rough grain of paper by throwing a strong oblique light upon it, but this has never been a success. Speaking of paper reminds me of Asser's process—a transfer method—which relied for grain on the roughness of the paper. A rough-grained unsized paper was charged with starch, and sensitised with bichromate, exposed to light under a negative, washed, dried, and heated by the application of a hot iron to the back of the sheet. This made the bichromated starch image pick up ink when the paper was damped, and an ink roller applied. A granular image was thus produced, and was transferred to stone. It might have been photographed, as rough pencil sketches are now photographed.

A grain produced by the reticulation of gelatine has been tried in various ways, but it has always been found an impracticable grain to etch. Sprague's Ink photo process, and Husband's Papyrotint process were successful applications of this grain to lithographic printing, and Mr. W. D. Richmond has shown me very beautiful results with a grain of this nature. It is possible to electrotype or stereotype this kind of grain, and the Pretsch process embodies this application, which was followed up by Dallas, who still produces blocks by some method of this kind. A defect I have noticed in electros from reticulated reliefs is, that, where there is an abrupt transition from black to white, there is a halo following the outline. This is caused by the black being in higher relief. It is, I dare say, only possible to overcome this by preserving a more even tone, and this results in flatness, which is a marked characteristic of such blocks. Attempts have been made to use a grain of this nature as a screen, but not, so far as I know, with any success.

Woodbury experimented a good deal to secure typographic blocks with a discriminating grain. He exposed his ordinary relief under a transparency with a piece of network interposed. The stippled relief thus secured was inked, and a transfer from it applied to zinc and etched out. One of Woodbury's blocks was presented by Mr. T. Bolas to the Royal Photographic Society at a recent meeting.

Another method of Woodbury's was to incorporate with the gelatine, when forming his relief, a gritty powder. The resulting grained relief was pressed into lead, and an electrotype taken from it.

Waterhouse and Sawyer individually applied a similar idea to the carbon process. The former powdered a carbon print whilst wet with waxed sand. When the carbon print was dry the sand was brushed away, and the grain thus left. The plate was black-leaded, and an electro taken from it. Sawyer replaced the pigment of carbon tissue by powdered graphite, thus making the print a conductor of electricity, and allowing it to be electrotyped.

The photogravure grain has often been tried for typographic blocks, but never with success, owing to the difficulty of printing from such a surface. This grain has also been deposited on glass, and used as a screen, but the result is flat and harsh.

I have seen a very good result by making a screen from a hand-stipple of such a pattern as is used by chromo-lithographers. The result was certainly very pleasing, especially in the case of a portrait, the pattern of the stipple giving a nice rotundity. But imagine the trouble of producing such a screen in any considerable size. To correspond with a ruled screen of 125 lines to the inch, there would be nearly 20,000 dots to the inch, each one of which would have to be separately made by hand. With extreme care, possibly the labour might be lessened by repeating a strip of stipple by retransfer, but

the value of such a screen, however produced, would hardly be commensurate with the effort.

Of "crank" ideas for producing screens, one of the most remarkable I ever heard of was the locking up, as a printer locks up type, of some thousands of needles. The upstanding points were ground flat, then inked, and an impression taken from same. Unfortunately the author of this ingenious notion did not live to make use of his invention. Should any one care to follow up a similar line, I make them a present of the suggestion that they should, in the same way, set up a forme of what printers call "full points," and which the ordinary individual knows as "full stops."

Only the other day I read of a suggestion to secure a screen by making a pile of alternate sheets of black and white paper, and taking a clean cut off same with a guillotine paper-cutter, then photographing the cut edge.

I have also heard of an individual who painted the wall of his studio in black stripes, with the view to reducing them, and it was only when he had completed his task that he found he could not get his camera sufficiently far away to obtain the necessary reduction. In another case threads were laced on a frame at equal distances apart, harp fashion. It is sad to contemplate all this misplaced ingenuity.

After all, Mr. Max Levy's cross-line screens have been the only commercially successful means of obtaining a typographic grain, and he has just made a marvellous improvement on his own method. This is the subject of a patent recently taken out in this country and in the United States. The exact nature of the invention cannot be comprehended from the patent specification, but further details and results, which I have seen, convince me that it will have far-reaching effects on the future of half-tone process work. Compared even with the high standard of excellence which American process work has now reached, it goes "one better." The most careful work of the wood or steel-plate engraver could not surpass the result for tonality and detail, for roundness and softness. The harsh mechanical grain of the screen is lost, and one only perceives the delicate beauty of the picture.

This result has been brought about by varying the ruling of the screen, but so varied and subtle are the different shapes and sizes of dots produced, that the most skilful half-tone worker would fail to grasp the character of the screen by analysing the system of the grain in the resulting print. Mr. Max Levy says in his specification: "In order to carry out my invention, it is necessary to have a screen, or grating, which will have transparent apertures of different sizes arranged in groups, and also opaque obstructions to the light, differing in value from each other, and also arranged in groups. These groups may each consist of two, three, four, or more individual members, and the chief condition is, that both transparent and opaque members should differ in size from one another. Such a screen may be formed of lines alternately thick and thin, and crossed at, or nearly at, right angles, and in this case one of the sets of lines in each direction must be displaced from the middle of the space formed by the complimentary set of lines, so as to form four transparent apertures, varying in size, and the intersections of the thinner and thicker lines will form the necessary opaque obstructions, which also vary in size."

Some further light is thrown on this description by Mr. Levy explaining that the screen used in making the illustration to which I have referred consists of four series of lines, two sets crossed at right angles to each other, and the other two sets at an angle of 45° to the first two, which implies, of course, that these latter are also at right angles with each other.

The screen is used in the same manner as the ordinary cross-lined screen, by being placed in the camera in front of the sensitive plate. From a screen of this nature it will be possible to produce at least six distinct shades of tone, ranging from a fine dot to a solid black. At present it is hardly possible to obtain more than three.

The new screen has not yet left Mr. Levy's hands, and may not do so for some time yet, as he states that he does not regard the idea as fully developed.

There can be no doubt, however, that Mr. Levy has made a big step in advance, but he has set himself a task which must be full of difficulty, for the slightest fault in the production of the screen will throw out the geometric arrangement of the spacing. Every half-tone worker will cordially wish him success.

WM. GAMBLE.

MR. ALEXANDER BASSANO, of 25, Old Bond-street, writes: "I hereby beg to inform you that I have taken over the business recently carried on under the style and title of 'Alexander Bassano, Limited.'"

CARBON PRINTING WITHOUT TRANSFER.*

I COME now to the Artigue paper—*papier velours*, or sawdust process paper. I propose to treat the technical part of the preparation and manipulation of this paper in the same summary manner as I have dealt with that which I have just described. The reason that the Artigue paper is so little known in this country, or indeed elsewhere, is due to the fact that it is rather difficult to procure. I myself wrote several letters to the maker, and, as others have experienced, could obtain no replies of any kind. It is said that the applications which are made to him, instead of pleasing him, produce the contrary impression. However, although we may regret this, it is, of course, more his business than ours, and I need only say that, through the kind offices of a friend in Paris, I was at last able to obtain these prints and some of the prepared, but unsensitised, paper. Referring, first of all, to the examples, I think all will admit that we have here a carbon paper of a very high degree of excellence. What intense blacks, and what purity and brilliancy of white, does it not appear to give; and, again, how extended, I might almost say unusual, are the scale and gradation of tones! What a delightfully soft-surface texture! We have have, undoubtedly, as I remarked in the early part of my lecture, a paper directly coated with pigment, directly sensitised, and capable of development from the front, without any transfer; and I cannot help again expressing my surprise that the possibility of obtaining these qualities should so long have escaped solution in our own country. The layer of pigment is, you will perceive, of extreme fineness and tenuity, probably, I should imagine, composed of tiny molecules, each one of which may be capable of absorbing on its surface the sensitising liquid. What the colloid employed, and what the precise method of coating may be, I am not at present prepared to say; but I may think you may take it that the soluble substance is not ordinary gelatine or gum. You see how very tender the coating is, and how easily removed with a damp finger. The fineness of the coating is, of course, of great importance where it is sought to obtain results such as these examples. For my own part, they are not of the kind which I aim at, and I am glad to believe that some differences, both in coating and in sensitising, may put into our hands means of producing almost any effect we may require. It is from this broad and general point of view that I ask you to consider this paper, and not entirely from the consideration of the pictures, however beautiful they may be in their way. At present I understand that the paper is only made in black, but there would appear to be no reason why almost any coloured pigment should not be equally suitable. The paper, having been exposed in the usual way by the aid of an actinometer (and I may say that, for rapidity, it appears to me, when freshly sensitised, to be twice or even three times as fast as the most rapid silver paper), is developed as follows: It is attached to a slip of wood, and held vertically with one hand over a deep dish. Then, with the other hand, from a jug or coffee-pot of this kind, a stream of warm water, in which fine sawdust is mixed, is allowed to flow gently over the surface of the pigment until the unexposed portions, aided by the rubbing action of the falling sawdust, have been washed away. That is the whole mystery of the sawdust process. As to details, a few brief remarks may be useful; and, first, as to sensitising the pigmented paper. This may be done in an ordinary printing frame; but, on account of the uneven cockling of the paper, I prefer the inventor's method, which is as follows: Prepare a five per cent. solution of bichromate of potash. Place the paper in this way, face downwards, on a sheet of glass, raised a little above the table, and somewhat smaller than the paper to be sensitised. Then apply the solution evenly with a flat camel's-hair brush, giving at intervals a few more coatings. Ten minutes after the first application, dry off the surface moisture with a badger's-hair softener, or in some other convenient way. Cover the paper with a dish, and allow it to remain covered for half an hour, in order that the drying may not be too rapid, and that the paper should have time to thoroughly absorb the solution. Dry afterwards in the dark, the previous operations having been conducted in a good light. I have myself sensitised the tissue by immersion in the bichromate, and, so far as my limited experience goes, I do not know but what this method is equally as good as the other. The sensitiveness is, of course, considerably increased. I should be glad to hear remarks on this matter. It requires to be carefully done, especially in the drying; otherwise the pigment is liable to float completely off the paper in the sensitising bath, or to become disintegrated almost the moment before becoming quite dry, as in this example. I find this accident is likely to happen if the paper is pinned up by one corner to dry, instead of lying flat or across a piece of curved cardboard, such as is used in the Autotype process. For development, it is

* Concluded from page 711.

advisable to have two pouring vessels—one with a thin mixture of sawdust at a low temperature of about 75°, the other with a very thick and hot mixture. The thicker the mixture, the quicker and more forcible is the development. Now and again, as the action proceeds, the surface of the print may be washed with a spray of cold water and the degree of progress ascertained. I need not stay to follow the development throughout, nor the failures which may occur, and their causes and remedies. The latter are naturally analogous to those we find in the more usual system of carbon printing, and those who are accustomed to this will have no difficulty in adapting their experience. Still I cannot help thinking that, with this method, we have at our disposal an unusual degree of latitude. [The lecturer here exposed several pieces of the sensitised paper, under negatives, to the oxymagnesium lamp for twenty seconds, and afterwards developed them, using a brush for the purpose. He remarked that probably it was the first time that carbon prints had been made by exposure to artificial light, and that the change which took place in the compound in such a small space of time by the mere action of light was of great interest to consider.]

Later on, I hope we may have an opportunity of testing together, though in a rough-and-ready way, some sensitised pieces of this paper. Meanwhile, before the discussion which may possibly follow, allow me to return to the remarks which I made at the commencement of my lecture, and more especially to the advantages which I wish to emphasise with regard to the freedom of treatment which these revived methods ought to place at our disposal. As to the results, they are liable to be qualified, I know, as imitations—photography aping other methods, and so on—stones so easy to throw, and picked up and used by the most thoughtless. Nothing, in my opinion, is more unjustifiable than this charge; nothing so unfair, and, I can hardly help saying, unworthy of some who have brought it to win the applause of the moment. The resemblance which is called imitation cannot be avoided, or rather need not be avoided. We work in photography upon the same principles which govern other art in black-and-white or monochrome, and our aim should be to produce work which, under all aspects, will stand comparison. There is nothing contrary to the art of painting by light when we produce an enamel which is like a miniature painting, a platinum print which recalls the best effects of a mezzotint, a photogravure which is truly an etching, or a carbon print which is truly a drawing by light in pure carbon or charcoal, and which therefore may be like a charcoal drawing. None of these arts have a monopoly which is disturbed in the same way as when water colour trenches upon the technique of an oil painting. But I can well understand that when, with monochrome colours, an attempt is made (as I have several times seen) to imitate the preciseness and general character of a mechanical photograph, that such a practice is reprehensible. Happily it cannot fail to be disastrous.

There is one set of examples which I think should be always for us a subject of study and imitation, at any rate at the present stage of our history—that is, the *Liber Studiorum*. It is unfortunate that a complete collection in a fine state should be so rare and expensive; but it may be seen in our national libraries. I look forward to the time when a publisher may have enterprise enough to bring out a new edition by some photographic process, with all the improvements which recent progress may give. The only reproduction now in the market is defective, although produced, I believe, under Mr. Stopford Brooke's supervision. It fails completely to give Turner's own etched work—the original outlines, I mean—and I do not see that this need necessarily be in photography.

By my use of the term imitation I feel that I lay myself open to carping critics, but I have no desire to avert their wrath by beating about the bush. In point of fact, I am delighted to place further difficulties in their way of distinguishing between what is like and not the same, original and not new, on convergent lines and still in no danger of clashing. For there is no new thing under the sun, said the Wise Man.

ALFRED MASKELL.

News and Notes.

MR. J. PRESTON, of Sheffield, writes: "Having purchased the stock and fixtures belonging to Mr. R. Watts, our large and varied stock is removed to the premises lately occupied by him, at 56, Fargate (opposite the Young Men's Christian Association Buildings)."

LEYTONSTONE EXHIBITION.—The Hon. Secretaries write: "Will you kindly allow us through your columns to draw the attention of intending exhibitors at the above Exhibition to the fact that entry forms cannot be received later than Monday, November 19."

MESSRS. WRATTEN & WAINWRIGHT, of 38, Great Queen-street, Long Acre, W.C., inform us that, during the winter months, their warehouse and offices will close each evening at half-past six, and on Saturdays at two o'clock, instead of seven and three o'clock respectively as hitherto.

MR. J. EPSTEIN, of 33, Broad-street, Bristol, was awarded a silver medal on Friday, November 2, at the Leicestershire Trades and Industrial Exhibition, Floral Hall, Leicester, for picture-frame mouldings and mounts. The same firm was awarded, this year, a silver medal at the National Trades and Industrial Exhibition, Bingley Hall, Birmingham.

THE STANLEY SHOW.—In the picture section will be found about 700 frames by about 200 exhibitors, including W. Clement Williams (Chicago Exhibit), R. H. Lord, J. H. Gear, J. E. Goold (torpedoes, rifle-bullet, and warship photographs), Diston, Warneuke, Norrie, Coulthurst, Hankins, Pasco, Mowll and Morrison, Lankester, Cadby, Job, Wane, Hall-Edwards, Viscount Maitland, Lysaght, Bennett, Anckorn, &c. The foreign exhibitors are—America: Messrs. Eickemeyer, Post, Moore, Baker. Italy: Selfa, Pluschow, Gloeden and Bellotti. Germany: Scharf, Obernetter. Belgium: Selb. Natal: Smith. In the apparatus section will be found the following firms: Eastman Company, Adams & Co., Shew, Butcher, Hannam, Wormald, Airs, Platt & Witte, Park, Vedette, Automatic Company, Hare & Co., &c.

ENTRIES for the South London Exhibition close on Monday next, the 19th inst. The following Lantern entertainments have been arranged:—Tuesday, November 27, *Dogs, and Anecdotes concerning Them*, Mr. Thomas Fall. Wednesday, 28, *A Trip to Scotland—The East Coast*, Messrs. Edwards and Esler. Thursday, 29, *A Trip to Scotland—The West Coast*, Messrs. Edwards and Esler. Friday, 30, *Japan and the Japanese*, illustrated by slides by native artists, Mr. C. H. Higgins. Saturday, December 1, title to be announced, Mr. C. F. Dickinson. Among the manufactures and dealers who are exhibiting at the exhibition, are the following:—Messrs. Airs & Co., the Automatic Company, Mr. R. R. Beard, Messrs. R. and J. Beck, the Cresco-fylma Company, Mr. B. J. Edwards, Mr. Maurice Howell, Mr. Jones-Mitchell, Mr. R. Park, the Parkes Drug Company, Mr. T. H. Powell, the Prosser Robberts Drug Company, Mr. O. Scholzig, Mr. W. F. Slater, Mr. William Tylar, Mr. Walker, Mr. E. A. Whitby and the Zenotype Company. The Judges will be: Mr. W. E. Debenham, Mr. Thomas Fall, and Mr. Leon Warnerke.

THE LATE COLONEL C. G. H. KINNEAR.—Mr. W. Forgan writes: "Colonel Kinnear died on the 5th inst., at his house in Grosvenor-crescent, Edinburgh of heart disease. He was head of the firm of Peddie & Kinnear, Architects He it was who first suggested the use of the bellows body for photographic cameras, and for many years the *Kinnear Camera* was a 'household word' among photographers. Colonel Kinnear was a member of the Edinburgh Photographic Society, but was seldom present at any of its meetings. He did, however, attend one, the attraction, apparently, being an Exhibition by the members present, of the various forms of bellows cameras in use at the time. The writer, from the chair, directed the attention of the members to his presence, and to the fact that the use of the bellows body was his suggestion, and also that he was probably the oldest photographer present. After the business was over, Colonel Kinnear inquired how the writer knew this, when he was informed that he was seen from a window in the Town Clerk's office photographing Falkland Palace about the year 1848. Colonel Kinnear was the son of Charles Kinnear, Esq., of Kinloch, in the parish of Collessie, and the county of Fife. The late Mr. Charles Kinnear was the owner of Wilkie's famous picture of *Pitlessie Fair*, which was exhibited in The National Gallery, Edinburgh, some years ago. The father of the writer was born at Bogie's Kinloch on the same day of the week and in the same month and year as the late Mr. Charles Kinnear. Photographers everywhere ought to bear in kindly remembrance the name of one who, by the suggestion he made, even in so small a matter, has done not a little to *lighten* their labours."

THE ACTION OF SODIUM HYPOSULPHITE ON THE DEVELOPED IMAGE.—"Does the developed image lose intensity in the fixing bath? is a question which is often asked," says Mr. A. H. Sexton, F.C.S., F.I.C., in *Photographic Scraps*, "and to which various answers are given. The usual answer, given with all the assurance of partial knowledge, is: There can be no reducing action on the image, for the image is metallic silver, and silver is unacted on by sodium hyposulphite. The accuracy of this answer depends on the validity of the premises assumed, viz., the nature of the image and the insolubility of silver in sodium hyposulphite; and, unfortunately, the latter cannot be granted. It must be remembered that solubility or insolubility, at any rate when the words are used in ordinary conversation, implies a difference in degree only, and not in kind, a substance being said to be insoluble when the solubility is so slight that for ordinary purposes it can be neglected. The solubility of a substance depends, not only on its nature but on the conditions under which it is exposed to the action of the solvent, there being hardly any substances that are absolutely insoluble under all conditions. In order to test the solubility of metallic silver in a solution of sodium hyposulphite, some pure silver in a fine state of division was prepared, weighed portions were placed in solutions of sodium hyposulphite of varying strengths, and were left at the ordinary atmospheric temperatures for some days. The silver was then filtered off and weighed, the filtrates were carefully examined, and any silver which had passed into solution was determined. In every case a considerable quantity of silver was found in solution, so that finely divided silver is not insoluble in sodium hyposulphite. The bearing of this fact on photographic work is obvious. The developed image consists in the main, at any rate, of metallic silver, and it is in an extremely fine state of division, far finer than that used in the experiments above mentioned; and, as fineness of division is one of the conditions which most favours solution, it might be expected that the silver in the developed image would be likely to be attacked. To test this, a considerable number of experiments have been made. For various reasons bromide prints were used, instead of images on glass. Each print was cut up into strips, one at least of which was always reserved for comparison. The solutions used were: (1) ten per cent. sodium hyposulphite; (2) twenty per

cent. sodium hyposulphite; (3) ten per cent. sodium hyposulphite, to which a little potassium metabisulphite had been added to give it an acid reaction. The first prints used had been developed with hydroquinone. The strips were put into large test tubes covered with the solutions, and were left at the ordinary temperature exposed to light and air. The action was slow, the image showed signs of fading in about four hours, and in about thirty hours it had almost completely disappeared. The action of the twenty per cent. solution was somewhat more energetic than the ten per cent. solution, and the addition of the acid sulphite seemed to have no influence. Prints developed with ferrous oxalate were next tried, solutions of the same strengths being used. In one and a half hours the reduction was quite marked, and in two hours the image had become very pale. Having used amidol largely for bromide work, a large number of experiments were made with bromide prints developed with it. In one hour the image was very decidedly paler, in two hours it had become very pale, and in about four hours the image had disappeared, the twenty per cent. solution acting most vigorously. Paper developed with metol behaved in exactly the same way, the image being sensibly reduced in one hour, and becoming very pale in two hours. These experiments, which are to be taken merely as a preliminary sketch, and which will be continued, seem to demonstrate—(1) Metallic silver is not insoluble in solutions of sodium hyposulphite; (2) That the silver in the developed image, being very finely divided, is in a condition to be easily acted on by sodium hyposulphite; (3) That the different developers give images which are differently acted on, probably on account of differences in the state of division of the silver, the amidol or metol image being most acted on, and the hydroquinone image least; (4) That the stronger the solution of hyposulphite (within limits) the greater is its solvent power, and that the addition of acid sulphite appears to have little or no influence; (5) That for solutions of ordinary strength there is no reduction during the time which would be ordinarily occupied in fixing, but in all cases long soaking in hypo should be avoided. The reduction brought about by the action of hypo cannot be used for the reduction of over-printed prints, because the pure detail just disappears, and the image soon acquires an unpleasant brownish colour, and even after very long action a very faint brownish image remains on the paper. Some experiments seemed to indicate that the presence of developing agents, especially amidol, in the hyposulphite solution accelerates the reduction of the image; this point, however, requires further investigation. Experiments were also made with gelatino-chloride paper with solution of the same strengths. In less than an hour the images showed distinct reduction, and in four and a half hours they had almost disappeared.

Our Editorial Table.

Wood's Catalogue of Slides, Optical Lanterns, &c.

E. G. Wood, 74, Cheapside, E.C.

This, the forty-eighth issue of Mr. Wood's slide catalogue, comprises a list of some thousands of slides of popular and attractive subjects. Particulars of many varieties of lanterns, apparatus and accessories are also included.

Fallowfield's Photographic Remembrancer.

No. 77 of this seven-year-old *Remembrancer* has been received. It is issued for "end of November." This number is mainly devoted to lantern and lantern requirements, and when we turn over its well illustrated pages, we realise the magnitude of the lantern trade. Here are single and biunial lanterns, lamps for oil, and burners of all kinds for gas, screens, reading lamps, gas cylinders, cameras for making slides, and mats and paper for binding them. Arc lamps too have their place in this catalogue. From the number and variety of magnesium lamps for portraiture, we infer that Mr. Fallowfield expects much will be done in the fascinating pursuit of parlour portraiture these dark evenings. Certainly, it is no fault of his if people lack the materials for indulging in the pastime. Albums, portfolios, plates, films, and even spectacles (phototone), all contribute to the compilation of a goodly *Remembrancer*. We have also received from Jonathan Fallowfield a very fine and varied collection of samples of Christmas and New Year's mounts, suitable both for portraits, groups, and landscapes, excellent in design and beautiful in execution.

Beautiful Britain.

The unprecedented success of Stoddart's pictures appear to have induced the publishers (Werner & Co., of Chicago, and 13A, Cockspur-street, London) to enter upon a new series, in which the subjects are to be confined to "Beautiful Britain." We have not ascertained the price, but if it is the same as that of the Stoddart Series, viz., sixteen for sixpence, the sale will be very great. The views already issued are 10×8 inches, and for the most part are confined to old castles, such as those of Tantallon, Conway, Richmond, Carisbrooke, Rochester, &c. They are well printed from half-tone blocks. They will be useful, *inter alia*, for the reception-room table to interest customers who are waiting their turn.

A Lantern-slide Print-washer.

Messrs. Taylor, Tunnicliff, & Co., of Eastwood, Hanley, have just introduced a lantern-plate print-washer, formed of the Granitine ware, for the manufacture of which this firm is so justly celebrated. The washer is a grooved trough, capable of containing one dozen plates, and the washing arrangement is such as to syphon off the water from below. It will, doubtless, have great popularity now that the dark season is upon us and so many evenings are being devoted to lantern pursuits.

The Strand Magazine and The Picture Magazine for November (Geo. Newnes & Co., Ltd.) are, as usual, copiously illustrated. The latter of these contains a selection from the yachting photographs of Messrs. West & Son, ever graceful with their white wings. The *Strand* has an illustrated interview with Lord and Lady Brassey, with portraits and external and interior views of the famous *Sunbeam*. The portraits of celebrities at different times of their lives embrace Lord Harris, Sir F. Knollys, Lady Henry Somerset, and Leslie Ward; there is besides much excellent general reading matter.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,164.—"Improvements in Lantern-slide Binding Clamps." J. F. H. Edwards.—*Dated November*, 1894.

No. 21,240.—"An Improved Form of Cut-off for Dissolvers for use with Optical Lanterns, specially relating to Biunials and Triple Lanterns." C. G. Norton.—*Dated November*, 1894.

No. 21,406.—"An Apparatus for the Production of Stereoscopic Photographs with a Single-lens Camera at one Exposure." T. Brown.—*Dated November*, 1894.

No. 21,458.—"Improvements relating to Doublet Lenses for Photographic purposes." C. P. Goerz and E. von Höegh.—*Dated November*, 1894.

No. 21,573.—"Improvement in Photographic Dark Slides by an Appliance showing Automatically when Plates therein have been Exposed." E. A. Whitby.—*Dated November*, 1894.

No. 21,591.—"Improvements in the Mounting of Tinted Photographs." A. Findlow.—*Dated November*, 1894.

PATENTS COMPLETED.

Improvements in or relating to Photographing in Colours.

No. 14,161. John Joly, 39, Waterloo-road, Dublin, Ireland. *September* 29, 1894.

The object of my invention is to obtain, by means of a single photographic image of an object, a representation of this object in its natural colours, or in colours seeming such to the eye.

A sensitive film, sensitised for the red rays (when all colours are to be reproduced), is exposed beneath a particoloured screen bearing lines ruled in transparent pigments. These lines may lie diagonally or otherwise on the plate. They are ruled in three several tints, having such selective light absorption properties as will secure that:—One line will so sift the light passing through it that the sensitive film beneath will be affected in a manner corresponding to the manner in which (according to colour measurements and theory) the red-sensitive nerves in the human eye are effected by the various wave-lengths of the spectrum. A second line will similarly sift the rays falling upon it, so that the plate beneath will be affected in the same manner as the green-sensitive nerves are affected by the several wave-lengths. The third line will do this in the manner in which the blue-violet-sensitive nerves are affected. The coloured lines are ruled on so as to lie adjacent to one another, and of similar width. A dividing engine, or similar machine, being employed to shift the plate beneath the pen or pens on the completion of each stroke. The dyes or pigments used must be suited to the sensitiveness of the plate to the several wave-lengths. Thus I may use chrysoidine orange for the red-selecting line, ethyl green and chrysoidine orange for the green-selecting line, water blue for the blue-violet selecting-line, or any other pigment which I may find suitable. The plate taken for exposure under this screen must be placed in the camera with its sensitive surface bearing in close contact with the ruled surface of the screen. The rays fall upon it after passing through the screen. An unlimited number of plates may be successively exposed under the same screen.

Upon development of the plate in the usual manner, an image in the usual silver deposit is obtained, which shows no colour, but is finely divided into linear areas, every third area registering the image as sifted through the red-selecting dye, every third again the image as sifted through the green-selecting dye, every third, again, the image as transmitted through the blue-violet selecting dye. It being understood that the lines upon the primary or taking screen being in the successive order, red, green, blue-violet, red . . . and so on, no two lines of the same colour-selective properties lying adjacent to one another.

From this negative a positive transparency is printed by contact in the usual manner. This contains the same registration of the colour-selective properties of the dyes, only that now what was before opaque has become transparent. If, now, this photograph is viewed through a screen with lines ruled in transparent pigments of the same dimensions as those used in taking the plate, but

in the three primary colours, red, green, and blue-violet, and so placed against the photograph that a red-coloured line falls upon a linear strip of the image, which had been taken through a red-selecting line upon the taking screen, a green line upon a strip of the image previously obtained through a green-selecting line, and so for the blue-violet also, then the image is seen in its original colours. To produce this effect upon the eye, and also not to interfere with the form of the image, the lines must be of sufficient fineness to blend, or be unobtrusive, when viewed by the unaided eye. Hence it is desirable that the lines be ruled some 200 to the inch or closer.

In viewing the picture through the particoloured screen, it is essential that the lines on both plates (the photograph and the screen) be in close contact. I may use plates of specially flat or polished plate-glass to secure closer contact. I may also rule the primary colours directly upon the photograph. Similarly I may use a sensitive plate for taking the photograph in the first instance, which has the requisite selectively absorbing colour tints ruled directly upon the sensitive surface, and which may wash off in the subsequent operations attending development. I may, of course, develop the original photograph as a positive and then rule the lines upon its surface.

Instead of a linear "pattern," I may use one consisting of squares, diamonds, or any other similar suitable forms, the colours in this case being stamped or rolled upon the plate from a surface bearing minute raised patches suitably spaced, so that, after three such printing operations, the entire surface of the plate may be overlaid with patches of the three requisite colours in close juxtaposition. The taking and viewing screens are, of course, stamped or printed to the same dimensions and form of "pattern," or I may lay in the tints by use of dotting pens, which are vibrated mechanically as the plate is passed beneath them. I may also take and view the photograph through lines having the same tints, that is, tints approximating to the three primary colour sensations; or I may secure an approximation to the original colour sensations by the use of more than three tints, as in some methods of composite photography, and these may be the same, both in taking and viewing the picture. In cases where I use the same tints for the lines used in taking and viewing the picture, I may lay those down upon the solid transparent support of the sensitive film as a substratum, and varnishing the ruled lines with waterproof varnish, deposit the sensitised emulsion upon this substratum. Such a plate is exposed in the camera through the transparent tinted support and developed as a positive, when, without further treatment, it reproduces to the eye the colours of the original object, more or less accurately, when viewed as a transparency. I may, in all cases, aid the reproduction of the original colours by the use of uniform colour screens inserted in the path of the rays falling on the plate, either for part of the time of the exposure, or during the whole time. Thus I may aid in the registration of the red rays by inserting a screen cutting off the shorter wave-lengths, more or less, for a portion or the whole time of the exposure.

Where the same finely distributed tints are used, both in taking and viewing the photographic image, these may not necessarily be deposited according to an accurate "pattern" upon the plate, but promiscuously, as in the form of a fine, flaky dust, let fall upon the plate, and protected by a waterproof varnish, or contained in a layer of gelatine maintained in a fluid state, while the dust is being deposited. The dust may consist of minute particles of glass, coloured in the requisite tints; or they may be impressed upon the plate, as previously described, by printing from a surface with a raised pattern; or such colours may be laid on in coloured fluxes, and burnt into the glass support. Again, such fluxes mixed with a suitable liquid may be ruled upon the plate in fine lines, as before described, and then burnt into the plate; or, by passing the plate under three successive rollers, with suitably spaced raised lines or spaces, the three colours may be deposited. In all these cases I may keep the plate at a raised temperature while putting in the colour, so as to facilitate the drying of the inks, and preserving the adjacent lines from running into each other.

The tints, red, green, and blue, carried by the view screen, are those of the fundamental colour sensations, approximating to the tint of the red lithium band of the spectrum for the red, to the green of the E-line region of the spectrum for the green, and to a lapis-lazuli blue for the blue. These are ruled upon the screen in such depths as will secure that the finished screen shows little or no colour to the unaided eye when looked at by transmitted light, but looking darkened or grey, due to the light absorption of the three tints. I may also depart from these tints somewhat when it may be requisite to do so, in order to secure that one and the same screen shall serve both for taking and viewing the picture. Or I may even add to the number of tints in accordance with same methods of composite photography, or use less than three tints when pictures of less variety of tints are required.

I find that the aniline dyes mixed with thin dilute gum arabic are suitable for ruling upon the plate, more especially if this is coated with a thin layer of clear gelatine which has been allowed to dry before the colours are ruled upon it. I use ordinary drawing pens with carefully set blades. These are conveniently provided with micrometer screws for adjusting the width of the lines. But generally it is requisite, by microscopic examination, to make sure that each line has the correct width. It is best to provide separate pens for each colour, and have these displaced relatively to each other by such an amount that the lines ruled by the leading pen are dry before the lines made by the second pen are deposited near them, and so also for the third set of lines. This displacement may either be at right angles to the direction of the lines or in the direction of the lines; at the conclusion of each stroke across the plate the plate or pens are shifted by the action of the screw of the dividing engine, through the width of three lines in a direction at right angles to the direction of the lines.

I may mix the dyes with gelatine, and rule this upon the plate, which may or may not be coated with a preliminary layer of gelatine; the aniline colours or other colouring matters may be dissolved in warm dilute gelatine and ruled on to the plate while in a fluid condition. In this case I maintain the pen or pens warm by the use of a spiral of platinum wire surrounding the upper part of the pen, so that when this is heated by an electric current the requisite temperature is maintained. Or I may warm the metal frame carrying the pen or pens by the use of gas jets, or other means. The plate to be ruled may be plain glass or carry a thin film of clear gelatine as a substratum. The plate may also be warmed, but I find it an advantage to let the gelatine cool sufficiently upon contact with the plate as to render it so far set that no running occurs. In this manner I may rule simultaneously the three colours in adjacent lines, only displacing the pens so much in the direction of the line as to allow of the setting of the one colour line before the next line is deposited alongside of it. Or I may arrange the pens in the manner already described.

I may use any convenient solvent for the dyes for making the inks, and any convenient substratum upon the plate, or I may dispense with this latter altogether. I may rule the lines upon celluloid or other transparent support.

The lines may be varied in width when it is desired to give prominence to one particular tint in the objects photographed. The width of the lines on both screens must, however, correspond. Thus if, to strengthen the reproduction of the red, for example, the red-selecting pigment on the taking screen is ruled somewhat wider than the green and blue-selecting pigments, then the lines on the view screen in the fundamental red colour must be correspondingly wider than those lines which carry the green and blue tints.

The lines on the view screen may, if necessary (as in the case of large plates), be ruled so much narrower than those on the taking screen as will allow for the shrinkage of the photographic film in the process of development, where this might amount to so much as to cause want of coincidence between the lines or other "pattern" upon the photographic image and upon the view screen. The colours of the view screen may underlie the sensitive film, being primarily deposited upon the glass support; the colours of the taking screen may be carried on the outside surface of the sensitive film, being deposited in exact register with the view colours beneath. The plate is exposed through these last colours, which wash off upon development. Or it may only carry the view colours, and be exposed through a removable "taking" screen. In these cases the plate is developed as a positive, when it may be viewed as a photograph in colours, owing to the presence of the visual screen beneath the film.

Or a negative of the image, being obtained by exposure beneath a taking screen (which may be carried ruled directly upon the surface of the sensitive film), is printed as a positive upon a plate carrying a view screen beneath its sensitive layer, the requisite correct register being secured by the use of stops, &c.

I may obtain the negative by means of the following arrangement, equivalent to a finely divided colour screen. A silvered glass plate, or a plate otherwise coated with a thin opaque film, as by a dark varnish, &c., has the opaque film removed in places according to pattern of fine, clear parallel lines, spaced at double their own width from each other. On the clean spaces are a little less than half the area or width of the opaque spaces. Such a plate may be formed by a dense photographic image, either by contact printing from such a semitransparent screen as described above, or by a reduced image of the required pattern from a larger surface or diagram. The semitransparent screen is so attached as to be superimposed upon, and movable through, a known small distance, across the surface of the sensitive film. Thus the image in the camera only reaches the sensitive film through the clear lines engraved upon the screen. In taking a photograph, the screen is shifted into three successive positions, each advance being through the width of one clear space or a little more, and at each advance a differently tinted, uniformly coloured screen is introduced in the path of the rays forming the image. These screens are such as will secure the proper registration of the several colours upon the plate. Or the engraved plate may have lines so spaced as to admit of two, four, or more coloured screens being used. Subsequently I view the photograph so obtained through a screen similarly ruled with the suitable transparent tints or imprint, or rule these tints directly upon the positive image. Or the opaque primrry screen may be cleaned or perforated according to any regular pattern engraved or photographed upon it, so that the entire surface of the sensitive plate, or nearly so, can be exposed by a number of shifts or movements of the screen corresponding to the number of plain colour tints used in taking the photograph. Subsequently the photograph so obtained is printed as a positive, and viewed through the screen of transparent tints spaced according to the pattern of the primary screen. The secondary screen may be subsequentlv imprinted or ruled upon the positive.

I may avoid or lessen the effects of parallax, due to the rays of the camera being divergent and the finely divided screen in some cases not being in optical contact with the sensitive surface, by placing the colours not in exact juxtaposition, but so that a minute distance separates the several colour plates or lines, the secondary screen being similarly divided; or I may only confer this minute separation upon the colours of one of the screens. Thus subsequently, when the photograph is looked at obliquely through the secondary screen, there will be less change of tints due to the parallax arising from the want of optical contact between the screen and the photograph. Or I may secure the absence of this effect in projecting upon the magic-lantern screen, by using a projecting lens of like focal length to that used in the camera when taking the photograph. I may use a semi-transparent screen upon the plane of which the image is formed, screen and image being again projected by a lens upon the sensitive plate. Or, for direct eye observation of the picture, I may regard it through a lens or lenses, so that the rays from the picture to the eye have the same divergence as obtained in the camera when the picture is being taken.

The image may be formed in the camera upon a particoloured screen larger than the sensitive plate, and a lens within the camera used to reduce both image and screen to the dimensions of the plate. In this way a very fine subdivision of the image may be secured. Subsequently, in viewing or projecting the image, a similar optical arrangement may be used.

Suitable frames can, of course, be constructed into which the taking and viewing screens may fit, and be at once in register relatively to one another.

It is obvious that any of the above-mentioned arrangements may be used in taking and viewing stereoscopic photographs.

Throughout the specification I have made use of the word "pattern," generally to denote any form whatever in which the colouring matters may be suitably distributed over the screen.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is :—1. Taking a photograph through a particoloured screen substantially as described. 2. A transparent screen for use in taking a photograph bearing a "pattern" in dyes or pigments having different selective light-absorption properties substantially as described. 3. A transparent screee bearing a "pattern" in the primary colours, substantially as described for usn in viewing a photographic image taken through a screen such as described in the preceding claim. 4. A transparent screen for use in taking and viewing a photograph bearing a "pattern" in the primary or approximately primary colours, and in such dyes or pigments as have suitable selective light-absorption properties, substantially as described. 5. In photography the subdivision of the image by means of a screen on which are lines ruled in several tints and in close juxtaposition, thereby producing compound colour sensations substantially as described. 6. An opaque screen for use in taking a photograph bearing a transparent "pattern" substantially as described. 7. The combination in a sensitive plate for use in photography of a "pattern" in the primary colours, a sensitive film, and a corresponding "pattern" on the surface of the sensitive film in suitable selective light-absorptive dyes or pigments substantially as described. 8. In a camera the combination of a uniform colour screen of suitable selecting tint, an opaque screen bearing a transparent "pattern," and a sensitive plate substantially as and for the purpose described. 9. The combination in a sensitive plate for use in photography of a sensitive film and a layer or stratum of promiscuously or regularly distributed colour dyes or pigments suitable for taking and also for viewing in the desired colours a photographic image. 10. The combination in a photographic camera of a lens to project an image upon a particoloured screen such as described, but larger than the sensitive film, and a reducing lens to focus the image formed upon the said screen on to the sensitive plate.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
19	Camera Club	Lantern Evening.
19	Central Photographic Club	*Modifying Bromide Prints by After-treatment.* W. Ethelbert Henry.
19	Glasgow and West of Scotland	
19	Leeds Photo. Society	*Lantern Slide-making by Reduction.* Godfrey Bingley.
19	North Middlesex	*Platinum Printing.*
19	Richmond	Show of Hand-camera Work.
19	South London	
20	Aintree and District	*A Trip to the Highlands.* D. J. Neill.
20	Birmingham Photo. Society	
20	Brixton and Clapham	*Flashlight Photography.* W. Thomas.
20	Derby	
20	Exeter	
20–22	Hackney	Exhibition at Morley Hall.
20	Hastings and St. Leonards	
20	Keighley and District	
20	North London	
20	Paisley	
20	Rochester	
20	West London	
21	Brechin	
21	Bury	
21	Croydon Camera Club	*The Carbon Printing Process.* Charles Moss.
21, 22	Ealing	Exhibition.
21	Leytonstone	
21	Manchester Camera Club	
21	Photographic Club	Smoking Concert.
21	Southport	
21	Southsea	
21	West Surrey	"Brook" Award, with Critical Notes by Colonel J. Gale.
22	Camera Club	*Vertical Camera Work.* T. C. Hepworth.
22	Dublin Y.M.C.A. Camera Club	Annual "At Home."
22	Glossop Dale	
22	Hull	
22	Ireland	*A Tour in Japan.* Miss White.
22	Leigh	Lantern Evening.
22	Liverpool Amateur	*Practical Hints on the Camera and its Use.* Mr. Anvon.
22	London and Provincial	*Impressions of Impressionism.* Thomas Bedding.
22	Oldham	
22	Putney	*Unconventional Printing Methods.* S. Herbert Fry.
23	Cardiff	
23	Central Photographic Club	*The Live Model.* Gleeson White.
23	Croydon Microscopical	
23	Holborn	
23	Maidstone	
24	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 13, Ordinary Meeting,—the President (Sir H. Trueman Wood, M.A.) in the chair.

The ballot was taken for fifty-six candidates for membership, and of these fifty-five were elected, the other candidate being declared by the President to have been "not elected."

The nomination papers of twenty-eight gentlemen to be balloted for at the December meeting were read.

Several gifts of books &c., to the Society having been announced, the President proceeded to the presentation of the medals awarded by the Judges of the recent Exhibition of the Society. He observed that, nowadays, no doubt, too many medals prevailed, but the medal of the Society had, for many years past, been looked upon as one of the highest prizes it could bestow. Their medals had gained lustre from those who had taken them, and they stood as high now as ever they did. This year's Exhibition was probably the best they had yet had, and those who had obtained medals had reason to congratulate themselves, as the Exhibition was fully representative of the present state of photographic art.

The President then handed their medals to Mr. T. M. Brownrigg, Mr. T. R. Dallmeyer, Mr. A. J. Golding, and Mr. J. A. Sinclair, the remaining gentlemen not being present to receive their awards.

A NEW LENS.

Mr. H. DENNIS TAYLOR read a paper on *A Simplified Form and Improved Type of Photographic Lens*, illustrating its principles and construction by means of diagrammatic lantern slides, and showing negatives taken with the lens. After referring to the distinctive properties of the new anastigmatic, and Concentric lenses which the new Jena glasses had rendered possible, he said that the lens he had devised had nothing to do with the new glass. This lens may be briefly described as of triplet form, the two outside lenses being simple positive lenses, and a third or negative lens being placed between them. Hitherto (said Mr. Taylor) flatness of field had been obtained by diaphragm corrections, but in the system he described this method of correction was discarded, and thrown on the negative lens. Having described the functions of the central corrector or negative lens as correcting the colour and spherical aberrations, and the curvature and astigmatism given by the outside positive lenses, Mr. Taylor proceeded to illustrate the construction and show the capabilities of three forms of lenses which he had worked out in accordance with the above system. The first of these consisted of a six-lens triplet working at *f*·7·8, but the difficulties and cost of construction would probably be as great as the Goerz lens. A portrait triplet, consisting of two simple outside plano-convex lenses of crown with a simple biconcave central negative lens worked at *f*·3·7, was then described, and finally a landscape lens working at *f*·5·6 which, it was understood, was the one to be adopted. Mr. Taylor having commented on the unevenness of illumination given at the edges of the plate by some of the modern lenses, also drew attention to the fact that two lenses of equal foci and professedly of equal aperture differed by the nature of their construction in effectiveness of aperture at the sides of the plate, and concluded by illustrating the capabilities of his new lens in copying.

Mr. W. TAYLOR said that his firm (Messrs. Taylor, Taylor, & Hobson, Leicester) had made arrangements to take up the lens described by Mr. Dennis Taylor. He might sum up the nature of the improvements obtained in a few words, by saying that the lens had the capacity of securing a plane image of a plane surface. The margins of the image would show definition comparable to the centre by simpler means than had been known before. He showed four negatives of a test screen, 4 ft. by 3 ft., with lines radial and at right angles, lettering, pictures, and other objects placed upon it, and having described the precautions taken to secure verticality and other conditions, concluded by congratulating Mr. Dennis Taylor on introducing a lens equalling anything that had preceded it.

Mr. J. TRAILL TAYLOR alluded to the apparently crossed lens which figured as one of the elements of Mr. Dennis Taylor's system, and said that the late Andrew Ross employed that form of lens as the front lens of a portrait combination. The tube was short, and the back lens had a large amount of negative aberration, which was obtained by reversing the position of the crown element so that the more convex side was outside instead of being inside. The late Mr. J. H. Dallmeyer had provisionally patented a triple combination of simple lenses at or about the time of the introduction of the triplet achromatic. Mr. Taylor concluded by remarking that an opera or field glass could be made with a single achromatic front and a simple concave eyepiece which would compare critically with the triple element of the twelve-lens form. He had examined one such, made by Messrs. Perken, Son, & Rayment, of a magnifying power of ten diameters, which bore out his statement.

Mr. W. E. DEBENHAM disagreed with a remark of Mr. Dennis Taylor's that critical definition was out of place in a portrait lens.

Mr. CONRAD BECK said that Mr. Dennis Taylor's lens seemed entirely novel, and the method of correction was such as was not in existence with any of the present lenses. Assuming that the centre lens equalled in power the sum of the other two, he asked how an image could be obtained. He congratulated Mr. Dennis Taylor on the new standpoint he had taken up.

After remarks by Mr. BOLAS and Mr. CHAPMAN JONES, Mr. T. R. Dallmeyer (who had taken the chair consequent upon the President having vacated it) said that he was aware that his late father had a lens composed of two single crown glasses, corrected by a central biconcave formed of a different glass to that of the outside lenses. He (the Chairman) had one in his possession now. The lens had been discarded on account of the flare spot it had given. Mr. Dennis Taylor appeared to have worked out a lens in theory which necessitated the forms employed; and it was to be hoped he had overcome the frightful flare spot which was the reason the late J. H. Dallmeyer had rejected a lens of similar form.

Mr. DENNIS TAYLOR replied to various points raised in the discussion. Alluding to the Ross crossed lens referred to by Mr. Traill Taylor, he said it was difficult to draw any analogy between double and single lenses similar in exterior form. As to Mr. Debenham's remark, he thought most photographers preferred a portrait lens with a residuum of aberration, and was of opinion that an ordinary portrait lens gave a definition as sharp as one saw the subject with the naked eye. He had never been troubled by any trace of a flare spot, and, as regards Mr. Beck's remark, said the assumed difficulty was obviated by the relative positions given in the three lenses in the tube. The middle lens performed very complex functions.

All the speakers congratulated Mr. Dennis Taylor on the advance he had made, Mr. WM. TAYLOR expressing satisfaction that our German cousins were not having all the optical honours to themselves. A hearty vote of thanks to Mr. Dennis Taylor terminated the proceedings.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 1,—Mr. E. W. Parfitt in the chair.

Mr. G. W. ATKINS presented a bracket to the Association to support the lantern during exhibitions of slides.

The HON. SECRETARY produced prints from two negatives taken with an ordinary uncorrected spectacle periscopic lens of about twenty inches focus—one taken at the visual focus, and the other when the sensitive surface had been racked in towards the lens about one-fortieth of its focus; the latter gave a sharp picture, whilst the former was fuzzy.

Mr. MOTE showed an untoned print upon matt P.O.P., made twelve months ago, and which was apparently unchanged.

Mr. W. D. WELFORD read a paper upon *Elastic Exhibition Rules* [see page 711, ante].

Discussion having been invited, Mr. W. E. DEBENHAM remarked that Mr. Welford had agreed to the rules in certain cases, he also said that certain of the Judges thought that their names might remain and yet be at liberty to stretch the rules. He went on to explain his position, and said that he had refused to sign with the other Judges because he understood that the whole of the rules must be observed; so far as the action of the Conference appeared to be in direction of reducing the number of medals, he pointed out that the No-medal system had been tried at the Pall Mall Exhibition and had failed. He considered that Mr. Welford should not have brought up this subject whilst still *sub judice*.

The HON. SECRETARY left Mr. Welford to take care of himself, but thought that he had done well in reading the paper, as, if he could not carry his views at the Conference, it was right to appeal to the societies. If a rule were found to be bad, then amend it; it was better to have rules than chaos.

Mr. C. H. COOKE had refused to send in pictures when he knew that certain persons would judge.

Mr. CHILD BAYLEY quoted two recent instances where the rules had been varied. At some of the minor exhibitions it seemed impossible to draw people without some form of entertainment, such as a band. Referring to the medal question, he added that the decision was not challenged, as a rule, when given for technical excellence; it was only when artistic qualities were in question that differences arose.

Mr. R. P. DRAGE defended Mr. Welford, and mentioned that, as the London and Provincial was one of the first to move in the affiliation scheme, it deserved to be made aware of what took place.

Mr. WELFORD replied that his first opponent had attempted to make an attack upon him, but his paper had not been intended to attack any one. When he advocated breaking the rules he expected opposition. He mentioned that he and Mr. Debenham were in the minority, and he had loyally abided by the ruling of the majority. Reverting to his remark about the "journalistic judge," he said that his position meant business for his paper.

NOVEMBER 8,—Mr. J. Traill Taylor in the chair.

Mr. H. T. Cook was unanimously elected a member of the Association.

Mrs. CATHERINE W. WARD (who was supported by the presence of several ladies) then gave her description of about 100 slides, projected upon the screen by the Association's lantern. The views comprised many of the cathedrals, castles, &c., of England, as well as scenes illustrative of *Eugene Aram*, *Cinderella*, &c., groups taken in her own studio in America, and portraits of notable Americans, such as Edison.

Mr. Chang also contributed some slides.

A vote of thanks to Mrs. Ward was carried by acclamation, and to which he suitably responded.

PHOTOGRAPHIC CLUB.

NOVEMBER 7,—At the Fifteenth Annual General Meeting, Mr. Frank Haes, a Trustee, was in the chair,

The HON. SECRETARY read the notice convening the meeting.

The HON. RECORDER read the minutes of the last annual meeting, which were confirmed.

The HON. SECRETARY read the annual report and balance-sheet for the year ending October 31, 1894.

Mr. BRIDGE proposed, Mr. NESBIT seconded, and it was unanimously resolved, that the report and balance-sheet be accepted and adopted.

The election of officers for the ensuing year resulted as follows:—*Trustees:* Messrs. Frank Haes and Alex. Cowan.—*Committee:* Messrs. F. A. Bridge, S. H. Fry, H. M. Hastings, A. Mackie, J. Nesbit, E. W. Parfitt, M. L. Troup, H. Wilmer.—*Librarian:* Mr. E. A. Newell.—*Lanternist:* Mr. R. R. Beard.—*Editor of the Club's Transactions:* Mr. T. Bedding.—*Recorder and Curator:* Mr. G. W. Tottem.—*Hon. Secretary and Treasurer:* Mr. J. A. Sinclair. Messrs. Hunt and Williams acted as Scrutineers.

Mr. BRIDGE proposed that a hearty vote of thanks be passed to the officers of the Club.

Mr. FOXLEE seconded, and it was unanimously carried.

Mr. HAES, Mr. SINCLAIR, and Mr. TOTTEM returned thanks for the vote passed.

Mr. BRIDGE proposed a vote of thanks to Mr. Bedding for editing the Club's transactions.

Mr. TOTTEM seconded the proposal, and it was unanimously carried.

Mr. BEDDING, in his reply, said, that whilst members were willing, it would be a pleasant duty to him.

Mr. COWAN (co-Trustee with Mr. Haes) proposed that no money be invested this year.

Mr. BEDDING seconded, and it was carried unanimously.

The CHAIRMAN proposed, on behalf of Mr. Weir Brown and himself, that ladies be invited to attend on those evenings set down on the programme as Travellers' Nights.

Mr. BRIDGE seconded.

On being put to the vote, the proposal was not carried.

Mr. A. W. Isenthal was unanimously elected a member of the Club.

Mr. NESBIT proposed a very hearty vote of thanks be passed to Mr. Haes for the manner in which he had conducted the meeting, which was carried unanimously.

Mr. HAES, in replying, said that his duties were light, but his services were always at the disposal of the Club. He congratulated members on the satisfactory state of the balance-sheet, and urged members to induce their friends to join.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THIS Society held their Monthly Meeting in the Rooms at 36 George-street, on Thursday, the 8th inst., this being the first meeting since the General Meeting and election of officers. The newly elected President (Mr. H. M. Whitefield) was in the chair; as is the custom, the PRESIDENT gave a short address, which was concise and to the point. He mentioned, amongst other things, that, although we had some excellent workers, we somehow lacked experimentalists, and he trusted that, during the coming session, a few evenings would be taken up by some of the members demonstrating various experiments they have made. He then called upon Mr. E. H. Turner to read his paper and show his apparatus for "reducing" and copying by gaslight.

The Lecturer had some good apparatus, which he clearly explained to the members, and, although the idea of using the gaslight in the manner he showed is somewhat ancient, still, the way in which he had got his tackle together, and the various experiments made during the evening, showed to all present that the idea could be worked out and that it was practical.

A hearty vote of thanks was passed to the Lecturer, who replied in a suitable manner. The attendance during the evening was one of the best on record.

The following gentlemen were elected members of the Society: Mr. C. H. Clemson, Mr. J. Makin.

The next Meeting takes place on the second Thursday in December.

Brixton and Clapham Camera Club.—November 6, Dr. J. Reynolds (President) in the chair.—Mr. R. G. Mason gave a demonstration with the lantern microscope, for which he was awarded a hearty vote of thanks. The Secretary then announced that Mrs. Rejlander, the widow of the great photographer of that name, being in necessitous circumstances, it was the intention of persons interested in her welfare to circulate a series of slides made from her husband's negatives. Such slides had been obtained and were passed through the Club lanterns, after which a collection was made for Mrs. Rejlander. The contributions amounted to 1*l.* 2*s.* 6*d.*

Croydon Camera Club.—The Braithwaite Hall was, in spite of its being a pouring wet night, well packed on Wednesday, November 7, when Mr. HORATIO NELSON KING described, by word and picture, many of the state and home apartments in which our Royal Family pass most of their lives. That the photographic slides were of the highest quality may be well imagined, for Mr. King is one of photography's fathers; the friend of Scott Archer and Fox Talbot, some of his photographs shown on the screen were taken in their company as many as forty-three years ago. The running fire of anecdote, which threw many interesting sidelights upon the habits and lives of our "Royals," was greatly enjoyed, as were several photographic references. Thus Mr. King stated that, when the Prince Albert mausoleum was being built, the Queen had a photograph of it taken *every day* and sent to her, in order that she might, by ocular evidence, satisfy herself as to the progress that was being made. This took place some thirty years ago, since when others, viz., engineers and builders, have followed the lead. Mr. King, with the virility of a successful man, spoke somewhat slightingly of a large class of amateurs who aim at obtaining a camera weighing about an ounce and a half, and, having taken their view, need other folk to "do the rest" for them. Mr. King usually carries a 12×10 camera, and still, on occasion, walks his twenty-five miles a day in search of the beautiful. The loud and prolonged applause, which, at the instance of Mr. Maclean (the President of the Croydon Camera Club), was forthcoming at the end of the lecture, testified how warmly the audience appreciated the efforts of one gifted both with photographic and lingual eloquence. The concluding portion, which consisted entirely of slides by members of the Croydon Camera Club, does not call for detailed notice, except to call attention to the clever snap-shots by George Corden of the lady cricketers playing against an eleven of Addiscombe. These gave unusual satisfaction, and seemed provocative of much mirthfulness. Amongst others whose views "caught on" were Messrs. Albert and G. W. Jenkins, A. J. Noaks, jun., J. Lock, and A. E. Isaac, *The Forge*, by the last-named, being particularly well received. In the course of the evening, the PRESIDENT, who described the above slides on behalf of the various members, contrasted the degraded smudges which constitute newspaper reproductions of photographs with the glorification and magnification of photographic actuality and art by means of the optical lantern. He also paid a well-deserved compliment to Messrs. Cole and Hirst, who between them provided and arranged the apparatus, and worked the lantern in a very perfect fashion.

Ealing Photographic Society.—November 8, at the Public Building, Ealing, Mr. H. W. Peal in the chair.—A practical demonstration of the working of the Photo-autocopyist was given by Mr. TAYLOR, of the Autocopyist Company, and his assistant. They showed that with a little experience this is a simple and cheap process of obtaining many prints from one negative, these prints being permanent. They also showed the working of the autocopyist, which is part of the above, and which copies anything written on paper with an ordinary pen, special ink only being required. Numerous questions were asked and satisfactorily answered, and a hearty vote of thanks to Mr. Taylor was passed.

Hackney Photographic Society.—November 6, Mr. A. Barker presiding.—In answer to an inquiry for a good formula for developing hand-camera negatives with amidol, the following was recommended:—Sodium sulphite, sat. sol., 1 drachm; amidol, 2 grains; water to 1 ounce. Restrain either with sodium

acetate or citrate. Mr. T. H. Smith asked for an opinion as to the best way of making a good lantern slide from a hard negative. The Chairman, in reply, advised giving full exposure and subsequently using a weak developer. Mr, Westcott showed a lantern slide which illustrated the advantage of backing the negative plate with caramel. In the subject in question the full sun had been photographed, and, although, by accident, seven or eight seconds' exposure had been given, no halation was shown. In answer to a query as to removing green iridescent fog from a negative, Mr. R. Beckett advised rubbing the dry negative with wash leather damped with methylated spirit. Members' lantern slides were then shown on the screen for trial and criticism. Mr. Howard Cricks showed the "Automatic Enlarging and Reducing Apparatus." This consists of an oblong box, containing a lens which works at fixed focus. By means of grooves and carriers to vary the relative distances apart of the negative, lens, and positive surface, enlargements may be made from quarter-plate upwards to 10×8 in the smallest size instrument, and to all standard sizes up to 20×16 in the largest. Lantern slides can be reduced from whole-plate and half-plate negatives. The instruments are made in four sizes, from 2*l.* 7*s.* 6*d.* to 4*l.* 10*s.* No focussing is required and the necessary operations for enlarging or reducing are very simple.

West Surrey Photographic Society.—November 7, Ordinary Meeting, Mr. G. H. James in the chair.—Mr. T. Charters White, M.R.C.S., F.R.M.S., gave a *Photo-micrographic Gossip*, and exhibited a series of eighty-four slides. In commencing, he pointed out that, whilst the microscope itself was the source of much intellectual enjoyment, it could only be used by one person at a time, whilst, when photography came to its aid, the same object could be enjoyed by a roomful of people. Another hindrance to its use was that those unaccustomed to its use had great difficulty in getting an accurate focus, especially when using the higher powers, and that the glare of light often prevented the casual observer from grasping the many interesting and instructive details revealed by its use. The first slide shown was a photograph of the instrument used by Mr. White in the production of the photo-micrographs which were afterwards exhibited, which, commencing with some of the simplest forms of life, introduced to a most attentive audience diatoms, sections of cartilage, bone and skin, parasites, including the too-well-known *pulex irritans*, pond life, &c. The evening passed very rapidly, so much so that at the end there was no time for a discussion after the last slide was passed through the lantern. A very hearty and unanimous vote of thanks to the lecturer closed the proceedings.

Leytonstone Camera Club.—November 8.—A lecture was given before the above Club by Mr. Remhold Thiele (of Symmons & Thiele) on *Retouching*. The lecturer proceeded on very novel lines by placing a negative in the lantern and projecting the portrait on a white screen. Working with a stump, he thus enabled the whole of the members present to follow his working. Mr. Thiele said it was absolutely necessary to have a good retouching medium, and he would suggest the use of H.B. and H. pencils. He could not, however, give hard-and-fast rules on this subject, as some workers had a lighter touch than others, and could consequently work with a softer pencil. The lines of the face should always be followed, the procedure being first to fill in—that is, to do away with all pimples and marks in the face—after which the retouching proper would follow, the grain so much admired resulting from the fact that the whole of the surface is not worked upon by the pencil, the spaces between the pencil markings printing darker on the print. In reference to spotting, he would recommend the ordinary albumen colours sold for the purpose—either crimson, lake, or black—the operator taking care that the colour covers a lesser space than it is desired to cover, and thus prevent the colour from getting over the sides of the hole.

Leigh Photographic Society.—November 8, the President (Mr. M. F. Burrows) presided.—The Seascape Competition did not attract many entries, but the work was exceptionally good. Mr. T. Haddock was again successful in being awarded the first prize for a beautiful vignetted platinotype of *Port Madoc*, with suitable sky effect. Mr. M. F. Burrows gained the second and third prizes; Mr. W. Hampson's *View of Douglas Head* and Mr. W. R. Moore's *View of Port William Bay* are worthy of special mention. The developing demonstration took place. The negatives were supplied by Mr. R. Leigh. Messrs. Burrows, Haddock, and Hampton demonstrated. Arrangements were made for the purchase of developing sink, lamp, dishes, &c. for the Society's dark room.

FORTHCOMING EXHIBITIONS.

1894.		
November 16, 17.....		Ashton-under-Lyne. R. T. Marsland, 24, Park-parade, Ashton-under-Lyne.
,,	20–22.....	*Hackney Photographic Society. W. Fenton-Jones, 12, King Edward's-road, South Hackney.
,,	21, 22 ...	*Ealing Photographic Society. R. Y. Murphy, 7, Argyle-road, Ealing.
,,	29, 30 ...	Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,,	23–Dec. 1	*Stanley Show (Photographic Section).
,,	27–Dec. 1	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
	29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytoustone.
December 3, 4.....		North Middlesex Photographic Society.
1895.		
March 25–30		Brixton and Clapham Camera Club.

Those marked * have Open Classes.

Correspondence.

DISEASED EMULSIONS.

To the Editor.

Sir,—In your issue of September 21, and in one of the Jottings from the ever-fertile pen of "Cosmos," mention is made of a theory which the writer had heard advanced as an explanation of the obscure cause of the deterioration of unexposed plates. The theory, viz., decomposition of the gelatine by microbial life, resulting in a further action upon the silver haloid, producing, on development, general fog, may, upon first consideration, appear somewhat plausible. Truly this is an age of microbial controversy, and the poor bacillus is almost daily being blamed as the active agent in bringing about obscure changes hitherto unexplainable.

Now, sir, I do not intend to oppugn this theory, for the simple reason that my bacteriological erudition does not extend so far as the domain of photographic emulsion. At the same time I submit that there really is no risk of microbial infection becoming a serious fact after the emulsion is spread upon glass, as air-borne germs, capable of growing in such a medium—if such there be—would have their action limited, not only to the particular spot upon which they had fallen, but also limited in point of time by reason of the abstraction of the moisture—so essential to their growth—in the drying room or chamber. However, whilst reviewing the bacteria as an invisible army of organisms utterly powerless to influence the stability or modify the character of normal emulsions which have reached the stage specified above, I cannot but strongly incline towards the opinion that certain species may be capable of producing very baneful effects in the earlier stages of the preparation of commercial gelatine emulsions.

I suppose that manufacturers of photographic emulsions, like manufacturers of many other somewhat unstable chemical preparations, experience more or less frequent failures of unaccountable origin; and, as the subject of the possible influence of micro-organisms upon this product has been broached in your columns, I should be grateful if you will favour me with the opportunity of expressing my willingness to prosecute the study of this subject. But, in order to do so, genuine samples must first be obtained. I should, therefore, esteem it a favour if any manufacturer would forward me a small sample, say, a quarter of an ounce, of any gelatine emulsion known to have "gone wrong," unaccountably, in its early stage of preparation.

I may add that I am not in the least degree anxious to know whence the samples may have come, neither do I desire to become acquainted with the proportions of their constituents; consequently I have taken the precaution of specifying "small samples." Should the investigation tend to the elucidation of this problem, I shall be only too pleased to publish the results for the benefit of those whom they mostly concern.

Thanking you in anticipation of the insertion of this note,—I am, yours, &c., A. J. Banks.

42, *Wilmington-square, London, W.C., November* 13, 1894.

"STARCH PASTE THE CAUSE OF FADING OF SILVER PRINTS."

To the Editor.

Sir,—This old subject has again cropped up, this time in your "American Notes and News," in which a writer in the *American Amateur Photographer* states it as his opinion that "it is the malicious starch paste that has faded the greater part of our prints during the past twenty years," a statement which I myself fully endorse. But you question this statement, and go on to say that, "if prints mounted with starch have remained good for thirteen years, there cannot be much to militate against it;" and you go on to state, "We know too well that prints mounted with fresh well-made starch paste have, in many cases, showed indications of fading within a few weeks after mounting, but it has never been brought home to such starch that it exercises a *chemical* action upon the material of which the print is composed."

This is scarcely true, for, when this question was discussed in The British Journal of Photography some twenty or more years ago, I then explained a theory of why starch-mounted prints were liable to fade, and I think it will bear repeating at the present time, viz., it is a well-known fact that starch paste, however well made, will, if not soon used, become *sour*, owing to fermentation, and the consequent formation of acetic acid.

Now, the same will apply to the starch paste *after* use in mounting, when it has become imprisoned between the print and cardboard, *provided the conditions are favourable to bring about fermentation*, which is more often the case than may be supposed. The most favourable conditions to bring about this result are *alternate moisture* and *warmth*. Suppose that a carefully prepared silver print has been mounted with good fresh starch paste, and, after being properly dried, it be placed in a frame and hung upon a wall of a room liable to damp (a very common thing), and that in cold

weather at least a fire be kept up during the daytime and part of the night. It will be evident that here we have the exact conditions favourable to bring about fermentation, and its consequent formation of acetic acid, hence fading of the print.

This is a question of far greater importance now that gelatine papers have partly replaced albumenised papers in printing.—I am, yours, &c.,

THOMAS FORREST.

Cambrian Studio, Pontypridd, November 6, 1894.

DARK-ROOM ILLUMINATION.

To the EDITOR.

SIR,—Referring to your article in last number of THE BRITISH JOURNAL OF PHOTOGRAPHY in regard to lighting in the dark room, I would say that I have long ago sought a good, safe lantern to burn gas. Of course, if I had wanted a big concern without regard to expense, I suppose it was easy enough. I have used one for a long time, but it was small, and, if I used the flame inside above a certain small-sized one, the heat was enough to melt the soldering. I found one lately which, however, is not new, as it is advertised in several catalogues of English and French firms, but it seemed to meet my wants. It is composed of an iron and brass stand, an argand burner, with a red chimney and light-tight brass work at top and bottom. However, after a very little trial, I found the defects so great that I had to give it up. The fact was that, burning only a flame of one inch high, which should have given plenty of light, this was, nevertheless, very unsatisfactory; first on account of the bad light it gave, in reality only one quarter of the whole being actually of use, the other three-quarters being lost on the other sides; but second, and not least, the heat given off is unbearable, and not only the chimney gets awfully hot, but the stand also, so that the rubber is liable to melt, or continuously spoiled. Of course I mean the rubber tubing connecting the stand with gas fixtures. I found a way out of it which may not be new; but, having not seen it published before, I do not want any one to patent it, therefore give it to you for publication, if you think it worth while, and I believe it is. I simply replace the argand burner by another one, which I found ready-made, and composed as follows: The top is flat, and pierced with three very small pinholes placed in a triangle, about one-sixteenth of an inch apart (maybe one or two of such holes would suffice). This, when lit, gives a flame from low down up to twelve inches long or more, according to gas pressure. The height is easily regulated by the key, and the width of the flame is only about one-quarter inch in diameter. In this case, as you can see, the whole of the flame is put to actual use without any danger of too much light getting to the plates, each part of the chimney being brought into play, and no extraordinary light centering on a certain point to create danger of too much of it. A flame of about two to three inches is generally sufficient. Another great improvement is the much smaller heat given off, and so much so, that after half an hour's work the chimney can easily be removed by hand from the lower part, and the stand remains cool.—I am, yours &c.

Asnières, Nov. 10, 1894. A. LEVY.

MR. GOLDINGS'S PICTURE.

To the EDITOR.

SIR,—Does not Mr. A. Golding, in your issue of last week, show himself a trifle over-sensitive about his charming photograph, *Where Sea Meets Land in Daily Strife*? Mr. Golding has the satisfaction of having produced, by purely photographic means, work so pictorial and artistic, that the critics, while compelled to admire, were also forced to doubt. What a delightful position for an enthusiastic photographer to occupy! What exhibitor could desire a better fate! Virtue in his head and heart; the honest negative in hand, Mr. A. Horsley Hinton for his friend and champion: publicity and triumphant vindication; the crowns of laurel falling in showers about him. And yet he is not happy!! He suggests further investigations on my behalf, or on his own; but I am perfectly satisfied, and certainly he ought to be.

Here is the extract from the *Times* of September 24, in which paper the suggestion of hand work on the picture was first publicly made:—

EXTRACT FROM THE "TIMES."

"We meet with many names among the general list of exhibitors which are well known as those of exhibitors of long standing. Mr. A. Golding, Col. Gale, and Messrs. Hall-Edwards, Birt Acres, Henry Bennett, Chas. Moss, W. Von Gloeden, J. C. Burrow, J. W. Holcome, and others, exhibit much capable work. In the exhibit of the first-named, to which the Society's medal has been awarded, there are strong symptoms of considerable painting on the print in portions which contribute largely to the effect of the picture. If this is so, in the face of a distinct condemnation of such a practice in the preliminary circular, it may reasonably give rise to a protest. Such things are, however, nowadays extremely difficult to detect, and there are methods of rephotographing, the use of rough paper, and the like, which increase the difficulty. *On the other hand, if nothing of the kind has been done, the effect of the tufts of grass against the sky line is a tour-de-force in technical work which is rarely accomplished.*"

If free criticism of photographs is permitted, the whole of its comments are fair, and should content Mr. Golding perfectly, seeing he had triumphant proofs that he was entitled to the splendid praise of the three lines in italics. Upon his success I also heartily congratulate him.

W. S. BIRD.

A GROWL FROM THE ANTIPODES.

To the EDITOR.

SIR,—Will you afford space to one in this far-off part of the world to ventilate a grievance or two, with a view to having them remedied?

The first refers to *bromide paper* as sent out by one of the largest and most popular firms in England. Some gentlemen interested in photography here procured a considerable quantity of it, with a view to both contact printing and enlarging, they found, on opening the packages, that the outer sheets were discoloured to the depth of, sometimes, three sheets on each side, involving a loss of half the packet; the marks were of a colour and appearance which led them to believe they were the result of the brown paper in which the other sheets were wrapped, either due to some injurious material in the substance of the paper or owing to the light penetrating through the wrappings. I noticed that the American Solio paper is wrapped in thick *black* paper which seems quite light-proof. It has been suggested that wrappings of *waxed* paper would protect the sheets from injury by the brown paper, if it were placed inside of it, but, if the discolouration is the result of penetration by the light, the waxed (white) paper would be useless. The discolouration was not the only trouble which beset us in our attempts to work the bromide paper, for no matter what the exposure, developer, or mode of manipulation, there was no such thing as a pure light to be got in the picture. Ferrous oxalate, amidol, metol, and other developers were tried, but without the desired result. Various formulæ were adopted, and care exercised, but the lights were always degraded by a deposit of silver. One of my friends said, "Why do not the makers send out an absolutely reliable formula for the development of their papers?" I presume, of course, that the formula sent is regarded as such, but it could not be got to work with us. I would only add, that the workers were not mere triers, for they had been to the metropolis and got lessons in this branch of the art especially.

In the matter of *cameras* one would have supposed there was littel room for improvement, but I think it would be a great advantage if the taper or conical body were *always* made of sufficient *width* in front to take a pair of stereo lenses; at present, if you want to use these, you must purchase a square-bodied one—and these are often so bulky that they occupy much space, and are heavy. A friend of mine who saw me working with a square half-plate recently asked me if it would not take *whole*-plates? In the matter of *size*, I noticed a considerable difference according to whom is the maker. At a recent outing, where there were about half a dozen half-plate cameras, there was one which measured nearly an inch each way less than the others, and yet had all the movement of the others including a reversible back—one point of superiority was in the smaller folds of the bellows, and the bulkiest of the instruments frequently cut off a portion of the end of the picture, owing to the intrusion of the folds upon the field, and it appeared difficult to suggest any remedy. I do not know who was the maker of the neat compact instrument referred to above, for our colonial dealers have a practice of substituting their own names for those of the manufacturers, who should stamp or engrave it upon some permanent portion of the metal fittings.

Lenses.—I have been longing for the day to arrive when opticians would contrive a simple, portable lens *mount*. A closely folded, neat, light camera, with a massively mounted rapid rectilinear lens, is an anomaly, and looks as much out of place as a dray horse in a trotting palky. Of course I am aware that it is necessary to use the combination with a definite amount of separation (although even that it is said not to be absolutely necessary), but could not a sliding or collapsible mount be designed? In the case of the iris diaphragm the tube would probably have to be in three pieces, the two ends sliding into the central part (outside). When hoods were used, they could also be made to slip back, and a much smaller hood could be used, because by slipping it back none of the field need be cut off. By this means, or something on these lines, part of the bulk could be reduced. For many years I had a sort of recessed front, which went inside the folds of the closed camera, till it nearly touched the ground glass. When the apparatus was closed the lens did not project—it was possible also to take it out and reverse it—projecture outwards—thus adding some inches to the extension of the camera.

Developers.—The man who discovers a satisfactory preservative for eikonogen, amidol, metol &c., which will not impair their efficacy, not be too dear, and procurable from all dealers in photographic goods, will secure the blessings of the photographic fraternity, amateurs especially. I fear people often recommend things which are only efficacious under certain conditions. I find in this hot, damp climate many of the chemicals in use deteriorate very rapidly. Some time ago I found spirits of wine recommended for preserving pyro and also hydroquinone, but they both turned as black as ink in a few days.

I trust I am not occupying too much of your valuable space; but we are far from the centres of photographic activity here, and cannot compare notes with, and obtain wrinkles from, our fellows; therefore I seek them through your well-recognised pages.—I am yours, &c.

Lismore, N. S. Wales, October 4, 1894. A. J. SIMPSON.

STANDARD LENS SCREWS.

To the EDITOR.

SIR,—We are making another effort during the coming winter to further the establishment of standard screws for lenses by converting to the standards of the Royal Photographic Society the fittings of any lenses which may be sent to us for that purpose.

This is the best of all ways of truly establishing the standards, because it increases the number of photographers who will ever refuse any other fittings. We therefore hope to have your kind assistance in making this known.

Of course few photographers would expend even the small sum necessary in altering their fittings merely to exchange one set of screws for another different only in size; but, when the full conveniences of interchangeability or uniform zeroes, and the perfect facility of engagement of our screws are known, it will be seen that they are a powerful factor in establishing in common use the Royal Photographic Society's standards.—We are, yours, &c., TAYLOR, TAYLOR, & HOBSON.

Leicester, November 13, 1894.

[The importance and excellence of this system scarcely needs endorsement from us, as we have already spoken greatly in favour of it.—ED.]

Exchange Column.

Ross's eight-inch Concentric lens, iris diaphragm, and yellow worked glass cap, will exchange for seven-inch Ross's Goerz, with iris.—Address, J. ELLIOTT, 4, the Beacon, Exmouth.

Walter Tyler's sunlight lantern and slides, and all requisites for oil and limelight, twelve-feet sheet; also 8×10 rolling-press (plate wants reburnishing), in exchange for half-plate or whole-plate camera and slides, or good table and chairs for studio.—Address, HARRY EBURY, Kidderminster.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

RECEIVED.—Imperial Dry Plate Company. In our next.

G. and G. (Glasgow).—Try Frith & Co., Reigate; Mansell & Co., Oxford-street; Marion & Co., Soho-square. Failing these, an advertisement would, we think, be necessary.

E. MORRIS.—Better get those who do the work to do the fixing also, otherwise you, being inexperienced in it, may spoil the pictures. If the pictures are framed, where is the need of this so-called fixing?

AMIDOL.—Possibly by the use of boiled water that has been allowed to cool your difficulty will disappear. We have used the brand of chemical named, and have found it keep well when made in the manner indicated.

PLATINOTYPE says: "I shall be obliged if you will kindly say the method (if any) of intensifying finished platinum prints."—In reply: See the JOURNAL for April 6 last, in which is given Mr. Dollond's method of depositing gold on platinum prints by means of a metol developing solution.

LEEDS.—Evidently the lenses of the combination have become partially uncemented. They can be separated by the judicious application of heat, the old balsam cleaned off, and then recemented, when the lens will be as good as ever. If you are not *au fait* at such work, it will be better to send the lenses to an optician.

G. W. H. says: "Thanks for previous answer. Can you now tell me, if a book of thirty or more photographs is registered and published, would it not secure every photograph or print in it from piracy the same as an ordinary written book."—Each illustration must be registered separate, for each is a separate and distinct work.

C. B.—Unless there is any special agreement to the contrary, as the assistant was paid weekly, he (or she) can leave by giving a week's notice. There is nothing to prevent him (or her) from entering the service of another in the immediate neighbourhood, unless there is any legal agreement which prohibits it. Length of service tells for nothing in such a case.

C. A. X.—Amber dissolved in chloroform is an excellent varnish for negatives, and it has the advantage that it dries bright and clear without the necessity of the negative being made warm before its application. Dammar resin dissolved in benzole possesses the same property (cold application), but the film it gives is not so hard and durable as that by the amber varnish.

W. W. A.—We should certainly advise you, as a novice, and having gas in your house, to adopt at first the blow-through jet in preference to any other. That jet will give sufficient light for any size screen that can be used in any small private house. After experience has been gained with it the mixed jet can be substituted for lectures at the penny readings at the local hall.

ARGENTIC.—It is not stated what light is to be employed. If an artificial light be used, a double condenser will be best. The size of the enlargement has nothing to do with the condenser, it is the size of the negative to be enlarged that has to be considered. So long as the condenser is large enough to evenly illuminate it, the enlargement may be as great as you please.

GEO. HOLLOWAY.—The five queries are of such an extremely elementary character that we cannot devote the space to answer them in such a way as to be of any value to you. Any elementary work, such as a shilling manual, will give all the information on the questions that it is possible to do in print. As quite a novice, it may be worth your while to get a few lessons in photography.

ECONOMIC.—To utilise the glass of old negatives the film must be cleaned off. In the case of gelatine negatives this may be done by soaking them for a day or so in cold water, and then immersing them in hot water. In the case of varnished collodion negatives, soak them in a tolerably strong solution of American potash, or a strong solution of washing soda, for a few days, and then clean the glass in the ordinary way.

ALPHO.—The firm in question (Goupil), we believe, work more than one process of photogravure; but they, of course, like others, do not publish the details of, or, indeed, anything about them. By the so-called Talbot Klic process good results are produced, as the prints in the Exhibitions prove, but we cannot say whether the published method of working it is that followed by commercial workers who produce the finest results.

S. W. (Llandudno) writes: "Will you kindly inform me whether a photographer has the right to 'copyright' a photograph of a customer without the consent of the customer, providing the customer comes and orders and pays for photographs in the usual way of business, and no mention is made of any intention to 'copyright' the photograph?"—No, unless the sitter gives permission. The photographer has been paid for his work. What more can he want?

C. ROMER.—As you say you are "employing the most rapid plates in the market," and all the "instantaneous" negatives are under-exposed, the only remedy is to give a longer exposure, or to use a larger stop in the lens, even at the sacrifice of definition over the whole of the picture. It must not be expected in November to obtain fully exposed negatives under such conditions of light and exposure as obtained a few months ago. Increase the aperture of the lens and slow the shutter, that is the only advice that can be offered.

R. C. CAVE.—If you can make dry plates that are quicker and better than any now in the market, you will find no difficulty in obtaining employment. Most makers would be glad, we surmise, of such services; but they will, of course, require substantial proof that you can do what you say, and on a commercial scale too. The technical classes certificate will not help much, if anything, in such a matter as this. A few plates that will prove what is asserted will be more valuable with manufacturers than any number of "technical certificates."

HARRY.—The albumen process has been published over and over again. It is quite true that the transparencies by it have never yet been surpassed, but, if not quite, they can nearly be equalled by other processes which are much more convenient to work—gelatine plates, for example, or collodio-bromide—and require far less skill and experience. Therefore, why should the necessary space be devoted to again publishing the working details of a process which would be of little interest to the majority of our readers, and which they are not likely to adopt?

C. W. S. writes as follows: "I cannot get my toning bath to work evenly, and should be glad if you would tell me the reason: 1. Why is it that after filtering bath sometimes twice with double filter paper, it is no clearer? 2. Is the bath being dirty the cause of it not working all right? The prints do not tone at all seemingly in the bath, but immediately they are put in the salt water they appear mealy and over-toned. 3. How often ought I to put acetate in bath? I use acetate of soda and gold (Johnson's)."—1. Possibly the filter paper is at fault. 2. Because the bath may not be perfectly clear it is no reason why it may not tone properly. It is quite possible that the paper used is not fitted for the toning bath employed. Some papers are very refractory in the toning bath. 3. That depends upon the number of prints toned in it. A little now and then.

*** Many answers to correspondents, articles, papers, reports, &c., have had to be held over.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1803. Vol. XLI.—NOVEMBER 23, 1894.

TRIPLE LENSES—PAST AND PRESENT.

By a triple lens, in the sense of which we are now to speak of them, is meant two positive lenses separated at some distance apart, with a negative lens between them.

The first triple lens of which we have any knowledge is that of Frederick Scott Archer, the inventor of the collodion process. Archer was a good chemist and a good optician, and devised at least one entirely new lens, a doublet which worked at full aperture, altogether different from the Petzval combination. To this last-named lens he, in 1853, had adapted a simple concave lens, which was fitted in a body of the tube where the diaphragm would be inserted. By this addition the focus was lengthened, and a larger picture capable of being made, with freedom from distortion.

As regards triple compounds, here the matter rested until, in 1858, our honoured predecessor in the editorial chair of this Journal, Mr. George Shadbolt, suggested the practicability of producing "a useful landscape combination by means of a couple of single convex lenses at each end of a short tube, corrected by a smaller concave of flint glass in a central diaphragm."

The seed thus cast into the ground soon began to germinate. First of all came Thomas Sutton, who suggested that, instead of single positive lenses at each end of the tube, they should consist of achromatic ones of the usual landscape lens form. Perfect symmetry in every respect was insisted upon in order to secure absolute freedom from distortion, the negative power of the central concave being equal to the positive power of either of the others.

Some people are inclined to give Sutton all the credit of inventing the triple compound, but to this, as we have shown, he is not entitled. He is, however, entitled to the credit of having kept the lens for a considerable time before the public through the agency of the *Journal of the Photographic Society* and his own "Notes." He also brought it to the notice of the British Association. The lens was first introduced in February 1859. The centre negative lens, he suggested, should be constructed of rock crystal, having surfaces of equal radius, and of nearly equal focus to the front lens, so that the focus of the whole combination was the same as that of the back lens alone. Sutton at first insisted upon absolute mechanical symmetry in the lens as one of the conditions under which perfect freedom from distortion was alone obtainable.

Not so, however, thought Goddard, a working optician of that period, and of a very original and inventive turn of mind. About that time (1860) the Photographic Society of Scotland had appointed a committee to procure, examine, and report upon the characteristics of various new lenses that had recently been introduced, and, amongst others, sent by Grubb, Ross, Voigtlander, Goddard, and others, was one by the last-named optician, of a form differing from any of the others. Upon dissection, we found that, while there was a seeming similarity to Sutton's triplet, it differed in detail of construction.

The points of similarity were that the front and back elements of the combination were of similar foci, and that the negative power of the central lens equalled either. The dissimilar points were a total departure from the mechanical symmetry so strongly insisted upon by Sutton; the front lens was a nearly flat achromatic, the flatter surface being slightly concave, while the back lens was a very deep, simple meniscus—that is, it was formed of one piece of crown glass only. The centre concave was not literally centrally placed, but was set much nearer to the front than to the back lens. It was double concave, but of unequal curves, the shallower curvature being towards the front. It was formed of light flint. The tube in which these lenses were mounted being short, a very wide angle of view was included, and there was absolutely no distortion. By a misapprehension of the jurors, it was, in the report subsequently submitted, described as "Sutton's" triplet. Goddard died just afterwards, and hence were terminated investigations of a most interesting nature.

The triple achromatic of J. H. Dallmeyer followed next. It was introduced in 1860. While possessing some similarity to the others just spoken of, it differed from them in detail. First, all the three lenses were achromatic *per se*. The front and back differed in a slight measure in foci, the front being rather the smaller and more powerful of the two, while the centre concave was, negatively, of about the same power as the back lens. All three were slightly meniscus, the flatter side of the negative lens being towards the front lens, from which it was separated by but a short space. Modifications were introduced by other makers, the only readily discoverable one consisting in making all the flatter surfaces quite flat, instead of with the curved surfaces preferred by Dallmeyer. This optician subsequently (in 1866) applied for two patents for triple lenses, in which all three elements were of the simple or single form, the burden of achromatising the two outside positive lenses being thrown upon the central one of flint, in accordance with the suggestion of Mr. Shadbolt made

eight years previously. Both of these patents were allowed to lapse before coming to maturity.

Soon after the historical events narrated, the Steinheil and rapid rectilinear lenses were introduced, and the triple lenses being supplanted fell into desuetude.

But now this oft-introduced and much-modified triple lens enters upon an entirely new phase of existence. Its possibilities have recently been investigated by an optician whose great mathematical and optical qualifications are universally admitted—Mr. H. Dennis Taylor, the optical manager of the works of the eminent firm of T. Cooke & Sons, York. At the last meeting of the Royal Photographic Society, Mr. Dennis Taylor read a paper on a new lens he had constructed, which possesses properties differing from any lens of a similar nature hitherto introduced. It covered a plate sharp to the edge, with full aperture (=*f*-8); it was anastigmatic, the marginal definition being equal to that of the centre; it gave no flare spot, a bugbear with most, if not (occasionally) all, the previously existing triple lenses, and was free from distortion. The possession of all these properties was amply borne out by several specimens of its work exhibited by the lantern and demonstrated by the negatives themselves.

In the construction of the lens Mr. Dennis Taylor has not sought any assistance from the recently introduced Jena glass, but has confined himself to optical glass made in this country; it is therefore an English lens from Alpha to Omega. Previous to giving a "phrenological" description of the lens—and at present we confine ourselves to only one of a series, that exhibited at the meeting in question—we may state that, while it is a triple compound, it is quite different from any other triple that has preceded it.

Both front and back lenses are single and positive. They are made of a borosilicate crown glass; the refractive index for the D ray = 1·5101. The front and back differ in radii of curvature to a considerable extent, but we may say that both partake of the "crossed" character, the front one much more nearly approaching equal curvatures than the other, being as ·2158 to ·4655, while the curves of the back lens are 1·265 and ·5843, the more curved sides in both cases being to the outside.

Between these two lenses, and placed in near proximity to the front lens, is a double concave lens, formed of two different kinds of glass. Its form when dissected—for the two are cemented—is a double concave of silicate glass, having a refractive index for the D ray of 1·5365, and minus curvatures of ·3472 and ·1150, the shallower being to the front; and cemented to the deeper curvature is a dense baryta crown glass meniscus, with a convex surface of similar radius to that with which it is to be cemented, its exposed surface = – ·1910. It only remains to add that the refractive index of this dense glass meniscus is 1·6110.

From the foregoing it will be seen that Mr. Dennis Taylor has made a decided departure from anything that has hitherto been done in the direction of triple lenses.

REGULATING THE TEMPERATURE OF DEVELOPING SOLUTIONS.

The necessity, especially at this time of year, for the adoption of some means of raising or equalising the temperature of the developing solution, and keeping it at a fixed or normal point, has frequently been urged in these columns, and need not now be further enlarged upon, though the various means of attaining the end may be shortly discussed.

Of course it is possible that there are laboratories or dark rooms in which the arrangements are so perfect as to leave no room for any difficulty in cold weather, but these are not only rare, but very few and far between. The generality of dark rooms—we speak now chiefly of those of the professional, which alone are regularly used throughout the winter months—are in the last degree deficient in all that goes to provide comfort either in summer or winter, lacking ventilation in the one and totally devoid of warming arrangements in the other. Even should provision exist for warming either by stove or hot-water pipes, the place most probably becomes unbearably stuffy long before the solutions on the shelves have reached the normal point; and, if, as is generally the case, the fires be allowed to die out during the long, dark nights, the temperature will always be in a state of fluctuation, perfectly cold in the morning and gradually rising towards afternoon. This is in itself quite sufficient to introduce serious inconvenience from want of uniformity in development, as the temperature, and consequently the action, must vary more or less from hour to hour.

But, even in the presence of the most perfect warming and ventilating arrangements for general purposes, it is still extremely difficult to extend their sphere of utility to the stock solutions and developers, standing on the shelves or elsewhere, in such a manner as to preserve even a semblance of equality of temperature. For this purpose indeed it is almost, if not absolutely, necessary to adopt separate and independent means, though fortunately the trouble involved is far less than is required in the arrangement of the general heating. In its simplest form, a large vessel of water under which a minute jet of gas or a small spirit lamp is kept constantly burning may form a reservoir for tepid or temperate water, and be at the same time used for keeping the bottles of solution at the normal point. With a considerable volume of water, and by carefully adjusting the amount of heat applied and the distance of the jet or lamp from the reservoir, it is not at all difficult to preserve an almost uniform temperature within a degree or two for an indefinite period, the only precaution being to see that the lamp or other source of heat does not fail.

But the perfection of this kind of regulation of temperature consists in the adoption of some means of performing the task automatically and without the necessity for any constant supervision. Fortunately this is possible with scarcely any more trouble than the system mentioned in the last paragraph, and only requires the outlay of a few shillings at the outset in providing the necessary regulator or thermostat. This may be used in conjunction either with a vessel or tank of water as already described, or with a small cupboard or oven in which the bottles are stored, the tank system perhaps affording, of the two, the steadier and more equable temperature, although the principle is the same in both cases.

Some years back, in our volume for 1886, page 110, a number of useful regulators were described and illustrated, and it may be of interest to some of our readers if we again describe one or two of these. Those to be first mentioned are for use with gas, the most convenient as well as most generally employed source of heat and light in small laboratories. In these the fluctuations of temperature act directly upon the gas supply, and, by either increasing or diminishing it as required, preserve a practically uniform level. Where gas is not available, different means have to be adopted, though the principle is the same, the varying temperature causing certain levers to act upon the regulator of the lamp, and so keep it at the normal level.

One of the most convenient instruments for general purposes is Reichert's. It consists essentially of a glass tube, terminating in a thermometer bulb of rather large dimensions, the upper portion of the tube widening out, and being ground to receive a stopper. The latter is in the form of a T, and is hollow, and it is through this stopper that the gas passes into the regulator. It is of such a length that, when inserted in the regulator tube, the point of the stopper reaches nearly down to the bottom of the chamber, and within a very short distance of the top of the column of mercury. The action of the instrument is extremely simple; it is connected with the gas supply by means of a flexible rubber tube, the gas passing through the stopper into the chamber formed by the upper portion of the tube, and out again by a side tube set into that chamber and connected directly with the jet. Starting cold, and with the stopper clear of the mercury, the gas passes freely through the instrument; but, as the temperature rises, and with it the column of mercury, the orifice in the stopper is closed, and the flow of gas arrested. Under ordinary circumstances the light would, of course, go out; but there is provided a bypass, consisting of a minute orifice in the side of the stopper, which permits just sufficient gas to pass to keep the jet alight.

This instrument can be set to any desired temperature in a very simple manner by merely adjusting the quantity of mercury it contains. For the finer adjustment there is a regulating screw working in an arm set at right angles with the main tube and a little below the surface of the column of mercury; by turning this screw, the mercury is forced up in the tube, or let down, as the case may be, and its height adjusted with the greatest nicety to any temperature that may be desired, and, once adjusted, except from accident, it remains perfectly accurate for an indefinite period. The delicacy and sensitiveness of this instrument are so great that, some years ago, in a somewhat severe trial, we found the temperature of a vessel of water, controlled by the Reichert thermostat, varied less than half a degree Fahrenheit in a period of three weeks, and Dr. Reichert himself claims for it an even greater degree of accuracy. It only remains to be said that the instrument is obtainable at most dealers' in philosophical instruments, and costs only five shillings.

Another instrument, similar in principle, but which can be constructed by any one conversant with simple methods of glass-blowing or joining, consists of a glass tube of the shape of an ordinary tuning fork. The two ends forming the elongated U are passed through a cork well saturated with paraffin wax, and this is fitted into a test tube of suitable size. Mercury is passed into the test tube until, at the temperature desired, it just reaches to the joint or bend of the U of the inner tube and closes it. In this instrument the air contained in the test tube acts as an expansive cushion and presses on the surface of the mercury, forcing it up the narrow inner tube, and so stopping the flow of gas round the U. This, like the other instrument, is extremely sensitive, and, when once adjusted and the joints made secure, will last a long time.

Where gas is not available, other means have to be adopted, and here we may take one or two ideas from the construction of artificial incubators. The best form of regulator for use with a paraffin or other lamp takes the form of a bent glass tube, containing mercury, fixed in a frame of wood or metal, and balanced after the manner of the beam of a scale. By the alterations in temperature the column of mercury varies, and so upsets the equilibrium of the arrangement, and by the action of a series of simple levers the regulator of the lamp is raised or lowered in accordance with the changes of temperature. This, like the other instrument, is easily adjustable to any temperature.

A very handy regulator for special purposes is the capsule arrangement used in some of the artificial incubators, though it suffers from the disadvantage of being unadjustable except by the use of weights and other devices that are not to be relied upon for accuracy. They consist of a capsule of very thin metal, containing in its interior a minute quantity of some volatile liquid, the expansion of which at a certain temperature acts as the power which, through a series of levers, as in the previous case, raises or lowers the flame.

THE TREATMENT OF NEGATIVES.

The peculiarities of the new printing processes which have made such growth of late will have a decided tendency to encourage unsafe modes of dealing with negatives, so much so, that we have deemed it wise to utter a timely word of caution.

In a country like ours, with such ever-varying climatic conditions, it is quite evident that, and unless some thought be given to the matter, injury is over-likely to accrue, even though the negative be not in use. For example, let us take such conditions as we have lately been experiencing. We have, say, had a dozen negatives stood upon a shelf nearly touching one another. If they be not varnished, they would, at intervals of time, be coated with moisture from the air, unless kept in an artificially warmed room. It would not be impossible for enough moisture to collect on the surface to run down the plate and collect in a small pool, though this would be an extreme case. Very little pressure accidentally applied would cause the plates to touch, and, if this happened in their damp state, they would be in danger of being utterly spoiled through cohering in the tenacious manner characteristic of wet-gelatine plates generally. If they were varnished, this particular risk would be greatly diminished, for moisture from the air is far less readily precipitated upon varnished than vitreous and other surfaces, and they have no tendency to absorb moisture in damp air.

Such dangers as these of the mechanical kind do not touch the question of these new papers. They have so little free silver upon the surface compared with sensitised albumenised paper, that they may be used with impunity in weather so damp as to render the latter very dangerous. Most amateurs and beginners like to experiment with many kinds, and it is easy to imagine one with a few months' experience of printing-out paper desiring to give albumenised paper a turn. If he use unvarnished negatives during open, damp weather, he may safely rely upon finding upon his choicest subjects, say, when put into use again after winter storage, an irregular series of brown stains of an utterly irremediable character, caused by a minute portion of the free silver of the albumenised paper adhering to the damp plate, and, as it gradually decomposed, becoming deeper and deeper, till it was almost actinically opaque. We would here repeat and emphasise the warning that we have before given, that, if many prints are likely to be wanted from a plate, it is most unwise to take a single print, except under very favourable conditions, until the negative has received a coat of varnish. Those of our readers who have practised with printing-out paper only

will scarcely believe in the universality of our recommendation, but we would only say to them, Try a few experiments with albumenised, and wait the result for a few months. It may be objected that varnishing prevents any further chemical treatment being applied to the plate; but nothing is simpler than to remove the varnish, if by any chance it be desired to intensify, or to reduce, the negative. Methylated spirit, better when slightly heated than when cool, is used till all the varnish appears removed. A second application (of course in a suitable tray) is next made, and, finally, a third bath of spirit, to which five per cent. ammonia solution has been added. The plate may then be washed under the tap without any danger of producing an opalescence of varnish on its surface, as might happen if the ammonia were omitted and any further treatment given to it. It is very little trouble and very little cost; a thin solution of orange shellac in methylated spirit is all that is necessary, and it is very cheap and easily made. We again advise every one who values his negatives to varnish every one of them.

The negatives of a score of years ago were generally stored in open racks, or in grooved boxes, the former being preferred on account of the free ventilation preventing moisture deposition; but we do not advise this mode for present-day negatives, at any rate for portrait work, for the amount of retouching that is given to all such negatives is so great that it cannot be properly cleaned from that film of dirt that is inevitably deposited from the atmosphere, even in the cleanest of apartments, upon all bright surfaces exposed to the air. The requisite friction would remove the results of the work of a day or more in retouching. Hence all such negatives should be stored away in closed boxes, so as to preserve the surface to the utmost. If we were asked to summarise the requisite precautions to be taken for the suitable treatment of negatives, we should say: a varnished surface, kept always clean when in use, and a closed box for storage when the negative is "on the shelf."

Photography and the Czar's Funeral.—The obsequies of the late Czar have furnished much food, of an interesting nature in its way, for the camera, and Russian photographers, as far as they could, have availed themselves of it. But there is weather in Russia, as well as elsewhere, which is a factor in connexion with photographing outdoor scenes. A telegram from St. Petersburg, on Wednesday last week, says: "The photographers who came to the capital for the funeral pageant, to the number of 150, were baffled by the dull weather yesterday, and utterly defeated to-day, in their attempts to take views of the decorations, which wear a bedraggled and woe-begone aspect." The weather, however, is doubtless, as a rule, better in St. Petersburg than it is in London, for we doubt very much if 150 photographers would attempt to photograph a pageant of this description in London in the middle of November, interesting though it be.

Photogravures.—As a rule, art critics do not take kindly to photogravures, and some lose no opportunity of having a sneer at them. Unfortunately, however, there is too often good ground for it; but frequently most excellent work has been condemned for no other reason than that it is photogravure. It is therefore a little refreshing to see that at times it is even tolerated. In a notice of "some new prints," this is what the *Standard* said a few days back "The ordinary photogravure is not often worthy of notice, but here and there there is an exception, and that photogravure which is published by Mr. Maclean, of the Haymarket, of Albert Moore's delightful and ideal vision of *A Summer Night*, is certainly above the common." In concluding, the critic adds: "*A Summer Night* is a conspicuous success. Still, it is a photogravure, and, as such, necessarily imperfect." If that be correct, it is certainly not comforting to those who are now, as amateurs, enthusiastically experimenting in that direction.

A Novel Law Case.—A suit of some interest to those publications that offer prizes, and those who compete for them, was, according to a contemporary, recently decided in the City of London Court. It was this. The plaintiff, a Mr. Morris, sued the proprietors of *Science Siftings* for six guineas, the value put by them on a chain. The chain was offered as a prize in a competition for a process of transferring pictures, and was won by the plaintiff. On his behalf it was alleged that the chain, instead of being of the value stated, was only worth two pounds. For the defence it was contended that the wholesale price of the chain was 3*l.* 12*s.*, and that a reasonable retail price for it would be 6*l.* In the end, the jury found that the chain was worth 2*l.*, and awarded the plaintiff 4*l.* 6*s.* damages, and for that amount judgment was entered with costs. Prize-winners in competitions are often dissatisfied with what they have gained, it not being nearly of the value purported; but it is not all who know that they have a remedy in a court of law. Those who offer the prizes should also bear this fact in mind.

Art at the East-end.—The Annual Exhibition of pictures at the People's Palace is, as usual, attracting large numbers of visitors. Nearly three hundred works are on view, many of them loaned by high personages, H.R.H. the Prince of Wales being amongst the number. Old and modern masters are well represented in every phase of art, though landscapes are fewer this year than in some previous ones. On the other hand, portraits of well-known men, by our leading modern artists, are more numerous than usual. Amongst the painters represented may be mentioned Vandyck, Holbein, Rubens, Sir Joshua Reynolds, Wouvermans, George Morland, Sir F. Leighton, Goodall, Watts, Herkomer, Millais, and many others. Not the least interesting part of the Exhibition is a series of water-colour pictures from South Kensington, showing the progress of the art during the present and past century. The show is well worth a journey from any part of the metropolis to see. Many East End portraitists, to judge from their specimen frames, would do well to study some of the pictures now on view in their neighbourhood.

A New Invention.—When the lay press touches upon photographic matters, we often hear of strange things. Here is what an evening contemporary says: "The latest development in the art of photography is a contrivance for taking negatives of quickly moving objects, such as birds on the wing, a bullet in motion, or a train at full speed." "The depiction of such phenomena requires so brief an exposure, that the quickest mechanical shutter is useless, and it can only be effected by employing an electric spark. Professor Worthington, the inventor, conducted a long series of experiments before he discovered a spark powerful enough to answer his purpose. He recently found, however, that a spark produced by the discharge of two oppositely charged Leyden jars, which did not exceed one-hundred-thousandth part of a second, gave a sharp and distinct picture." It would be interesting to know how the spark from Leyden jars was made to illuminate a railway train in motion, or a bird in flight, also what plate would reproduce them in the one-hundred-thousandth of a second, and what would be its speed measured, say, by the Hurter & Driffield system.

Copyright in Portraits.—One of the most frequent questions relating to copyright that we have to answer is, as to whether a photographer can copyright a portrait taken in the ordinary course of business and paid for? Since the case of Pollard *versus* the Photographic Company was decided, there has been no doubt that a photographer, who takes a portrait for which he is paid, has no right to use it for his own purposes. In another column will be found a report of a case tried one day last week in the Queen's Bench, which

vill be read with interest by those who make a speciality in taking portraits of celebrities. The plaintiff, Mr. Ellis, brought an action against the *Ludgate Monthly* for infringement of copyright. Certain portraits of actors were taken at the plaintiff's solicitation, and a certain number of copies were given them. According to the defence, at the time of sitting, other portraits in private clothes were taken, and, when the proofs of these were submitted, copies were ordered and paid for, and it was these that were said to be used by the defendants. The Judge decided that this was the fact, and he held that the portraits had been taken on behalf of the sitters for "valuable consideration," and that the defendants were entitled to judgment, with costs. This case suggests some interesting points. Suppose the sitters, when they saw proofs of the portraits in character, had ordered further copies and paid for them, would that be considered a "valuable consideration?" or, when they saw the proofs in private dress, and no copies had been ordered, in whom would the copyright be vested, or could there be any copyright in such a case? Verily, our Copyright Act wants to be made more explicit than it is in face of some of the decisions that have been given.

JOTTINGS.

My wife, with the erratic impulsiveness of her sex, has lately taken a new and original departure. She reads the photographic papers! Nevertheless, despite the large draft upon her patience and non-somnolent inclinations which such a weird combination of literary eccentricity and heroism necessarily entails, "she still lives—a prosperous gentlewoman." The gravity with which she peruses these pages, in particular, convinces me that she highly reveres the erudition and profundity of intellect retailed every week for the altogether inadequate sum of twopence. Up till last Friday morning, however, she had not favoured me with any information as to the effects her reading had had upon her, but on the occasion referred to, while we were seated at breakfast, she suddenly dropped the newly arrived copy of the JOURNAL, and up and spoke indignantly as follows: "Cosmos, be good enough, when you are writing your next 'Jottings,' to give my compliments to the members of the Photographic Club, and say that, in excluding ladies from their lantern meetings (as I see they have done), they are guilty of most unchivalrous behaviour. I'm sorry to see them following the unmanly and selfish precedent created by the London and Provincial Photographic Association. It's a shame! I want to know *why* the Photographic Club thinks we women are unfit to have the wonderful privilege of being present at their meetings? I hope *you* don't belong to that Club, Cosmos? If it's unfit to be honoured by the presence of *ladies*, it's no place for *gentlemen*, so there! The idea!" My dear Photographic Clubbers, I spare you the remainder of the remarks made by my excellent spouse. In delivering her message, I beg to say that I quite agree with the sentiment of it. The exclusion of ladies from scientific and social meetings nowadays is worse than a crime: it is an anachronistic blunder.

Some of the papers that have been read before the societies during the last few weeks appear to me to have been of more than usual interest. The Salon Conferences especially gave occasion for two or three discussions of a distinctly profitable character. Of these, that started by the Rev. F. C. Lambert, on *How to look at Pictures*, came at a peculiarly appropriate moment. While I listened to Mr. Lambert's observations, I could not help being struck by their clearness, good sense, and transparency, qualities which are not always characteristic of the utterances of those who talk about art. With his analysis of the methods to be adopted in picture-viewing I find myself in general agreement. I have, however, one reservation in reference to his definition of picture-making. In his opinion, "if a man hit the mark he went for, he had secured the first step towards success." If this means success in the artist's own estimation, well and good; if, on the other hand, his "success" is dependent on what other people think of his efforts, why, then, I would rather put it, that if *he succeeds in making himself understood* he has done more to deserve success than if he merely hit the mark—accidentally or otherwise. The Salon Exhibition is itself a record of failures on the part of many photographers to make themselves understood.

The Doctor, by Mr. Fildes, which in a surprisingly short time has attained the great and enviable popularity of the print-shop window, came in for some rough handling in the course of the discussion that followed Mr. Lambert's discourse. Mr. Lambert called this picture a work of art, and was denounced for so doing. Mr. Davison mercilessly characterised it as "Daily Telegraphese" and "screaming." He might also have labelled it "gush," or "Adelphi melodrama," without any more success in sustaining the queer doctrine that gush, or sentiment, or pathos, call it what you will, has no claim to artistic representation. Unlike the French, neither as a nation nor as individuals, do we "scream"—in public. We English are such hypocrites. Privately, however, and away from the mocking eyes of our daily acquaintances, I fear that, after all, most of us indulge in a little sneaking sentimentality towards our mothers, our wives, our sweethearts, our sick children, and so forth, although in public we stigmatise this kind of thing as "Telegraphese" and "screaming." *The Doctor* tears aside the curtain from a little piece of domestic pathos, such as is probably finding its counterpart in thousands of homes, high and low, at this moment; and it is because the artist shows us what we phlegmatic men don't care to talk about to each other; it is because *The Doctor* is true to life and nature; it is because, as I said in the previous paragraph, the artist has made himself understood, that he has achieved a success which elicits the applause of the many and is unaffected by the sneers of the few. I wish I were sure that sundry photographic productions, which their authors have the temerity to consider works of art, had as many claims to be so ranked as *The Doctor* can afford to do without and still pass muster.

I notice that, between the 20th and the 29th of the present month, six photographic Exhibitions, having open classes, are to be held in London alone! Six Exhibitions in nine days! Surely this overlapping and clashing must not only be detrimental to the interests of the societies themselves, but also, as regards the open classes, constitute a great drain on the resources of exhibitors, and thus tend to lower the average quality of the pictures shown. Again, where actual clashing does not occur, will not the open classes, on account of the new system of passing on pictures from one Exhibition to another, present a by no means desirable similarity of appearance? I'm afraid that exhibitors in the apparatus sections look upon these minor Exhibitions with no friendly eyes, inasmuch as I believe, from what I hear from many of them, that they regard the outlay for space and attendants simply as an unprofitable tax which they would gladly avoid. Beyond ministering to the vulgar appetite of the sordid medal-hunter, and affording opportunities for a little self-glorification in other directions, I cannot for the life of me make out what useful purpose several of these Exhibitions serve. At any rate, if we *must* have them, would it not be wiser in future to avoid this stupid treading of each other's heels off? Why should not the various secretaries early next year have a meeting to arrange dates that shall not come so absurdly near one another, and thus at least remove one of the many objections to these Exhibitions being held at all?

From Exhibitions to the Judges thereat is an almost inevitable step just now, with the remarkable paper on *Elastic Exhibition Rules* of Mr. Welford in one's mind. As this paper concerns itself with the alleged violation of certain rules agreed on by a Conference of Photographic Exhibition Judges for their own guidance, it seems to me that Mr. Welford's criticisms should have been brought before the gentlemen more intimately concerned in the matter—that is, the Judges themselves—and not before the general photographic public, which probably does not care a fraction of a tinker's anathema for the whole business in dispute. This to me, as a non-exhibiting outsider, looks absurdly trifling, and might, in my humble judgment, have been amicably settled by the Judges themselves in five minutes. Mr. Welford has himself been a Judge on many occasions, and his public criticism of the mistakes or faults of his fellow-Judges may

be courageous and tend ultimately to do good (which I doubt), but it is neither judicial nor dignified. The whole paper is a grievous error, in that it rests on no intelligible *raison-d'être* so far as the outside public is concerned, unless (a strong improbability, I take it) Mr. Welford's fellow-signatories can be proved to have been guilty of wilful bad faith in the administration of the rules. As for the penultimate paragraph, in which (being a "journalistic Judge" himself) he subjects his fellow journalistic Judges to a series of charges of self-seeking, I have only to say that, as I understand the etiquette of the matter, Mr. Welford owes those gentlemen an apology, as unreserved and as emphatic as his innuendoes have been unpleasant and his *esprit de corps* and loyalty so poor.

I was glad to see that, in the course of his able and comprehensive address to the Royal Photographic Society, Sir Henry Trueman Wood incidentally gave Mr. Bolas credit for having fourteen or fifteen years ago indicated practically the use that could be made of a photographic camera held in the hand, and thus, as it were, laid the foundation of hand-camera photography, the utility of which is occasionally lost sight of in presence of the vast amount of button-pressing that goes on. Mr. Bolas's practical suggestion will, no doubt, take rank as of great historical interest some day, and I hope, therefore, it will not be lost sight of in the meanwhile, to which end I give it mention here. By the way, it is not generally known that so far back as 1882 a magazine hand camera, with sheaths, was in existence and in use; nay, more, that after all these years it, or rather its form, still survives and enjoys great popularity.

Attempts are being made this winter to popularise the electric light for portraiture among photographers, and success to some extent is attending those attempts. On dark, short days there is no doubt of its proving a comparatively cheap boon, which photographers would do well to avail themselves of if they wished to be abreast of the times. But I cannot here resist the opportunity of confronting the much-quoted remark that the results are in every sense comparable to daylight portraits. I do not hesitate to say that this is an exaggeration. There is a natural roundness, softness, and evenness about the lighting of a good daylight portrait which no amount of skill or cleverness can impart to one obtained by the electric light, arc or incandescent. I speak not only from the results of a large series of personal observations and experiences, but from those of others. The electric light at best, so far as the effects are concerned, can only be a more or less efficient auxiliary to daylight. As to its being a perfect substitute, the idea is absurd. All else being equal, I know which kind of portrait I would the more willingly pay for, and my ideas on this point are, I believe, only the reflection of what the paying public thinks. There is an uncanny glitter about the eyes of an artificially lighted portrait which is unpleasantly obvious. "Artificial lighting for portraiture" is a good catch cry, it is true; but, after all, it is easily overdone. The average man or woman (particularly woman) usually selects tolerably fine bright weather in which to be photographed, and, as daylight is cheap, its supersession by electricity, or any other artificial illuminant, will never be more than partial, or such as is dictated by necessity.

There is an ominous line at the beginning of the report of the Royal Photographic Society's meeting published last week. Fifty-six candidates for membership were balloted for, and one of them was not elected. I don't know who the unsuccessful gentleman was, and consequently cannot say whether he was rightly or wrongly "pilled," but the moral of the occurrence is a useful one. It is, That the members of the Royal Society are disposed to exercise some little discrimination as to who they admit to the privilege of membership. The unsuccessful candidate has the satisfaction of knowing, therefore, that his rejection has at least elicited this interesting fact.

COSMOS.

A PHOTOGRAPHIC WEDDING.

[Polytechnic Photographic Institution.]

THE title of my lecture is one which may suggest to your minds the subject of a popular novel, and you may be anticipating, in accordance with the spirit of the day, that some social problem or some fresh outbreak on the part of the New Woman is to be dealt with. It is true that, like the the novelist, I have to deal with a problem, but my problem will be entirely connected with the laboratories of the photographic operator and the process worker, and my characters are the chief sensitive agents employed by these respective workers—they are none other, in fact, than our old friends, Silver Bromide (a gentleman of a highly sensitive nature) and Bichromate of Potash (an equally valuable, though less sensitive, agent, who will appear in the character of the lady).

Now, hitherto, these two friends of ours have retained their separate individuality, and, although (like the two metals of a railway line) in continual companionship, they have never united. It is my intention to-night to show a means by which the future evolution of photography may lead to the closest union between them, and it is this which will constitute a "photographic marriage."

The method I shall put before you is an entirely novel one, and hitherto has not been introduced to the public, except by brief notices in the chief English and German technical journals.

Let us first glance for a moment at the birth, childhood, and development of bichromate of potash as a sensitive agent. We find the initial record of the action of light upon this substance was made by Mungo Ponton in 1838, but it was not until 1854 that Poitevin (a Frenchman), and Fox Talbot (our countryman) first called attention, by their experiments, to the valuable possibilities inherent in the use of bichromate salts.

From this time onwards a large number of investigators have extended its practical application, amongst whom I may mention, as pre-eminent, Joseph Swan and Walter Woodbury.

At the present moment these applications form by far the largest and most important uses of photography in the arts, including as they do photogravure, photo-lithography, photo-typography, collotype, and allied processes.

Now, the question naturally arises, Let us now ask ourselves what special function is exercised by the bichromate of potash in these valuable processes?

To answer this question we will take a concrete example. Suppose we intend publishing a photogravure reproduction of to-morrow's Lord Mayor's Show. What have we to do? We must provide the printer with a metal plate etched so that its surface holds ink, varying in quantity with the tones of the original. To etch the plate satisfactorily we cover it with an insoluble gelatine film, whose thickness varies in accordance with the tones of the original. Now, the only photographicable difference between the tones of the original is a difference in the intensities of light reflected, and, as the insoluble gelatine has to vary in thickness in accordance with these differences in light intensities, we must necessarily obtain it by the same agency, *i.e.*, by the action of light. And here it is that bichromate of potash comes to our aid, for it enables us to convert these optical differences into substantial mechanical differences in the thickness of our films. On this diagram we have the explanation set forth. We have bichromate of potash and soluble gelatine as our sensitive film; on insolation, *i.e.*, exposure to light, the bichromate is decomposed, and amongst other substances set free is a chromium oxide. This chromium oxide, as fast as it is released, combines with the soluble gelatine, forming a new compound, which is insoluble. If the whole surface of the film is equally exposed to light, it becomes insoluble over the whole surface, and, if the exposure is prolonged, the effect gradually penetrates right through the film, until at last its entire thickness will become insoluble; but, supposing parts of the surface of the film are masked or sheltered from the light to varying degrees, then the intensity of light falling upon the different parts of the film varies in a similar manner, and the film is rendered insoluble through proportional degrees of thickness.

Now let me call your attention to what we have done. We have, with the aid of this valuable reaction, converted various intensities of light into various insoluble thicknesses (of our gelatine film), and it is this reaction which forms the whole basis of the application of bichromate of potash in photography.

Having now a clear notion, I hope, of the function of bichromate of potash, let us return to the wedding, which some of you will perhaps think has been indefinitely postponed.

In our proposed photogravure of the Lord Mayor's Show, the procession will have to be photographed instantaneously, because, as you know, Lord Mayor's Shows are like "time and tide"—they wait for no man, not even a photographer; and we now come to recognise one of the shortcomings of our friend, Bichromate of Potash—with all her excellencies, we must admit she is somewhat lacking in sensitiveness. She is quite at home, it is true, when used in conjunction with a negative or transparency; but, if we were to employ her in the camera, she would keep the show waiting about a week. This would not do at all, therefore we have to seek the aid of our highly sensitive friend, Silver Bromide, and here we see the necessity of employing two distinct processes for the production of our etched plate. For the Lord Mayor's Show, and, indeed,

or the majority of subjects, we have, in the first place, to use a highly ensitive film; we therefore employ silver bromide, which gives us a egative, and from that we get a transparency; and, finally, with the id of the transparency and a more prolonged exposure, with our less-ensitive friend, the Bichromate Salt, we obtain the insoluble film for tching.

Now, it is obvious that, if our bichromate film could be made as sensi-ive as our silver bromide film, we should have no need to employ the atter at all, and a whole series of operations could be dispensed with; on the other hand, if our silver bromide gave us an insoluble film, we ;ould altogether dispense with the bichromate process; and this brings ne to the proposed wedding.

Suppose I take a silver bromide film exposed, and develop it with ferrous oxalate. You are aware that in the developed image we have the various tones of the original represented by particles of silver, and you are also aware that nowadays the modern vehicle which holds the silver image is gelatine, the same substance employed in our bichromate films. If the film is placed in hot water, the gelatine (being in its ordinary condition) dissolves, and the image is destroyed; but, if it is first immersed in a solution of bichromate of potash, exactly the same effect is produced which is brought about by exposing the bichromate and gelatine to light, *i.e.*, the bichromate is decomposed, chromium oxide is set free, which instantly combines with the gelatine, and renders it insoluble. As you will see represented on the second diagram, the agent which reduces the bichromate in the new process is the reduced silver. It does not matter whether the silver image is obtained by development or by printing out, the effect is the same.

Well, what is the result we have arrived at? We have, as our present mode of working, two processes. We have also, as I have endeavoured to show, a means by which the two processes may be united. In other words, the reducing power of nascent silver upon bichromate of potash may take the place of the reducing action of light. This being so, a single exposure, and that of the briefest duration, gives us, immediately after development, our insoluble film for etching, and, as well as economising both time and labour, we, at the same time, secure a more perfect representation by avoiding numerous intermediate operations.

In the limited time at my disposal, I am only able to lay before you a statement and explanation of the reaction; on another occasion I hope to show you the results of its practical application. Meanwhile, I leave the subject for your consideration, feeling sure that there is in the reaction an immense field for simplifying and extending the methods of photo-engraving and allied processes. E. Howard Farmer.

MOUNTING AND FRAMING.*

As regards glazing, this, although generally necessary, as a rule, injures the picture, reducing the darker portion and generally levelling the white. It has quite a different effect from that attained by varnishing or treating with megilp or gums; it is possible, however, to produce certain quaint and pleasing effects by judicious choice of glass, showing certain faintly suggested tints and other imperfections. Even the best picture glass has more or less colour in it, and occasionally something is to be obtained by glazing with two glasses. This is, however, an experiment easily tried, whilst the selection of bad glass with air bubbles, &c., may sometimes add a quaintness to the general idea, but is, I fancy, to be deprecated as affectation. Of mounts, the ordinary plain flat mounting board, tinted or white, is perhaps the simplest of mounts as well as the cheapest. Any large card and paper-dealer will cut them the exact size you require of the best card, and they will, I think, be found of better material than the cheap prepared mount; the mount I have here is such a one, suitable for a quarter-plate, but, being white, it is too strong and bare for most prints, the bareness and glare of the white being so pronounced as to attract the eye to itself instead of keeping the attention centered upon the photograph. This bareness may ofttimes be softened down by judiciously running a pencil line or two round; if more than one, care must be taken to distribute them pleasantly, and not to make them in any way conspicuous by regularity or otherwise. I suggest lead pencil by reason of its capacity for giving a quiet and inconspicuous effect. Of course the lines *must* mitre round the picture, any crossing of corner ornaments, as in the Oxford mounts, being absolutely intolerable.

The plate-sunk mount so commonly used, although a sham, probably owes its extensive use to the quietness and delicacy of the lines round the sinking, and the variety of surface caused by the sinking and mounting on of the quiet tints, the whole never being so aggressively vulgar as many of the mounts heretofore manufactured for photographers. It is, as I observed, a sham; but, nevertheless, perhaps the least objectionable form of ready-made mount we have.

It has, of course, been said that the sinking line is improper, inasmuch as it is intended to deceive, and if it is used with any such motive it would, of course, be contemptible, and, I take it, quite at variance with the basic principles of art; but, for my own part, I do not see any reason to attribute improper motives to its use, for surely no one ever is, or can be, deceived by it, and I look upon its use rather as an indication of the poverty in ideas of the photographer that he introduces into his productions that which has no meaning in his art.

Of the plate-sunk mounts, perhaps the most pleasant I have seen were formed by simply mounting a photograph upon a tolerably large sheet of Whatman's drawing-paper, and plate-sinking afterwards in the press. This, no doubt, tended to give the photograph something of the air of an engraving, and consequently may be said to have gone from bad to worse; but still, as mounts go, the particular photographs I refer to looked extremely well. I may mention, they were all mounted out of the centre of the paper, still following the fashion of many etchings and engravings, and with tolerably good effect. The point, however, with which I was most struck was the thinness of the mount, and the small space a number of prints occupied in a folio. You see that, although mounted on comparatively thin paper, the press had taken out all buckle and left the paper and print quite flat.

If a photograph or drawing is to be framed as well as mounted, then the mount may with advantage partake more of the nature of a portion of the frame, and a cut-out mount may be used. This, of course, is coming just one step nearer close framing, and is perhaps unsuitable for some prints, such as very light or vignetted pictures.

Supposing a print to be vignetted, the plain border which is to isolate the print is most naturally that sheet of paper or support upon which the print is formed, and into which it dies imperceptibly at all its margins. Failing this, the nearest approach to it is desirable. A cut-out mount, of course, has the very opposite effect, and therefore is unsuitable.

In using cut-out mounts, simplicity of outline must never be tampered with. No cutting to fancy shapes can be tolerated under any circumstances, and only in very rare cases can the curved lines of the circle and ellipse be used with dignity.

The cut-out mount generally being, as it were, part of the frame, must be treated with that, whether of wood or card. Separate decoration of its own, I think, cannot be considered allowable, although such may be, and constantly is, applied to the frame.

Bearing upon this point, I have often noticed that a prominent figure in an oak gilded mount is more than a strong picture in colour can stand. The frame, on the other hand, is open to any decoration which may be desired, provided always the object of the frame is never lost sight of, and bearing in mind that, if the eye is in the slightest degree led from the picture to the frame or its decoration, it is defeating the object with which it is employed; consequently, up to this point, decoration is in keeping.

In the selection of suitable mounts it is absolutely necessary to consider the pictures individually. It is of no use broadly saying, for instance, that a plate-sunk mount is suitable for a platinotype—doubtless, platinotype prints do, as a rule, look well upon such mounts—but if we wish to get the best out of our prints, whether platinum or otherwise, we must be prepared to consider the various factors which go to make up pleasing results.

Roughly speaking, colour-darkness or lightness, and texture are the three heads under which we may regard mounts (leaving, for the present moment, the matter of preparation). Now, each of these three points is only to be settled satisfactorily by the exercise of good taste; there are, and can be, no rules, and all we can do in discussing the matter is to consider the points where the good taste is best exercised.

If, for instance, we take colour—ours being, so far, monochrome productions. What is the colour of our print? We may take and put the mount into harmony with the print, or we may make a contrast; probably to make a harmony is generally the safer and more pleasing, and if the print is quiet or tender in its colour or feeling a harmony is essential. The stronger or bolder class of effects and large subjects may be brought into comparatively strong contrast.

I show here two mounts. The colour of one is in harmony—that is, one particular colour forms, as it were, a base to the colours of both; in the other case there is a direct contrast. These prints are chosen as being as nearly as possible identical. You can, I think, observe how the red mount sharpens up the picture—defines it, cuts it off too sharply, and apparently makes it smaller, and limits the idea of expansiveness in the plane which we are overlooking; but this happens to be tolerably large in subject, and, were it less bold, the effect would be much accentuated. I show here an example where the same conditions absolutely destroy the effect of a quieter picture. Here the sense of quiet is everything; but, in the presence of a mass of contrasting colour, the tenderness of the whole is lost.

Then, here enters another question, Where and how is the picture to be hung? Is it to hold its own upon an Exhibition wall or to have a large space to itself upon a fancy wall paper? Especially in the latter case the colour must be taken into account; in the former, the print only need be considered, and left to take its chance as regards surroundings.

The general effect of a mass of colour placed in close proximity to a picture is to depreciate the same colour in the print and to accentuate the complementary colour in the picture. For instance, a mass of red next a warm-coloured print will tend to lower the redness of the print and show up any greenish tint which may exist.

From a consideration of the reasons we laid down for the requirement of a mount, it will be seen that, as a rule, any crude or strong or primary colours are to be avoided, excepting in very rare cases.

* Concluded from page 699.

Then, again, as to the darkness or lightness. If a mount is for a dark wall, it should be dark; and, if for a light wall, light. A light mount upon a dark wall resolves itself into a spot, and the lightness of the mount is made lighter still.

In the same way, a light mount directly influences the print. Take, as an example, a white mount on a very black picture. The result is the dark portions appears darker and the light portions appear comparatively dark; with a black mount the reverse is the case. This, of course, is the extreme case, and the influence is very marked, but may very often be turned to good account, especially in a lesser degree. As an example, we have, say, a photograph, the dominant feature of which is a brilliant sky, the lightness and brilliancy of which we wish to emphasise. We must not use a white mount, for this will degrade the high lights of the print; but we make the mount as dark as we conveniently can, taking care not to make it so dark as palpably to depreciate the shadows or dark portions of the landscape.

Beyond the general effect of light and dark, there is another means of using these two by the introduction of small surfaces of either.

I have been speaking about black and white mounts. Now, both these command the necessary isolation for a photograph; but I think that, as a rule, it will be found very few prints will stand either without some directly modifying influences. Line engravings are generally upon white mounts, most often the mount is the actual white paper the engraving is printed upon; but these engravings, as a rule, are far more powerful than photographs, the brilliancy of white and black lines in combination being very great.

The texture or quality of the surface of the mount is principally to be regarded as a power of contrast. If you wish to cause a highly surfaced print to look more glossy than before, contrast it with a very rough mount; if, on the other hand, you wish to emphasise the roughness of the print, surround it with a smooth mount.

Mounts with bright and polished surfaces act in much the same way as gold, and are very bright when caught at the angle of reflection, and proportionately darker when viewed at any other angle. I take it, however, that bright-surfaced mounts are most suitable for very delicate, small, or transparent pictures, intended to be viewed at a near distance. Rough-textured mounts, I think, so long as they are not obtrusively rough, are more interesting and generally pleasanter to the eye.

As regards materials for mounts, these are numberless—woods of all sorts, hard and soft; papers, cards, fabrics, &c., far too numerous even to mention.

Whilst upon this subject I may draw attention to the objectionable methods photographers adopt of writing the name or title upon the mount, usually in blackest ink, in an indifferent hand, immediately under the print. You may see many such at most Exhibitions. Now, if it is necessary to inform every one what the photograph means, it is at least desirable to write the description in some less obtrusive pigment, and in a position in which it should not be markedly observable unless sought for.

In both mounts and frames the proportions are of the utmost importance, and, of course, must be directly suited to the particular object in question. It is most desirable, if you wish to have a picture look its best, that these proportions, together with the colours, should be carefully studied and planned out, and *not* left to the taste, or want of taste, of the framer and guilder. The *only* way in which any idea can be obtained beforehand is to draw the mount and frame upon paper of approximately the required colour. This always gives far greater satisfaction than the hap-hazard selection at a shop from small samples, which look quite different when in mass.

As regards the widths of mounts and frames, each individual case must be treated upon its own merits. For each individual there is a best and worst proportion, and numberless grades of proportion between these two, and, if you wish to obtain the best you are capable of, you must experiment with judgment and taste; it is only by seeing something and feeling its defects that improvement can be obtained and the happiest result hit off.

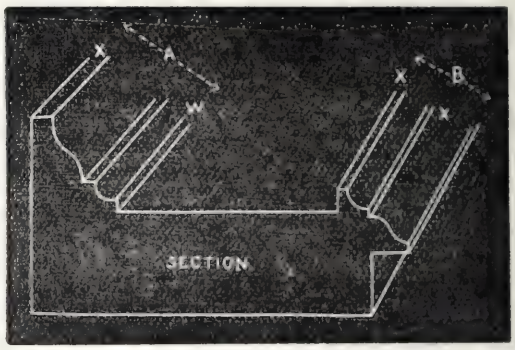
Apart from any other considerations, a proportion of two to three, there or thereabouts, is supposed to be the most pleasing shape for landscape pictures, and is the proportion, perhaps, more often used in drawings than any other. It will be seen that most photographic sizes are already squarer than this, and the wider the mount and frame the squarer the shape becomes. As a rule, shapes where the sides and ends are nearly of the same length are to be avoided. On the other hand a small picture, irrespective of shape, requires a proportionately wider mount and frame, if for no other purpose than to keep it from being dwarfed by proximity to larger work.

In designing mounts, it is always desirable to avoid making the width of the mount equal to the width of the picture, and most mounts will be found to work best from very narrow up to two-thirds of the width; after that, the division becomes too formal, until the mount becomes very considerably wider than the print. But mounts of such very great width generally tend to lessen the apparent size of the picture, besides bordering on affectation. A mount of exactly half the width of the picture suffers likewise from a too formal distribution of parts. Beyond these, it is hardly desirable to formulate rules as to width of mount.

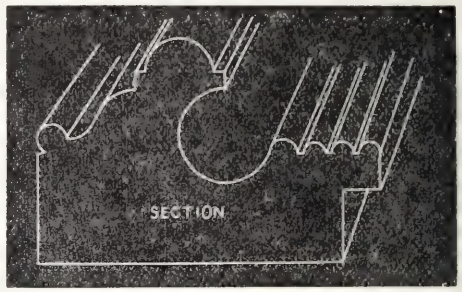
If practicable, I think it best, and least conspicuous, to have the frame and mount equal in width at the sides and top, and it is customary to allow a little more mount at the bottom; but, if the picture to be framed would lose its proportions, it may sometimes be desirable to give a little greater width at ends or as required; this cannot, of course, be done with wooden mounts or close framing. It is, however, I think, a desirable thing not to use mounts of greater width than is necessary. This is a matter of considerable importance in exhibitions of paintings, where, for obvious reasons, wide mounts are not encouraged. Works of large subject or of tolerable size are, as a rule, those which may, with good effect, be framed close; but it is, of course, purely a matter of taste, and requires considerable care to produce good results.

Practically the same conditions apply to frames as to mounts, excepting that it is best to err on the side of too much strength in frames, especially if for exhibition purposes, where they may be hung amongst strange mixtures. In designing or selecting moulded frames, it will generally be found that mouldings having broad and simple faces, set off by finer lines of light and shade at their margins, or at intervals, are far more effective than when the moulding is all over alike, as, for instance,—

In this case, the lines at A and B give requisite relief to the face



between. Should sufficient relief not be given, add bright lines, say gold on oiled walnut ground at XX, or introduce decoration at W. This will accentuate the face of the frame, and be perfectly legitimate. Now, you will observe that in this section the *motif* is a broad face, which shows as a broad band of light. The same result is to be obtained by making this a broad band of shadow, as, for example:—



This section is from the Exhibition at Pall Mall, where the broad undercut hollow is set off by the lines of sharp light and shade adjoining it.

Now, the decoration of frames by enrichment falls under exactly the same laws, although the manufacturer of stock mouldings generally thinks differently, for he endeavours to work in as many mouldings and as much enrichment as can be got into the space at his disposal; but it should always, I think, be our object to do with as little ornament on the frame as will give the effect we require.

I am afraid you will think me rather dogmatic in some of these statements, but I have no wish to be so, and am only endeavouring to point out what are tolerably well-accepted qualities of mouldings generally.

Of course there is no necessity to have moulded frames; a batten stolen from the roof of the fowl-house (according to the recipe of a photographic critic) will, I believe, do just as well in some cases, but do not have the tooth marks those of a circular saw, or the regularity of the roughness becomes unsightly, and, as regards enrichment and its effect, it is the result only which is the criterion of successful application.

In actual vision there is no direct limit to the view, all things fading out into a vignetted ellipse. As this is impossible in pictorial art, the rectangular limitation of the frame becomes at once a necessity, and has from time immemorial been acknowledged as the conventional restriction, and any variation from the rectangular form at once attracts attention to the frame.

In ancient times pictures were wrought directly upon walls and ceilings of buildings, and the frame represents, traditionally speaking, the mouldings round the panels on the wall or ceiling upon which was painted the picture. Now that pictures are portable property, and a species of furni-

ture, the panel moulding has been retained as the conventional limitation of the picture. Therefore, bearing always in mind this order of things, it is obvious that, within reasonable limitations, the greater the freedom and the individual thought expended the better will be the result, always remembering that the greatest essential is simplicity in both mount and frame, or either.

Whilst advocating freedom in mounting and framing, it must be pointed out that, unless the requirements are considered and thought out, freedom is useless, and results only in eccentricity, which, in any shape, is adverse to the principles upon which mounting and framing can be successfully carried out, the ultimate test of good framing and mounting being that the eye examining the picture is unconscious of mount or frame, or other surrounding objects, unless specially directed thereto, and, when the eye is caused to wander between picture and frame, the unity of the whole ceases, and the frame has defeated its object.

J. C. S. Mummery.

DEVELOPMENT.

[Photographic Club.]

It will be remembered that, when I read my paper on *Timing Development*, Mr. Edwards, in criticising it, remarked that he was sure that by using a developer very strong in pyro heavily restrained with bromide and citrate but with plenty of alkali, my experiments would have a different conclusion, as such a developer possesses a power of modifying the gradations which a normal developer has not. I replied that I had not tried such a combination, or investigated fully the action of citrates; and Mr. Edwards referred me to the redeveloping formula issued with his plates.

Since the meeting I have made a large number of experiments, comparing the action of normal pyro soda against a stronger solution with a citrate added, and the action of Mr. Edwards's formula against a normal pyro-ammonia developer.

The procedure was the same as in previous trials, an exposed plate being cut in two, and the halves developed with the developers to be compared. The aim, as before, was to get the same degree of printing density in the high lights of both halves, and then to compare a print taken from both to see whether the lower tones had been modified by either of the developers. Mr. Edwards's formula is:—Pyro, 8 grains; citrate ammonium, 2½ grains; bromide ammonium, 25 grains; ammonia, 15 mimims; water, 1 ounce; but, as the amount of citrate in this is small, I increased it to 8 grains. The developer is exceedingly powerful and energetic.

The results of my trials are as follows:—

1. That the use of citrates, or of Mr. Edwards's formula, has no power to keep back the weakest tones. The ratio of the time of appearance of the different tones in a negative is exactly the same (allowing for errors of observation) whatever developer is used.

2. That the use of citrates, or of Mr. Edwards's formula, has no power to alter the gradation when compared with the result of normal development carried to the same printing opacity in the corresponding higher tones, there being no fogging with either development.

3. That the citrates of Mr. Edwards's formula greatly reduce the multiplying factor. Thus Mr. Edwards's 8-grain developer gives the same result when developed to twice the time of appearance of the image as given by a development of about 4½ times the time of appearance with a normal 2-grain pyro-ammonia developer.

I send the negatives resulting from each trial, each pair with a lantern plate printed from the two halves together.

Experiment 10.—Landscape, Ilford ordinary, exposed for sixteen times normal exposure.

Pyro, 8 grains; bromide, 8 grains; citrate, 8 grains; carbonate of soda, 24 grains; appeared in 10½ minutes, developed 29 minutes; compared with pyro, 1 grain; bromide, 1 grain; carbonate of soda, 6 grains; appeared in 4½ minutes, developed 27 minutes.

Result.—The two halves differ widely in colour and appearance, the 8-grain pyro appearing to give greater brilliancy, but the printing results are identical.

The next experiment is to test whether a strong pyro developer with plenty of citrate and bromide has the power to hold back the lowest tones while building up the deeper ones. Two identical exposures are made with the sensitometer on the Spurge plan, the apertures being numbered by their U.S. values (Royal Photographic Society standard of diaphragm), and ranging from 1 to 1024. The exposure is such that the apertures below 256 have failed to make a developable impression on the plates.

Experiment 11.—Pyro, 8 grains; bromide, 8 grains; citrate, 8 grains; carbonate of soda, 36 grains; appeared in 5 minutes, developed 11 minutes; compared with pyro, 2 grains; bromide, 1 grain; carbonate of soda, 12 grains; appeared in 5 minutes, developed 19 minutes.

Result.—Both plates (as judged by resulting print) are developed to approximately the same printing opacity in the upper tones, and in both the lowest tone just faintly discernible in the negative is 256. Gradation is identical throughout.

Experiment 12.—Edwards's redeveloper (with 8-grain citrate) appeared in 2 minutes, developed 4 minutes; compared with pyro, 2 grains; bromide, 2 grains; ammonia, 2 minims; appeared in 1½ minutes, developed for 6¼ minutes.

Result.—The print is absolutely identical in the two halves.

Experiment 13.—Ilford ordinary plates, eight times normal exposure on landscape. Edwards's redeveloper, as before, appeared in 60 seconds, developed 2 minutes; compared with 2-grain pyro-ammonia as before, appeared in 70 seconds, developed 5¼ minutes.

Result.—The two negatives are absolutely identical in result when printed together.

In both landscape examples I have sent a paper print in addition to the lantern-plate print, to show that the result is the same if tested by another printing process.

Now, let me concede one point in favour of the citrate restrained developers. Up to ten or fifteen times normal exposure I found that, when developing with a normal (bromide restrained) developer, there was no fog; but in some trials, with thirty times and sixty-four times over-exposure, I got fog extending over the protected edge of the plate, although shorter exposures developed in the same dish for a longer time were free from fog. The same thirty and sixty-four times exposures, developed in a citrate-restrained developer, were free from fog. I can only at present record, not explain, this. I need scarcely say that, in all the examples (negative and print) both sides have received identical exposure; there was no faking.

Very little reply on my part is required to Mr. Edwards's later examples and criticisms (of October 31). They seem chiefly to illustrate the fact (so well known to all experimentalists) that a very large latitude of exposure is allowable with good quality plates, and, as Mr. Sinclair so clearly pointed out, no serious attempt was made to show that the same results could not have been got with any normal developer. Is it too much to ask Mr. Edwards to take a hint from my "crude and misleading" experiments, to develop one half of a plate with his redeveloping formula for twice the time of the appearance of the half-tones of the image, and the other half with a normal 2-grain pyro-ammonia developer for four and a half times the appearance, and then compare results by a print, not by eye only?

Alfred Watkins.

THE MERITS AND DEMERITS OF THE COMBINED TONING AND FIXING BATH.

[Croydon Microscopical Society.]

A somewhat voluminous correspondence on the above subject was carried on in the columns of The British Journal of Photography about the middle of the present year, which was disappointing in so far that it failed to elicit any reply on the part of the makers of gelatino-chloride papers as to *why* some of them recommended, and some did not, the employment of the combined bath. The following experiments and the deductions we draw from them we lay before the members of the Society this evening, more in the hope of eliciting useful discussion and practical research than in settling what is necessarily a complex question.

The three principal indictments brought against the process are—1. Yellowing of the whites. 2. Double toning. 3. Fading. And we have no hesitation in saying that all these charges may, under certain circumstances, be substantiated. The question arises, therefore, Under what circumstances? We have here several pieces of paper (gelatino-chloride) of different makes, some of which have been immersed in the combined bath for fifteen minutes, washed very thoroughly (Wood's washer) for two hours, and then a weak solution of ammonium sulphide painted over half the paper. A deep brown stain resulted, though some of the papers were darker than others. Some more pieces were next soaked in a solution of lead acetate (one grain to the ounce) for fifteen minutes, well rinsed, and then soaked in freshly made fifteen per cent. hypo for fifteen minutes, and thoroughly washed as before. On painting half these over with the sulphide, a brown colour, differing hardly from that before obtained, was manifest. Another piece of paper was soaked in fifteen per cent. hypo for one and a half hours, and then well washed for four hours. On painting this, a very feeble discolouration was observed. Yet another piece of paper was soaked, first in fifteen per cent. hypo for one and a half hours, then in ten per cent. ammonia for half an hour, and finally washed for four hours. In this case only the very slightest tinge of brown was noticeable. Lastly, a piece was soaked in twenty per cent. hypo strongly ammoniated for half an hour, and washed for twelve hours. In this case the sulphide produced no effect whatever, the paper remaining perfectly white. Having now succeeded in producing a paper insensitive to sulphide, and consequently free from silver, we took some of this specially prepared paper and soaked some of it in the combined bath in which the gold was omitted, and some in the dilute solution of lead acetate—lead being, of course, the only metal present in both cases—for fifteen minutes (the average time taken for toning), and then washing for six hours. In each case the sulphide produced a deep brown stain, and, what is more to the point, the paper itself was stained, if anything, deeper than the gelatine surface.

We also examined some of the black metallic-looking deposit which s always formed on the bottles in which the combined bath is kept, and the more the bath has been used the greater the quantity of this deposit, with the result that a large quantity of silver and an appreciable quantity

of lead existing as sulphides was found. The question has often been asked, but, as far as we are aware, never answered, why lead is used in these combined baths at all, especially seeing that it apparently serves no useful purpose.

The deductions to be drawn from the above observations are, that the combined bath, particularly if it contains, as is usually the case, lead and alum, is at all times a risky thing to use, for at least three obvious reasons: 1. Toning may be complete before fixation, and thus silver left in the print. 2. The elements of sulphur toning are always present. 3. The difficulty of removing the last traces of lead. If a combined bath must needs be used, we strongly suggest that it should contain nothing but hypo and gold, with or without ammonium sulphocyanide, and that on *no account* should it be worked to death; use as much of it as necessary to tone the print in hand, and then throw it away.

As it may be said that the combined bath is suited to some papers and not others, we may state that our experiments were conducted with four of the leading papers in the market, and that they all gave practically the same result. In conclusion, we would ask whether the time saved in the preliminary washing and toning before fixation, which is permissible with the combined bath, is sufficient to set against the almost certain risks we have pointed out? and we would further ask those who can *give proof from experience*, and not merely theory, to publish their results. J. H. Baldock, F.C.S.

A COPYRIGHT CASE.

In the High Court of Justice, before Mr. Justice Collins, on Thursday, November 15, the case of Ellis *v.* Ogden, Smale, and Co., Limited, was heard. It was an action brought by Mr. Alfred Ellis, photographer, carrying on business at 20, Upper Baker-street, W., against the printers and publishers of the *Ludgate Monthly* for having infringed his copyright in the photographs of two celebrities—Mr. Harry Nicholls and Mr. Charles Kenningham. Defendants denied that the plaintiff was the owner of the copyright in the photographs.

Mr. Scrutton appeared for the plaintiff, while Mr. Ruegg represented the defendants.

Mr. Scrutton, in opening the case for the plaintiff, said the action was brought to settle the question so far as his client was concerned as to whether the copyright of a photograph, which was not taken on the usual terms, but on the invitation of a photographer, was in the photographer, or whether the proprietors of illustrated journals were entitled to reproduce the photograph if they were given a copy. The plaintiff was not bringing the action to put money into his pocket, but to obtain an injunction restraining the defendants from reproducing any further photographs of which he was the author. In addition to the photographs in question, the defendants had reproduced others.

Mr. Justice Collins: The whole question is whether either of the persons gave good or valuable consideration.

Mr. Ruegg said his case was that the photographs were taken in the ordinary way.

Mr. Justice Collins: If a celebrity goes to a photographer, and says, "I will give you permission to exhibit as many copies of my photograph as you like if you allow me to have copies when I want them," might not that be a good consideration?

Mr. Scrutton: The first question is whether the negative was made or executed on behalf of another person.

Mr. Justice Collins: A celebrity might desire to present copies of his photograph to the lady whom he is engaged to be married. Although a celebrity, he might not have enough money in his pocket to pay for them (laughter), and he might say, "I have not money enough to pay for my photograph, but I am a celebrity, and I will give you permission to exhibit as many copies as you please if you will take my photograph and let me have copies." It is a question of fact.

Mr. Scrutton, continuing, said in 1891 Miss Kate James was taking a part in a piece known as *The Sailor's Knot* at Drury Lane Theatre, and the plaintiff asked her if she would come to his studio and have her photograph taken. Miss James thought that the photograph would be much more attractive if Mr. Harry Nicholls was taken also, and she asked whether he might come with her. Plaintiff replied in the affirmative, and in the result both Miss James and Mr. Harry Nicholls visited the plaintiff's studio. After Miss James and Mr. Nicholls had had their photographs taken in costume in various positions, plaintiff asked Mr. Nicholls if he would sit to have his photograph taken in private clothes. He agreed to do so, but no charge was made. About 6*l.* worth of prints was sent to Mr. Nicholls, for which he was not charged. Later, Mr. Nicholls sent an order for two dozen cabinets, and for these he was charged the price for copies. With regard to Mr. Kenningham, in 1892 he was playing in *Haddon Hall*, and on the invitation of the plaintiff he attended at the studio and had his photograph taken in costume and in private clothes. He (the learned counsel) submitted that the copyright in the photographs belonged to the plaintiff, and that the defendants had no right to reproduce them.

Plaintiff was called, and bore out the opening statement of counsel. The photographs in question, he said, were taken at his sugggestion and no charges were made for them, except when further copies were required. He had registered both photographs. Reproductions in illustrated journals interfered with the sale of photographs. In cross-examination, plaintiff said he had given the defendants permission to reproduce other photographs on paying a certain fee.

Mr. F. Bishop, partner of the firm of Marion & Co., said his firm dealt largely in photographs, especially of celebrities. Reproduction by illustrated journals interfered with the sale of the photographs of celebrities.

This concluded the case for the plaintiff.

Mr. Harry Nicholls was called on behalf of the defendants. He said he was an actor, and in 1891 he was playing in *The Sailor's Knot* at Drury Lane. After the plaintiff had taken him and Miss James in costume, he (witness) suggested that he should give the plaintiff a sitting in private clothes. He sat for the photograph, and in due course he received the proofs, and gave an order for two dozen, for which he paid. He gave a copy to the proprietors of the *Ludgate Monthly* for reproduction, and he had no idea that the plaintiff claimed the copyright in the photograph.

Mr. Charles Kenningham, actor, stated that he was now engaged at the Lyric, and that in 1892, while playing in *Haddon Hall*, he went to the plaintiff's studio, and was photographed in costume. Having been taken in costume, he asked the plaintiff to take him in private clothes. He received the proofs, and afterwards he ordered certain copies, for which he paid. He gave one of the copies to the defendants for reproduction.

Mr. Justice Collins said the question he had to decide was one of fact. The evidence of Mr. Nicholls and Mr. Kenningham showed clearly that the photographs in question were taken at their request, and that they paid for them. That being so, he held that they were taken on behalf of those two gentlemen for valuable consideration, and that the defendants were entitled to his judgment with costs.—*Daily Chronicle.*

[In reference to the foregoing case we have received the following communication from Mr. Joseph J. Elliott:—

"Please remember that this is *not* a test case, and in no way affects the fact that a photographer taking a photograph of a celebrity on his own account, and without payment, has the copyright vested in himself. The only point the judge had to decide was, whether Harry Nicholls gave Mr. Ellis a commission to take his photograph in the *plain* clothes for valuable consideration, or whether Mr. Ellis took it on his own account. No doubt was suggested that the copyright of those taken in costume at the invitation of Mr. Ellis was his property, and it is most important that photographers, journalists, and the public generally should understand this. The action was not undertaken by the Photographers' Copyright Union. Mr. Ellis brought it independently on his own account, and did not even consult our solicitor, or it would never have come into court."—Ed.]

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

There was a Council Meeting of the above Association on November 9, 1894, at Anderton's Hotel, London, present: T. Fall (President, London), Messrs. H. J. Whitlock (Birmingham), Lindon Berry (Aberdare), Bromwich (Kidderminster), A. Priestley (Egremont, Liverpool), Eddison (Barnsley), J. Crosby (Hon. Treasurer, Rotherham), Weston (London), Jennings (London), Illingworth (Halifax), Langton (Sheffield), R. Keene (Burton), W. Barry (Hull), Harold Baker (Birmingham), G. V. Yates (Sheffield), Gill (Colchester), Marsh (Bognor), Spink (Brighton), &c.

Some twenty letters of apology for non-attendance were read. Certificates of membership had been sent out to some 150 professional photographers in Great Britain and Ireland, New Zealand, South Africa, &c.

The proposition to establish a Photographers' Co-operative Association for Supply of Goods had not met with sufficient support to warrant the project being proceeded with, and the proposed meeting in Liverpool for its furtherance had, therefore, not been held.

The "free portrait" dodge had been cropping up again in different places under different names, such as the Aerinda Portrait Company, London, and the Photograph Coupon System, the latter a most injurious proceeding as regards the profession and the repute of all local photographers.

Ten new members had joined the National Association of Professional Photographers, and there were some resignations received.

Mr. H. J. Whitlock (Birmingham), one of the Vice-Presidents of the Association, is the owner of the only photographic portrait of the late Lord Chief Justice Coleridge. This portrait (copyright) having been used without his permission, or even the civility of naming the matter to him first, Mr. Whitlock commenced legal proceedings against the proprietors of the *Illustrated News*, *Graphic*, &c., the result being a cash payment to Mr. Whitlock and the stay of proceedings.

The case of Mr. Dunning (Usk, Mon.), who successfully took proceedings to assert his copyright to "negatives," and also another member of the National Association of Professional Photographers, in a similar successful proceeding, were referred to.

Some members having inquired for the names of insurance companies willing to treat professional photographers reasonably and fairly, the Phœnix and the Bird in Hand had been recommended.

A case of immense interest to the profession was named, Mr. Harold Baker (a member of the National Association of Professional Photographers) had some years before returned to a certain firm several thousand cards for *cartes*, with his name and address on, as they were defective. A person called on Mr. Baker, asking him if he "did those common photographs for the barrow men," and showing one of such, which had been hawked about Liverpool on the occasion of the recent Royal visit.

Feeling how injurious such a state of things was to his reputation as a photographer, and especially as one could not see where the end of it would be, or to what purpose such cards might be applied. Mr. Baker instructed his solicitors (Messrs. Johnson, Barclay, & Rogers, Birmingham) to write to the firm for an explanation. Mr. Johnson was Mayor of Birmingham last year, and the firm is one of very high standing and respectability. It seems that the firm treated the matter very lightly, but, finding that the matter was not to be dealt with in that fashion, and that "service of a writ" was required by Messrs. Johnson, an agreement, *pro tem.*, was made and signed, staying proceedings, and giving such undertakings as Mr. Baker's solicitors required.

It is very evident, from this case and others which have occurred, that it is absolutely imperative that manufacturers should not, under any pretence, dispose of goods which are rejected or returned defective, with the name of a customer thereon, but that they should be firstly rendered useless for resale, to the almost certain business detriment of the person whose name they bear. No other course can be excusable under any circumstances.

The annual meeting will be held, as per by-laws, the second Thursday in February, 1895, at Leeds, at which it will be proposed to make certain alterations for the reconstruction of the Association on somewhat different lines to the present, and certain resolutions were passed to be laid before the annual meeting.

The members subsequently dined together at Anderton's Hotel, where many subjects of professional interest were discussed, and an agreeable time passed by gentlemen who have but too few opportunities of meeting for either trade or social communication.

An adjournment was made to be present at a demonstration of electric lighting as applied to photography, by Mr. Adamson, of Glasgow, at his Oxford-street studio.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Sir H. Trueman Wood, President of the Royal Photographic Societyr formally opened the Hackney Society's Exhibition on Tuesday, November 20, at Morley Hall, and in doing so pointed out the opportunities which photography afforded for the cultivation of artistic and scientific tastes. Seconding a vote of thanks to Sir Henry for his presence, Mr. Horsley Hinton took occasion to speak of the high esteem in which the Royal Photographic Society is generally held.

The Exhibition, of which the Judges were Mr. Blanchard, Mr. Ralph Robinson, and Mr. E. J. Wall, was unquestionably of great merit, and possibly better than any of its predecessors. The improvement and all-round good quality manifested in the members' classes was most marked, and it would now be difficult to name any photographic society which boasts of a larger percentage of clever workers than the Hackney. In the open classes many of the exhibits had already become celebrated; but the average of quality here was perhaps scarcely as high as on former occasions.

In Class A a bronze medal was awarded to Mr. Fenton-Jones for a pretty view, *A Norwegian Village*, nicely printed on rough paper, Mr. J. Carpenter taking the silver for a soft landscape study, *The Common—Summer*, a like award being obtained by Mr. S. J. Beckett for a capital figure study, *An Old Campagnian Shepherd*.

In the next class (B) the same gentleman was equally successful for a representation of a Neapolitan woman *Net-making*. *O'er the Misty Lea*, a charming little study of a tree-lined river view, won Mr. G. S. Pasco a silver medal. The all-conquering Mr. Beckett got yet another silver medal for a beautifully photographed, evenly lighted interior, *In the Cloisters, Ravenna*. Mr. J. O. Grant was, as usual, to the fore with some clever Zoo studies, a bronze medal going to him for a portrait of a lion. We have only space to mention, in the three classes, the singularly able work shown by Messrs. Barker, R. Beckett (architecture), C. B. Ansell (*Warwick Castle*), Sodeau, and Dean.

The Open Landscape Class (F) was not perhaps, on the whole, a particularly strong one. Mr. Horsley Hinton was easily first (silver medal) with his finely rendered *Thames Estuary*, the effectiveness and realism of which grows on acquaintance. Mr. Mummery took the bronze with his Pall Mall exhibit, *When Day Declining*. Prominent exhibitors in this class besides those named were Mr. Striglitz, Mr. W. Howell, Mr. Warneuke, and Mr. S. J. Beckett.

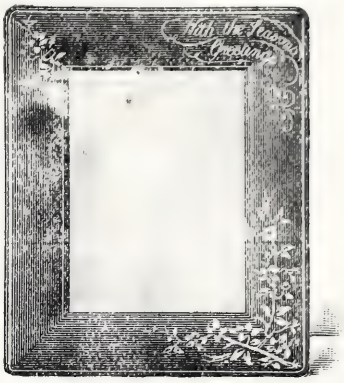
Class G (Portraiture and *Genre*) was a capital one. The silver medal went to Mr. Eickemeyer for a clever and amusing study of a family group surveying *The Kitten's Breakfast*, and Mr. P. S. Lankester thoroughly well deserved his bronze medal for a portrait study, a soft, charming, and very delicately rendered head, *Clytie*. Mr. Lankester's other portraits were also noticeably good. The gold medal of the Champion Class was awarded to Mr. Eickemeyer for his now-familiar and always-welcome *Sweet Home*. In addition to those named, Mr. R. Beckett, Mr. W. J. Byrne, and Mr. A. W. Wilson showed exceedingly good portraiture, the first-named being specially happy with a lifelike portrait of Mr. J. O. Grant.

The lantern slides were placed on view in a separate and remote room, admission to which was threepence.

Apparatus was a strong feature of the Exhibition, the following firms, among others, having most varied and interesting displays:—Messrs. Watson & Sons, B. J. Edwards & Co., J. F. Shew & Co., Holmes & Watson, F. Steele (lenses), Platt & Witte, Henry Park, &c. On the whole, the Hackney Exhibition was good and interesting throughout.

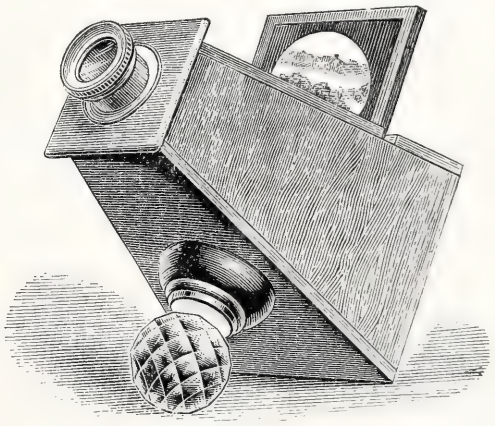
Our Editorial Table.

Mr. Jonathan Fallowfield sends us samples of seasonable leather frames, each with a strut behind for supporting it in a nearly erect



position. The cut affords an excellent idea of the gold ornamentation of the frame.

Since describing the hand lanternscope of Mr. Chipper, of Highgate-hill, N., we have received from him the accompanying cut, which



shows better than by any mere verbal description its precise external form. It has a cut-glass ball for holding it by, a ground glass at the base of the pyramid, and a meniscus achromatic eyepiece by which sharpness is ensured.

The *Photogram* Folio has been received from the editors of our contemporary. It forms a very useful cover for the numbers of that journal, and there is special provision made for keeping clean and harmless such loose pictures as are issued as supplements.

Mr. Alfred Werner, Dublin, has sent us a portrait, head and shoulders, taken direct. The peculiarity about it is that, although taken direct, it is twice the size of life. It is a bold, effective picture, and to be seen at its best a distance of ten or twelve feet should be allowed to intervene. It is a triumph of technical skill.

Leytonstone Exhibition.—This Exhibition will be opened by Lady Warner on Thursday, November 29, when a collection of photographs will be shown from America, Australia, France, &c., in addition to pictures of English scenery. The evenings will be enlivened with music, lantern displays, lectures, &c. The Judges are Messrs. Andrew Pringle, Horsley Hinton, and Bernard Alferi. All exhibits should be addressed to the Secretaries, and should reach The Studio, High-road, Leytonstone, not later than Saturday November 24.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,843.—"Improvements in Photographic Cameras." Communicated by A. Lefebure. A. J. BOULT.—*Dated November*, 1894.

No. 21,957.—"Improvement in Photographic Lenses." G. PRESCOTT.—*Dated November*, 1894.

No. 21,968.—"Improvements in or relating to Photographic Cameras." C. C. VEVERS.—*Dated November*, 1894.

No. 22,013.—"Improvements in Apparatus for Imparting a Predetermined Temperature to Liquids for use in Developing Photographic Plates and for other purposes." C. E. HEARSON.—*Dated November*, 1894.

No. 22,069.—"An Improved Holder or Lifter for Photographic Plates and suchlike Articles." F. ILES.—*Dated November*, 1894.

No. 22,105.—"Improvements in Apparatus for Producing Photographic Enlargements from Photographic Negatives or Positives. J. GAGE.—*Dated November*, 1894.

No. 22,189.—"An Improved Developing Film or Plate-holder." F. DAVIS.—*Dated November*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
26	Camera Club	*Matabele War Notes.* Captain C. H. W. Donovan, A.S.C.
26	Central Photographic Club	*Lantern Slides.* C. H. Oakden.
26	Devonport	*Photographic Tips and Dodges.* R. Rugg Monk.
26	Lantern Society	
26	North Middlesex	*Analytical Chemistry for Photographers.* E. Benest.
26	Putney	
26	Richmond	*Reproduction and Half-tone Work.* R. L. Kidd.
26–Dec. 1	South London	Sixth Annual Exhibition.
27	Birmingham Photo. Society	
27	Brixton and Clapham	Informal Meeting.
27	Hackney	*Retouching for Beginners.* W. L. Barker.
27	Halifax Camera Club	
27	Lancaster	
27	Leith	
27	Newcastle-on-Tyne & N. Counties	
27	Paisley	
27	Royal Photographic Society	Demonstrations by A. Pringle.—Adjourned Discussion on Mr. Warnerke's Paper, *Chromatic Photography.*
27	Warrington	
28	Bath	
28	Burnley	
28	Croydon Camera Club	Members' Slides.
28	Leytonstone	
28	Photographic Club	*Ireland.* F. W. Hindley.
28	Southport	
28	Stockport	
29	Camera Club	*From Far to Near East.* H. H. O'Farrell.
29	Ealing	Discussion *re* Exhibition.
29	Glossop Dale	
29	Halifax Photo. Club	
29	Hull	
29	Liverpool Amateur	*Mexico.* Charles Lancaster.
29	London and Provincial	Open Evening.
29	West London	Developers.
29	Oldham	
30	Cardiff	
30	Central Photographic Club	*The Exposure, Development, and Toning of Bromide Opals.* W. Ethelbert Henry.
30	Croydon Microscopical	
30	Holborn	
30	Maidstone	
30	Swansea	
December. 1	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 15,—Mr. F. B. Grundy in the chair.

Mr. F. W. PASK having stated that he would be unable to continue the office of Librarian, a vote of thanks was passed to him for his services, and Mr. J. E. Hodd was elected to succeed him.

The HON. SECRETARY read a letter from Mr. W. K. Burton, one of the earliest members of the Association, who stated that he hoped, at an early date, to send a paper to be read before the Association.

Referring to the placing of bromide paper in ordinary dark slides for enlarging purposes, Mr. HODD stated that he found Fitch's film-holders (which are coated with an "ever-moist" rubber solution) useful for the purpose.

Mr. R. Beckett showed an amidol-developed bromide print from a negative of an old engraving. The quality of the print (made on Fry's Argentotype paper) was much admired.

IMPROVING THE TONES OF BROMIDE PRINTS.

Mr. W. E. HENRY demonstrated various methods of improving the tones of bromide prints. In a few prefatory remarks, he said that, in dealing with large numbers of bromide prints, he had been troubled with under and over-exposure, and he had to find a method of rendering such prints suitable to be sent out. He did not use ferrous oxalate, but hydroquinone and the other modern developers, which he found cheaper and gave better effects. But with hydroquinone and the carbonates, and especially where bromide was used, he sometimes got greenish-brown tones. Speaking of opals, he referred to edge-markings, due to the plates being stale, which he got rid of by reduction most successfully with iodine and potassium cyanide. The employment of a used developer with prints that came up flat improved them. Coming to the methods he used, Mr. Henry first proceeded to treat some bromide prints consisting of a uranium solution made as follows :—

Uranium nitrate	10 grains.
Potassium ferridcyanide	10 ,,
Acetic acid	½ ounce.
Water	10 ounces.

The longer the time the prints were left in the solution the redder the tone. Several prints were successfully treated in this solution. A question arising as to the occasional fading of unranium-toned bromide prints, Mr. A. HADDON gave it as his opinion that it was caused by the unremoved silver attacked by the ferridcyanide.

Mr. Henry next demonstrated the reduction of bromide prints by means of a highly dilute solution of iodine and cyanide of potassium.

The CHAIRMAN asked for an explanation of the reducing action, inasmuch as iodide of potassium would be formed, which, unlike free iodine, would not attack the image. No explanation was forthcoming.

Finally, Mr. Henry showed the advantages of a gold and sulphocyanide toning solution for strengthening weak bromide prints. During the demonstration he replied to various questions addressed to him, and at its close received a vote of thanks.

PHOTOGRAPHIC CLUB.

NOVEMBER 14,—Mr. Thomas Bedding in the chair.

Mr. BRIDGE showed some stereo slides printed on gelatino-chloride paper. The negatives were made at the Convention, and he had had them about two months. They were all right at first, but were now fading in parts. No cause was assigned for the phenomenon.

Mr. FOXLEE showed several Daguerreotypes, one of which proved that the exposure had not been so long as present-day photographers thought was necessary for the process.

Another showed that there *were* lenses in those days that did *not* give distortion. All the examples were much admired.

Mr. H. WILMER showed a photogravure plate, measuring 12×8, etched by himself by the process demonstrated by him before the Club some time since. He exhibited this plate because it was steel-faced ; in which condition members might like to see it.

The HON. SECRETARY read a communication from Mr. A. Watkins, in reply to Mr. Edwards's criticisms of his paper, entitled *Timing Development* [see p. 745].

In the course of a short discussion, the CHAIRMAN said that it appeared to him Mr. Watkins had sustained his previous position.

Mr. FRANK HAES drew attention to the fact that the measurement of the apertures of the Zeiss lenses, compared with their focal length, appeared to place English lenses at a disadvantage, viz., that a lens (series 4) marked *f*·10 was in reality *f*·11·3. The difference came about through the system of measurement, the English plan being to measure the aperture, and the German to measure the beam of parallel rays projected. But, inasmuch as the fact was not generally known, it was, as he said, placing the English lens at a disadvantage.

A vote of thanks was passed to Mr. Watkins for his paper.

Lantern slides were shown by Messrs KLOSZ & TAGLIAFERRO.

North London Photographic Society.—November 6.—The Annual General Meeting was held at Canonbury Tower, when the undermentioned were elected officers for the ensuing year :—*President :* Mr. J. Traill Taylor.—*Council :* Messrs. W. Bishop, J. Douglas, J. Oakley, E. W. Parfitt, and A. E. Smith.—*Curator :* Mr. W. Few.—*Hon. Secretary and Treasurer :* Mr. W. T. Coventon, 50, Highbury-park. The accounts for the past year showed a satisfactory balance in hand.

Putney Photographic Society.—November 5, Talk by Mr. John A. Hodges, *About Lantern Slides*, Dr. Sheppard (Vice-President) in the chair.—Mr. HODGES commenced by saying, To produce a really good slide, there must be a negative possessing a good range of gradation, the shadows not being too clear nor the high lights too dense. Speaking of a hard negative and the treatment, he first intensifies with the uranium intensifier, allows it to dry, and then, with a finely pointed hair brush, apply any alkaline solution to the parts which are too dense ; this discharges the colour in those parts, and leaves the clear glass shadows in their intensified condition. In regard to the plates which could be used for making slides, collodio-bromide were the most popular, and next to them wet collodion, by the latter process fine results being obtainable if properly worked, but, if not, some of the vilest results could be achieved. The albumen process was capable of giving most beautiful results, the great difficulty in working it being to retain the films on the glass when washing. Rubbing the edge of the glass with a file was a remedy, or else edging it with indiarubber solution. In regard to the vexed question of the superiority of slides made by reduction as against those made by contact, Mr. Hodges has come to the conclusion that slides can be made by either method, absolutely indistinguishable from each other as regards quality. A good deal of the criticism against slides made by contact, arises from the fact that there is a great temptation to use more of the negative than will produce an artistic picture, and this is not so likely to be the case when the slides are made by reduction, especially as slides made by the latter method are more severely masked than by the former. The carbon process is capable of producing very fine results, and gelatino-chloride plates worked at their best run any other

process very closely, and great care should be taken not to use the plates stale. As to the development of slides, either pyro or hydroquinone will give good results; for warmer tones the former being the best, and, if such tones are desired, the developer should be weak in its constituents, a longer exposure given, and a relatively large proportion of restrainer used. For cold tones, ferrous oxalate is not to be beaten as a developer; it gives a finer black than can be obtained with any other developer, and Mr. Hodges stated that some of his finest results had been obtained with it. To make successful slides from thin negatives he generally adopts the following method, by giving a short exposure and developing with a weak and well-restrained hydroquinone developer, and before any veiling takes place fix in hypo; the slide is then most thoroughly washed in running water; this removes the only chance of failure in the process; the slide is then bleached with a mercury intensifying solution, and, if it only requires a little density, allow the mercury to act a very short time, but, if a great amount is required, bleach until it is thoroughly white; removing the plate from the solution, it is again thoroughly washed and redeveloped with dilute hydroquinone developer; when it is sufficiently dense, put it in the fixing bath again, and finally wash. Mr. Hodges remarked he found the transparency of the shadows obtained by this method is not equalled by any other process. If a slide should be over-developed, it can be reduced, viz, thoroughly wash after the fixing bath and place in a weak solution of perchloride of iron, about ten drops to one ounce of water, and two drops of hydrochloric acid; soak the plate in this solution, watching it carefully, and removing it when sufficiently reduced; if this fails to effect the necessary reduction, take one or two drops of the hypo bath with a glass rod and put them in one ounce of water, and without washing the slide put it into this solution; this will reduce the strongest slide. The question of masks for the slides was an important one. For architectural subjects square masks were generally most suitable, cushion shapes rarely, if at all. The use of oval masks is very much to be deprecated. Pictures should be masked, so as to get rid of anything which did not contribute to the ultimate artistic effect of the slide. Long panoramic masks were to be avoided, and circles required to be used very carefully. Examples of various types and colours of slides were thrown on the screen, and Mr. Hodges explained their methods of productions, giving hints as to the features to be avoided, &c.—A short discussion followed, and a vote of thanks to Mr. Hodges by Dr. C. WYMAN concluded the proceedings.

Woolwich Photographic Society.—November 8.—Mr. H. J. DALBY gave a lecture entitled *Dodging Negatives*, in the course of which the lecturer said that he did not pretend to be able to introduce anything that was new, but he hoped that, in treating the subject in a practical way, it might be useful. Of course, it must be borne in mind that the best results are always obtainable from a negative correctly exposed and properly developed, but it frequently happened that it was next to impossible to give the correct exposure, and then recourse must be made to dodging. It is an easy matter to determine when developing a plate whether it is under-exposed or over-exposed. As a rule, amateurs are not quick enough to determine this, and to decide what is necessary in such cases where under-exposure is apparent, the plate should be instantly taken out of the developer and put in another dish and flooded with water. There is enough of the developer left on the film for the development to proceed to bring out detail in the shadows. In the case of over-exposure, the plate should be flooded with pyro solution. If from any cause the plate is too dense, then reduce with ferrid-cyanide of potassium and hyposulphite of soda, the proportions are not of great importance. With the solution general reduction was easily obtainable, or, if necessary, it was easy to reduce parts of the negative with the aid of a small camel's-hair brush; in the latter case it would be essential to have running water at hand, in order to be able to constantly check the action, and to prevent ugly marks on the image. Methylated spirit could be used for the same purpose. If intensification was necessary, then he recommended bichloride of mercury and ammonia, for the amount of intensification could be regulated either by the deposit of the mercury or by the strength of the ammonia. Thorough washing is needful at each stage, and if it be found that there is too much of the bichloride of mercury on the plate, it may be washed off again by prolonged washing. The results are permanent—that is to say, if the plate is afterwards varnished, and if negatives are worth keeping they should all be varnished. Speaking of interior work, the lecturer recommended that, as proper exposure was generally not obtainable, it is as well to compromise matters; that is to say, that if the shadows would take three hours and the high lights an hour, then give, say, an hour and a half, and depend upon matt varnish to correct matters, by scraping away portions covering the high lights. The specimen passed round will show where this has been done, and it will be noticed that several parts have been locally reduced. If the matt varnish does not give sufficient density, a coloured varnish can be used. Any spirit varnish stained with dragon's blood will do; you can make it yourselves with a little shellac and spirit, and it will not cost so much as matt varnish. For retouching a sloping desk is required, with means of reflecting light upon the negatives, which may be worked with a 3 H Faber's pencil. The knife is sometimes useful, for you may take out parts of one negative and insert them in another. In dealing with cracked negatives, the best way is to make a transparency from it, and then work out the lines as much as you can on this, and then make another negative from your transparency, taking out the last signs of the cracks, and you will often find that you have a better negative than the original one. The lecturer during the evening gave many practical illustrations, and at the close a very hearty vote of thanks was accorded to Mr. Dalby, who in response said that it gave him great pleasure to be able to address his fellow-members.

Halifax Camera Club.—November 6.—Mr. A. C. BALDWIN, the representative of the Eastman Photographic Material Company, London, gave a very full and descriptive account of the progress of the Company, and of their manufactures, with a detailed instruction as to manipulation of apparatus and treatment of papers in order to secure the best possible results. He supplemented his remarks by developing several prints on their Solio paper, and showed what a variety of tones it was possible to obtain.

Leeds Photographic Society.—November 8.—Mr. B. A. BURRELL, F.I.C., delivered a lecture on *Some of the Chemicals used in Photography*. At the outset Mr. Burrell explained the difference between elements and compounds, atomic and molecular weights, &c. As an illustration of the union between two elements to form a compound, the lecturer selected silver and iodine, applying heat to the mixture, the compound potassium iodide being formed. An important substance dealt with was water. It was of the utmost importance to the chemist that the water used in various operations should be as pure as possible, and this applied with equal force to the photographer in many of his solutions. Natural waters never are pure, containing more or less lime, magnesia, sodium, &c., in the form of carbonates, sulphates, and chlorides. Taking a well water used in one of the villages near Leeds, Mr. Burrell showed his audience by means of various tests how heavily charged with salts this water was, declaring it to be totally unfit for photographic purposes, the silver salts being affected by the chlorides, and the ferrous-oxalate developer being spoilt by the lime present in the water. Leeds water, Mr. Burrell pointed out, did not contain sufficient salts in solution to cause anxiety to the photographer, save in some of the more delicate operations. Passing on to photographic chemicals, the lecturer dealt at some length with hyposulphite of sodium, stating that it was somewhat remarkable that, although this was the cheapest chemical the photographer had to buy, he often tried to get an unlimited amount of work from a very limited quantity of the salt. This was a grave mistake, and laid the foundation for fading in both negatives and prints, owing to the formation of the insoluble variety of the double hyposulphite of sodium and silver when the hypo solution was too weak or had become exhausted. To guard against this it was best to use a fairly strong solution. Mr. Burrell next dealt with some of the more important silver salts—the nitrate, chloride, iodide and bromide, pyrogallic acid, ammonia, &c. Liquor ammoniæ was one of the most unstable compounds the photographer had to deal with. It was simply a solution of ammonia gas in water, but the amount of gas dissolved depended on the temperature of the solution, any rise in temperature causing the gas to be given off and the solution weakened. Ammonia was sold as having a specific gravity of ·880, but it seldom was of that strength, and some amusement was caused by Mr. Burrell testing before his audience by means of an hydrometer a sample purchased on his way to the meeting, which had been bought as ·880, but which showed a specific gravity of ·950, or only one-third of its full strength. A considerable discussion followed the lecture, and the meeting closed with a vote of thanks to Mr. Burrell, and a hope that, at some future time, he might see fit to go a little deeper into a subject of such interest to photographers, and which he kindly agreed to do.

Leicester and Leicestershire Photographic Society.—November 8, the President (Mr. J. Porrett) in the chair.—Two members were elected. The Exhibition of members' work was fixed for Wednesday and Thursday, February 13 and 14, 1895, in the Co-operative Hall, and the Exhibition Committee elected comprising Messrs. Bankart, Toon, Jarrow, Robbins, Squire, Dunmore. The HON. SECRETARY then gave a short practical demonstration on *Collotype*.

Liverpool Amateur Photographic Association.—November 15.—Mr. A. Tyrer entertained the members and friends at a Smoking Social previous to his retirement from the post of President. The Association is fortunate, apart from its scientific nature, in having a good array of talented musical members, who, with the assistance of a few friends, contributed an excellent and enjoyable evening's amusement. Among those who took part in the programme may be mentioned Drs. C. W. Haywood and Llewellyn Morgan, Messrs. C. H. Lodge, H. Jennings, William Tomkinson, L. Hobson, — Marshall, J. D. Costine (mandoline), W. H. Yorke, and — Hampshire (recitations). Mr. H. E. Blenkarn acted as accompanist, and also sang a couple of good humorous songs.

Midland Camera Club.—November 7. The PRESIDENT (Mr. H. R. Leech) opened a discussion on *Films versus Plates*. After briefly referring to his experiments with Eastman's stripping films and Pumphery's flexible films, he gave his experience of Carbutt, Thomas, Fry, England, Fitch, Edwards (father and son), and for his Scotch tour this summer had used Eastman, Imperial, and Mawson & Swan, passing round film negatives illustrating his remarks. The chief prejudice against films was the difficulty in developing, owing to the film curling, buckling in the tray. For single films, the best remedy was Tylar's plate-holder, the little stud keeping the film firm and flat. The easiest and quickest way to develop the Eastman roller-film was with a broad camel's-hair brush. The President developed a twelve-exposure spool before the members, using the brush and amidol developer. As the film had to be handled much more than the plate, amidol or metol were recommended as being less likely to stain hands or film. If you had no objection to appearance, then pyro soda or velox were very good. The advantages of films were saving in weight, freedom from breakage, saving of time in developing, fixing, washing, and drying; advantage on carbon printing of using either side without any loss of definition, small compass when stored, and easy and economical transmission by post. Mr. BAILEY, in defending plates, said the President had brought no strong objection to glass, except weight, and any lover of photography would never mind that. After a very clear and able description of the chemical composition of films, practical examples of defects in films were shown to the meeting. The chief defects shown were warping and shrinking of the celluloid, stains and mottling from using the celluloid before it was properly cured, pin-holes and spots in otherwise very fine negatives, not accurately cut, and when used with a film-holder were nearly the same weight as glass. Mr. Bailey differed from the President about the washing and drying being easier than plates; his experience was just the reverse. He found great difficulty in making lantern slides. The same emulsion spread on glass and films differed greatly in the final results. Dr. EDWARDS very strongly supported glass, and mentioned the electrical phenomenon with its curious results on the negative. Mr. COOPER gave a graphic description of his difficulties in printing from a series of negatives of New Zealand and Australia, which were developed by the Eastman Company. On the vote being put to the meeting, it was carried unanimously in favour of plates, the President explaining that he agreed with the majority and had only taken the part of films to create a discussion.

Rotherham Photographic Society.—November 6, Dr. Baldwin (President) in the chair.—Mr. J. LEADBEATER (Vice-President) gave a paper on *Bromide Printing*, and followed up his remarks with a practical demonstration of the process. With the aid of his lantern he successfully enlarged a micro-slide—the tongue of a cricket—on a piece of Morgan & Kidd's paper, 23 × 17 inches in size. The illuminant was mixed oxyhydro jet, the objective one-inch Crouch, and the developer Ilford hydroquinone.

Sheffield Photographic Society.—November 6, the President (Mr. Thomas Firth) in the chair.—A discussion took place with regard to competitions, and it was decided to have monthly competitions for new beginners only. Four new members were elected, after which the prize negatives in recent annual competition were handed round for inspection, and the prizes presented.—Mr. FIRTH introduced the subject of *Technical Education Grant*, for which the Society made application last year, but, after a lengthy discussion, it was decided not to make any further application, but to continue the Society on the same lines as heretofore.

Glasgow Photographic Society.—November 1.—There was a very large attendance of members and friends. The President (Mr. J. Stuart), in the chair.—After the formal business, the election of office-bearers for the year was proceeded with. The VICE-PRESIDENT (Mr. Lindsay Miller) then proposed Mr. Stuart to be re-elected President for this year, which was seconded by Mr. SAWBRIDGE, and was unanimously agreed to. The CHAIRMAN then proposed that the list of office-bearers be as last year, with the addition of Mr. W. Lang to the Council in room of Mr. Nicol, retired. This was heartily approved and unanimously carried. The Chairman then stated that a Salon night would be held in the second week of January, when there would be an Exhibition of work by the members, for which medals limited in number, or diplomas would be given for the best work. Details at the first meeting in December. He counselled members to be up and doing, so as to make the Exhibition worthy of Glasgow. It was expected that they might be able to keep the Exhibition open for a few days during the daylight, as there is no means of having the rooms well lit by gas. He also stated that he had offered a medal to the Council for the best set of six lantern slides, to be competed for by members of the Society. The voting will be by ballot of the members present. Details of the Exhibition to be left over until a future meeting. This meeting will be held as one of the "Popular Nights." The Chairman then introduced Mr. Baldwin, of the Eastman Company, to the meeting. Mr. BALDWIN, on rising, was heartily received. He said that, in coming to Glasgow, he felt that he had been put on his mettle; but, from the reception he received, he now felt at his ease. He started with a full description of the Kodaks, and, as might have been expected, left no point of importance in the dark. From the Kodak to the paper and films of the Company, he went down the whole list, spending over forty minutes on the subject. He was listened to with marked attention during the whole time. Well they might, as his paper was lucid and full of information, and he would be a very wise man who did not learn a good deal from Mr. Baldwin. The lecturer then demonstrated the toning and fixing of the platino-toning bath, which was very successful. During the toning and fixing of the print, members were invited to put any question to the lecturer. As Mr. Baldwin, in his description of one of the lenses in the Kodaks, stated that the diaphragms ranged from *f*-4 to *f*-256. Mr. FALCONER wished to know what size the opening of *f*-256 would be in a five-inch focus lens. Mr. BALDWIN did not seem prepared for such a deep arithmetical question, so the lens was examined, and it was found that the *f*-256 was not more than a pin-point opening. The question was not quite satisfactory, as he did not see the use of such an opening, which was followed by hearty laughter. After the demonstration, the CHAIRMAN stated that, from his own experience, he could bear out the statement made by the lecturer. As to the keeping quality of the paper, a roll had fallen aside for some eighteen months, which was sent to the works and printed as if it had been new paper. He moved a hearty vote of thanks to Mr. Baldwin for the instructive paper he had given them, and to the Eastman Company for sending him, which was carried with hearty approval. Mr. BALDWIN, in responding, said he was delighted with the manner they had listened to his remarks, and, if they had gained information, it would be an additional source of pleasure to him, and he would convey to the Eastman Company the motion of the Chairman and the hearty manner it had been responded to.

Photographic Society of Ireland.—November 9, Dr. Scott (President) in the chair.—The following address was delivered on the occasion, *The Camera: its Manipulations, its Capabilities, its Limitations*, by J. A. C. Ruthven. A. Werner, and L. R. Strangways. Mr. RUTHVEN, who introduced the subject, dealt with it in a manner which was most instructive to those present; he explained the uses of the different movements of the camera, and described various forms of swing-backs, rising-fronts, &c., and touched on many points of importance to users of cameras. Mr. A. WERNER described his large camera, and showed a head which he had taken twice as large as life direct from the sitter. He mentioned that with this camera he could produce heads thirty-six times or more larger than the natural size. Mr. STRANGWAYS followed with some useful remarks on the swing-back, and showed how he managed the tripod when taking high buildings, or when cases for tilting the camera presented themselves. He used the front leg as the back, drawing it between the other two. This method seems to give greater rigidity to the legs, and is certainly safer than any other way when the camera is pointing upwards. A lengthy discussion followed, during which Dr. SCOTT showed some diagrams he had made, and by which he explained the swing back, rising-front, &c. Dr. Beater, Messrs. Geddes, Woodworth, V. Smyth, and others, also took part.

Photographic Society of Japan.—September 28.—The President (Viscount Enomoto) excused himself from taking the chair, having to leave the meeting at an early hour, and Dr. E. Divers, F.R.S. (Vice-President) took his place. Messrs. A. F. Macnab and H. J. Sharpe were unanimously elected members of the Society. Samples of Ilford matt printing-out paper, Eastman's Solio matt paper, and platinum bromide paper, by the same maker, were distributed to such members as undertook to report the result of trial papers to the next meeting of the Society. Mr. K. Ogawa sent a set of collotypes by himself from negatives made in accordance with the methods of the "New School" of Photographers, sometimes called Naturalistics. One of the teachings of this cult is that nothing in a photograph should be as sharp as a good photographic lens can make it, and certainly in the prints shown nothing was quite sharp. The pictorial effect was generally admired. Mr. Y. Kobayashi showed a posing chair of ingenious design and excellent workmanship. The seat could be raised or lowered, and its angle could be altered. Attached to the back of the chair was a head rest, which could be altered to any position that could possibly be useful. A number of Burton actinometers (H. J. Burton) were shown. These are for timing the exposure of carbon prints. Each consisted of a film on which had been printed and developed six negatives, each of a greater density than that immediately before it. In using the actinometer, it is easy to judge to which of the negatives of the actinometer the density of the negative to be printed from in carbon most nearly corresponds. Sensitised albumenised paper commonly prints in about the same time as carbon tissue. It is therefore only necessary to place a scrap of such paper under the actinometer, and to expose this and the negative to be printed from in carbon together, to be able to judge the exposure necessary for the tissue.

Ealing Photographic Society.—November 15, Dr. Clifford Gibbons in the chair.—The Chairman introduced Mr. HERZFELD, who, with the assistance of a friend, gave a demonstration on *The Toning, &c., of Engelmann's Ideal Silver Platinum Paper*, and also passed round finished prints, which were much admired. This paper, which is very easy to manipulate, is treated precisely as any ordinary printing-out paper, and tones readily to a warm sepia or platinum black; it has a fine matt surface. The toning bath is simple to make, or it can be procured in tubes ready mixed and needing only the addition of water. Another advantage claimed for this paper is that it does not curl in drying, but remains quite flat. Thereafter exhibition details were discussed and a Hanging Committee were elected.

Northern (Wood Green) Photographic and Scientific Association.—November 15.—Numerous interesting objects were exhibited by the aid of microscopes brought by three of the members. Explanations were given by the exhibitors, and an instructive evening was passed. A short discussion followed upon the subject of varnishing photographic negatives, one of the members having described sundry difficulties which he had experienced, and produced a negative illustrating the points. The next meeting will be held on Thursday, the 29th inst.

FORTHCOMING EXHIBITIONS.

1894.		
November 23–Dec. 1		*Stanley Show (Photographic Section).
,,	27–Dec. 1	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,,	29, 30 ...	Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,,	29–Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytoustone.
December 3, 4.....		North Middlesex Photographic Society.
1895.		
March 25–30		Brixton and Clapham Camera Club.

Those marked * have Open Classes.

News and Notes.

WE understand that an interesting exhibition of the old Polytechnic slides by means of the lanterns used between fifteen and twenty years ago will be given on Monday, 26th inst., by Mr. J. Hay Taylor, at the Lantern Society, 20, Hanover-square, at eight o'clock.

DISSOLUTION OF PARTNERSHIP.—Mr. E. G. Platt writes: "I beg to announce that the well-known firm of Mesrs. Platt & Witte, of Birkbeck-road, Dalston, have mutually dissolved partnership, and that I, Edmund George Platt, have taken over the whole concern, and agree to pay and receive all debts at the same address."

EXHIBITION AT THE IMPERIAL INSTITUTE.—We have received the prospectus of a special Exhibition of photography to be held next year at the Imperial Institute. This we shall publish in full next week. We may mention in the meanwhile that the various Committees and sub-Committees do not appear to be at all representative.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, November 27, at 50, Great Russell-street, at eight p.m. An arrangement devised by Mr. C. E. Hearson for keeping developing solutions at a fixed temperature. A simple apparatus for testing the speed of shutters, with examples. Demonstrations of these will be given by Mr. A. Pringle. Adjourned discussion on Mr. Warnerke's paper, *Chromatic Photography*.

FITCH'S FILM FACTORY.—Quite recently Mr. E. H. Fitch, who, during the last few years, has won a well-deserved reputation for the excellent qualities of his well-known cut films, has found it necessary to seek larger and more convenient manufacturing premises than those he has hitherto occupied at Brixton. The new factory is at Seldon House, Fulwood's-rents, and we recently had an opportunity of inspecting it. A peculiarity of the installation is that it is situated entirely in the basement, and is self-contained, so that

temperature is thus easily maintained at an equable degree. The emulsifying, coating, drying, and packing rooms are all arranged with singular neatness and completeness, facilities being provided for turning out a very large number of films. The latter are coated in strips by hand, the precise method being such as we are not at liberty to make public. In cutting, the films are placed film to film, so that the sensitive layer is not brought into contact with the fingers of the cutter. The cutting machine resembles one such as is used for cards. Unlike most emulsion-making and coating factories, Mr. Fitch's operations are conducted by a very good and agreeable yellow light, notwithstanding the fact that emulsions of the highest sensitiveness are prepared. Among the novelties he has in hand is a stout film for supporting a lantern-slide emulsion. Altogether, having regard to the infinite perfection of detail which characterises Mr. Fitch's manufacturing arrangements, there is no wonder that his "famous flat films" are so good and popular, and that there is every prospect of their being still more sought after in the future.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES.—Eighteenth Meeting of Delegates, held at 50, Great Russell-street, on November 16, 1894, Mr. E. Clifton (Chairman) presiding.—The Chairman explained that he had called the meeting on a night other than the usual night of meeting because, at the three previous meetings, great difficulties had been experienced in getting a quorum. The Secretary reported what had been done in the matters of Rejlander's slides and of the Conference of Judges, and a discussion took place upon the latter. Mr. Marchant (North Middlesex Photographic Society) moved, and Mr. Taylor (Ealing Photographic Society) seconded, "That the resolution that the Committee meet on the second Wednesday in every month be rescinded." This being carried, the meetings will be held from time to time, as occasion may arise, on such dates as the Chairman shall decide. Dr. Turner (Leytonstone Camera Club) moved, Mr. F. A. Bridge (Photographic Club) seconded, and it was carried, "That meetings be held when possible on Friday." With reference to a winter programme, Mr. Huddy (Richmond Camera Club) moved, Mr. Thomas (Brixton and Clapham Camera Club) seconded, and it was carried, "That a Committee be appointed to consider the question of subject, &c.," and Mr. Bridge, Mr. Gregor Grant, and Mr. Mackie were appointed the Committee. A discussion took place upon the provision of lectures, &c., for affiliated Societies, and upon the arrangements for sending out the *Journal*, and it was decided that the delegates should be requested before the next meeting to ask their Societies for suggestions as to the steps they would wish the Affiliation to take to further the ends for which the Societies were instituted.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A RESUSCITATED CARBON PROCESS.

To the EDITOR.

SIR,—The leader in your current issue upon *A Resuscitated Carbon Process* somewhat surprises me, inasmuch as it represents me as being unwittingly the means of promulgating a process or thing as new when, in point of fact, as you endeavour to show, it merely happens to be a novelty to me. You then state that the Artigue method of coating and developing a carbon paper was "in existence a quarter of a century before," about the year 1884. Surely, sir, if my information concerning the history of carbon printing is not at fault, there is some confusion here between the early methods of Poitevin and Pouncy and that now perfected by Artigue. You rightly remark that the former processes do not give the delicate half-tone and fine detail which photographers of the early days, as a body, required in their prints; but herein lies the difference between their paper and that of Monsieur Artigue, inasmuch as the latter is capable of producing the finest and most extended gradation of tone, equal, and, in my opinion, surpassing, that of any other carbon paper of the present day. Further than this, it is an absolute novelty, because, as I stated in my lecture, until at least 1884, and practically in this country up to the present day, it has been held that no such prints could be produced without transfer, or without "attacking the film from the back of the coating."

I should be glad to be informed of any mention prior to, say, 1884 (I don't mind throwing in even a few years later) of carbon development from the front without transfer capable of such fine results as the specimens which I showed at my lecture. That I am made to say that Pouncy's process was first published in 1869 is an obvious misprint for 1859, for which I am not responsible, and it in no way affects the question, for I do not (as you seem to imagine) present the reintroduced processes of Poitevin, Pouncy, and others as novelties, whereas I do that of Monsieur Artigue, not only as a new process, but as an entirely successful one. It is hardly fair, I think, that you should twice lay so much stress on the point that my demonstration at the Salon should not have shown better results. I never pretended that under such conditions I desired to do more than I did.

With the very fine specimens which were shown on the walls, further illustration, except for the purpose of demonstrating the method of working, would have been superfluous. It has been said that the examples by Monsieur Artigue himself which I exhibited were *tours de force*, singular of their kind, and not easily to be equalled by ordinary workers. This is by no means the case. Others equally fine, from a technical point of view, were exhibited, which were the work of an amateur of ordinary experience. Notwithstanding some difficulties in obtaining the paper, the process is not infrequently worked on the Continent, and, with ordinary care, is simplicity itself.

Your concluding statement, that the method of working without transfer is capable of producing *fairly passable* results, is hardly, I think, fair appreciation of such a process. I believe I may refer both to Captain Abney and to Mr. Pringle, who were shown these examples, for confirmation of the opinion that a far more laudatory valuation is no more than they are justly entitled to. The whole question entirely hangs upon the point whether or no we have hitherto been taught to consider that, if carbon pictures are "to be developed at all, this can only be *successfully* accomplished by attacking the film on the opposite side." We have, in the Artigue examples, prints of the highest excellence *successfully* made *by development from the front*, and, in the face of contrary teaching, still promulgated in all our text-books, it is surely reasonable to claim for this process the merit of novelty.—I am, yours, &c.,

Dorking, November 19, 1894. ALFRED MASKELL.

ALGIERS AS A WINTER RESIDENCE.

To the EDITOR.

SIR,—In spite of these days of rapid locomotion, one can scarcely believe that, in a fifty hours' journey from the great metropolis, you may reach a country where it seldom rains and fog is unknown, and is generally in brilliant sunshine. I have been here a month without seeing a drop of rain (there has been none since March), yet the palms, cactus, and olives are beautifully green; they get moisture somehow. I do not detect any heavy dew falls. What a climate for photography at present, a little too warm for my temperament! The thermometer registers from 70° to 84° Fahr. in the shade. I am told this is an exceptionally warm season. The real season does not commence until December, judging from the numerous splendid hotels, pensions, and villas, well patronised by English and Americans. I expect to have a jolly time. The tariff is reasonable. Visitors can have excellent accommodation for ten francs a day; some hotels include wines at that rate. Carriage driving is moderate also; a carriage to hold five persons is three francs an hour, and omnibuses run to all parts at a few centimes a journey.

There is a good English club open from November 1 until May 31, an English church, also a Scotch one (very prettily designed, and built to the memory of Sir Peter Coates) is open during the season. I have had no difficulty in photographing the interior of the mosques, the only penalty was the removal of my boots previous to entering. The Arabs evidently believe that "cleanliness is next to godliness," for, in a square adjoining the mosque, they are to be seen washing their feet and heads, gargling their mouths, and squirting the water through the nostrils, most of them look as if they only washed themselves once in a lifetime, or, at least, attended the mosque very seldom. Photographers can find plenty of studies here, but the cameras must be of a non-detective character. The Arabs are terribly afraid of cameras, and run as if a detective was after them; they have a strange belief that, if they are duplicated, a soul must be found for each duplicate, and they carry their belief even to paintings. A missionary told me that an Arab had once painted a fish, and that his brethren were in a quandary as to where the soul was to come from. I suggested that probably the fish was a sole (soul). I notice many professional photographers here, and most of them make a speciality of photogravure, and a good business seems to be done in that way. The hotel menus are all illustrated by photogravures. The best work is done by a Swiss, Jean Geiser, a Paris Exhibition medallist. I have a good dark room adjoining the hotel, size 20×9 feet and about 14 feet high. At my request, the manager has had a constant water supply laid on. I hope to have my lectures finished by the time I return to England. I will be pleased to give my photographic friends a show of slides and other hints.—I am, yours, &c.,

A. L. HENDERSON.

Hôtel St. George, Mustapha Supérieur, Algiers, North Africa, November 13, 1894.

MR. HORSLEY HINTON.

To the EDITOR.

SIR,—At the Exhibition of the Royal Photographic Society this year the Judges did me the honour to award me a medal.

At the meeting of the Society on the 13th inst. the members paid me the further honour and distinction of "black balling" me alone out of fifty-six candidates for membership—the first instance of the kind for many years, if not actually without precedent.

I venture to express my belief that this action will do the Society more harm than me, and as there may be others who, like myself, are not afraid of comparing their work, and are justified in feeling themselves

not socially obnoxious, who may be glad to know that apparently some other qualification than merit and good character are necessary for membership at the Royal Photographic Society, I am sending a copy of this letter to all photographic papers, and shall esteem it a favour if you will insert it.—I am, yours, &c., A. HORSLEY HINTON.

London, November 19, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange four-wick lamp for quarter-time and instantaneous shutter.—Address, W. DAVIS, 63, Garden-street, York.

Wanted interior background; will exchange for same, one porcelain dish, 26×22. Address, A. HILL, Photographer, Bradford, Wilts.

Wanted, rolling machine or burnisher, suitable for gelatine prints, in exchange for Marion's five-guinea embossing press and dies.—Address, W. WALKER, Scotholme, Nottingham.

Wanted, a portrait lens, three and a half inches diameter, in exchange for any of the following: No. 7 portable symmetrical, 3D Ross's rectilinear, Darlot's 10×8 hemispherical; all new.—Address, J. LISTER, Police-street, Darwen, Lancashire.

A single limelight lantern, with removable leather extending front, two mixed jets four cylinders, two Beard's regulators, and fifteen-feet screen, all new last season, exchange for Hume's enlarging apparatus, with ten-inch condenser.—Address, J. T. NEWMAN, Berkhamsted.

Will exchange Dallmeyer's 10×8 patent rapid rectilinear, with set of stops good as new, and mahogany 10×8 camera, 1894 pattern, hardly used, for studio, 10×10 camera and stand, and good cabinet or whole-plate lens.—Address, GEORGE E. STONE, Photographer, Swindon.

Will exchange Hunter & Sands burnisher (new), eight-inch bar. Kershaw's 12×10 shutter, time and instantaneous, half-plate rapid rectilinear lens, ditto portrait, ditto wide angle: Wanted light backgrounds, interior or exterior, or studio accessories.—Address, ROBINSON, Mumbles.

Stephenson's binocular microscope, by Swift, with two-inch, one-inch, and half-inch objectives, by Crouch, Webster's condensers, with iris diaphragm, two live boxes, &c.; will exchange for first-class hand camera taking plates, in perfect order.—Address, J. ELLIOTT, 4, The Beacon, Exmouth.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to "*THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," *2, York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., *2, York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

A. L. H.—Received.

PHOTOGRAPHERS' COPYRIGHT UNION.—In our next.

W. A. DUNCAN.—Mr. Bridge's address is East Lodge, Dalston-lane, London.

ERNEST A. SWEETMAN.—There is no advantage in using collodion to aid in the transferring.

URANUS.—The largest of the portrait combinations mentioned will answer well for stellar photography.

B. T.—Evidently the washing was imperfect at the first stages. The only remedy we can suggest is to take a fresh negative.

A. A. B.—If the plate is to be etched for intaglio printing a grain will be required, but if for relief printing a grain is not necessary.

G. E. ARNOLD.—The proceedings are characteristic of the firm's method of doing business. Communicate with the local superintendent of police.

W. N. (Cranbrook).—Better address Mr. V. C. Driffield, Appleton, Widnes, who will, we are sure, be pleased to give you the information. Sorry we cannot.

A. B C.—The cash value of these lenses is now very little. Many by that maker were excellent productions. The firm has been extinct for nearly thirty-five years.

R. BRUCE.—We must decline the instituting of a comparison between the works of these various opticians; but we may observe that the two classes of lens by home makers are practically similar.

J. GERRARD.—See Mr. Ponton's article on *Photography without an Objective*, in the JOURNAL for May 19, 1893; also *Pinhole Photography*, by J. F. Brandt, in the number for December 30, 1892.

R. COE.—If you had consulted the advertisement columns, you would have seen that several firms are supplying special mounts for Christmas-card portraits. They are a regular article of commerce with most of the large dealers.

F. G. MASON writes: "Kindly give me the correct strength for the gelatine and chrome alum for transfer of carbon prints on to ivory."—A good proportion is, gelatine, one ounce; water, a pint; chrome alum in one ounce of water from twelve to twenty grains, according to the kind of gelatine used.

P. M. B.—Simple lenses of the kind mentioned are sold by every dealer in spectacle maker's requisites. There are any number of these in the vicinity of Hatton-garden, London. You can ascertain the focus of a negative lens by placing a positive one in contact, and looking through them. When the result ceases either to magnify or diminish, the focus of the positive lens equals that of the negative. The lens mentioned will probably be twenty years' old.

H. S.—There are no recognised makers of that kind of machinery. The firms that use it have it made to their designs according to the particular purpose for which they require it. A little consideration will show that what is required for coating paper with one material will not suit for coating it with another. What is more, the makers of similar papers do not always use the same kind of machines, nor do they publish anything about their construction. Better design a machine that will answer your requirements, and get a local engineer to construct it for you.

A. Z. says: "I see you refer in last week's JOURNAL to sulphate of baryta as used in making gelatine enamel paper. Could you inform me how the salt is used, and what part it plays in the formation of the enamel film? also if it would be of use in making a highly glazed albumen film? I am experimentalisiug in the preparation of different papers, and if you can give me this information I shall be much obliged."—Sulphate of baryta is simply the pigment with which the paper is coated, mixed with size or similar material. The "enamelled" papers, prepared for lithography or collotype work, are usually surfaced with sulphate of baryta as the pigment. It is easy to prove if such papers will answer the purpose desired.

COPYRIGHT.—You will see the matter dealt with in another column, also the report of a case that was decided in the law courts last week. If you are paid for taking the portrait by the sitter, why should he not have the right to do as he likes with the picture? Why should he not have it enlarged by another photographer if he chooses? He has paid you for your work. In expending a great deal of work on the negative, and only charging a small—ridiculously small—price for the first print, in the hope that further copies will be ordered, you must be prepared to take the risk, whether they will or whether they will not be. Any how, any proceedings that you may take, either against the enlarger or the sitter, will be decided in their favour.

H. W. B. writes: "1. What is the most exhaustive and practical treatise on carbon printing, a book from which I am likely to obtain all necessary information for working the process? 2. I have two old wet-plate negatives left me by a client to be backed and framed as positives. Should they be backed on glass side or film side? I notice they show most detail with film side uppermost when holding against anything black. Would Bates's black do for the purpose? In framing, would it be best to frame close up to the glass, or can you suggest any mount that would be likely to assist in brightening the result, and act as a set-off for the picture? The negatives as they are do not appear very brilliant by reflected light. 3. How can I recover gold in metallic state from precipitate of old toning bath?"—In reply: 1. The *Autotype Manual*. 2. Bates's black will do very well, and the best effect will be got by putting it on the back. Negatives, of course, if good, cannot be made to look well by reflected light. A dark frame or mount will probably suit best. 3. The gold, if precipitated in the usual way, with iron, is already in the metallic state. It may be melted in the furnace, when it forms a solid lump, alloyed with silver.

*** We have in type articles by Hector Maclean, F.G.S., Henry E. Davis, Hugh Brebner, G. R. Baker, J. Vincent Elsden, and others. These and many other interesting communications we shall overtake at the earliest opportunity.

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THE BRITISH
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UNIFORMITY IN THE WARMING OF CHEMICALS.

Following up the ideas enunciated last week, and without the slightest intention of anticipating, or discounting, what may be said by Mr. Andrew Pringle on the subject of an application of an apparatus by Mr. Hearson for keeping solutions at a definite temperature, we think it may interest many to describe a very ingenious means of keeping the temperature of the interior of a small chamber at any determined degree of warmth, which was devised nearly fourteen years ago by Mr. C. E. Hearson. This gentleman applied his invention to fowls' eggs, which, as every one knows, must, for incubation, be kept at a definite temperature for three weeks.

The principle of the actuating portion of the instrument is this: The vapour resulting from heating any fluid occupies vastly more space than when such was in a fluid condition. Although water requires a temperature of 212° Fahr. to boil it, alcohol will boil at 173° Fahr., and sulphuric ether at a much lower temperature, viz., 94°. A small quantity of ether is enclosed in a capsule made of very thin brass, soldered around the edges. The one we have used is over one and a half inch square and lies quite flat. On applying heat up to 94°, nothing takes place; but, when this temperature is exceeded, then does the engendered vapour cause the side to bulge out, to be succeeded by flattening again when the temperature falls below its boiling point, for the vapour being confined cannot escape, and therefore becomes condensed.

This, simple although it be, is the whole principle of the Hearson system of regulating temperature. Let us now explain how, having this power compressed in a form not greatly exceeding some postage stamps, the inventor has applied it for thermostatic purposes; and we will draw on his presumably well-known incubator for our illustration. This ether capsule is laid upon a shelf, or is supported by any other means, in what we may designate a cupboard or box, the top of which is composed of a closed water tank. Outside of this, and at one end, is a lamp of the ordinary paraffin kind for country use, or gas where it is available. A straight chimney conducts the heat away clear outside, or it would do so were there not another power intervening.

About half way up this chimney, which is formed of a metallic tube, is an opening at one side, in which a similar tube is inserted, this one going off in a horizontal direction, and passing through the midst of the water in the covering tank, thence to the outside. Hence, if a cap were placed upon the top of the vertical or direct chimney shaft, the heat would pass through the horizontal one, warming the water in its transit. We now explain the function of the little flat ether capsule, and in what manner it acts as a thermostat.

A rigid wire is made to rest its end upon the top of the capsule. This wire passes up a tube through the water tank, and projects above. A light lever, hinged at one end, rests upon the upper end of the stiff wire, not far from its hinge or fulcrum, and a flat disc, which acts as a cap to the top of the vertical chimney, is suspended from the free end of the lever. Now let us suppose that a temperature of 100° is desired in the interior of the cupboard; the whole of the heat from the lamp, passing through the water by the horizontal flue, raises the heat inside until the ether boiling point of 94° is attained, when the ether would vapourise and swell out the capsule, and, through the agency of the stiff wire, would raise the lever, and thus uncap the vertical flue, causing, in turn, the heat to escape without travelling through the water. But a small and adjustable weight of lead is placed upon the lever, and exerts such a degree of pressure upon the capsule as to withstand the earlier efforts of the ether to vapourise until a temperature of 100° has been attained in the interior, when the lever is raised and an increase of temperature prevented.

When, by the withdrawal of the source of heat from the water, the interior temperature comes to fall by only one degree, the capsule collapses, and simultaneously the lever descends and caps the chimney, and this goes on automatically for weeks, so long as there is a supply of gas or one lamp is substituted for another to keep up the heat supply.

For photographic purposes, and when a higher temperature is desired for the interior of a chamber in which to keep the various chemical solutions, any temperature within great limits may be got by sliding out the adjustable lead weight nearer to the end of the lever; or, for that matter, a still greater degree of heat may be had by the substitution of a capsule containing bisulphide of carbon, which boils at 118°; methylic alcohol (wood spirit), at 149°; or alcohol, at 173°.

The point to be noticed is that, when once the adjustment has been made, it is constant, and the temperature is automatically regulated for ever afterwards. Mr. Hearson is entitled to much credit for having solved the problem of ensuring a uniform rate of temperature. His invention has been mainly confined to the hatching of fowls' eggs, which require a heat of 103°–104°, but the principle is capable of extension in numerous other directions, even to keeping a young baby warm in its

cot, which, we learn from Mr. Hearson's *Problem Solved*, has actually been done.

As the patent is still in force, and will be so for several months yet, no one thinking of using such a capsule will, of course, do so without permission. The claim of special interest to experimentalists forms the last of the list of claims in the original patent, and embodies the use of an hermetically sealed expansible and collapsible case or capsule containing a liquid as a motor for mechanism, which is required to act at certain temperatures, the liquid in the said case or capsule being such as will boil or condense at the temperature at which the said mechanism is required to act.

By the way, ought not a chamber heated and retained at an absolutely unvarying temperature be useful in conducting nice experiments in the making of gelatine emulsions?

DIRECT CARBON PRINTING.

When dealing, a fortnight ago, with "a resuscitated carbon process," we mentioned that some of the early experimentalists in pigment printing, before the transfer method of working was introduced, were able to produce some fairly passable results; we then had in our mind several that were produced by the late Mr. Pouncy, which might well be classed as something beyond that. We also well remember some of that gentleman's work that was shown at one of Mr. Bolas's Cantor Lectures fifteen or sixteen years back, the property of the late Mr. Le Neve Foster, and lent for the occasion, that were really good. In the article referred to we intimated that on some future occasion we might say something about the conditions of working under this system by which the most favourable results might be secured. For the benefit of such experimentalists as may feel inclined to give it a trial, we again revert to the topic.

If we first consider the principles of carbon printing as universally worked, the subject will be the better understood by the novice. The tissue now used is merely paper coated with a pigmented colloid body—gelatine, rendered sensitive to light by bichromate of potash, the coating being a somewhat thick one. After printing, a certain portion of this coating is insoluble in warm water, while other portions which the light has not reached still retain their solubility. If an ordinary carbon print as it is taken from the frame be immersed in warm water, the image will float off the paper in detached pieces; hence the picture, before development, has to be attached either to a temporary or a permanent support. Then, when the print is put into the warm water, the gelatine next the paper, which the light's action has not reached, dissolves and leaves the image attached to the support, which is then fully developed by the further application of warm water, and, in the end, a picture is obtained in varying thicknesses of pigmented gelatine; hence the most perfect gradation in tones is secured.

Now, a little consideration will show that, if the picture is to be developed upon the paper on which is the pigmented colloid body, whatever it may be, this soluble layer must be avoided, otherwise the delicate tints will not be secured. Hence it will at once be manifest that the commercial carbon tissue will not answer the purpose. What is required is a very attenuated layer of the colloid matter, which must be firmly attached to the paper, indeed may be said to be in its surface rather than upon it; also that the body should be proportionately much more highly charged with pigment than is the case with ordinary carbon tissue, otherwise the finished pictures would be lacking in vigour, as thickness in film is a condition to be avoided.

Beaurégard, one of the first in carbon printing, worked in this way in 1857. He coated paper with a solution of gelatine containing a bichromate, and dried it. He then covered the surface with pigment, and rubbed it in with a pad of leather; or, as an alternative, the paper was immersed in a bath of Indian ink or other pigment, ground up with water, and mixed with gelatine or gum, and used warm. Pouncy, later on, mixed the pigment with a solution of gum acacia and bichromate, and applied that to the paper, and, after allowing it to soak in for a couple of minutes or so, it was brushed off as closely as possible with a hog's-hair brush. Here it will be seen that the pigmented coating was to some extent in the paper as well as upon the surface, consequently the conditions towards success were secured.

At one of the meetings of the French Photographic Society in 1859, M. Brebisson described his method of carbon printing without transfer, which had this novelty about it, namely, that the pigment was not applied until after the picture was printed, and it had the further advantage that, unlike carbon printing of the present day, the image was a visible one, and could be watched while printing. The method was this: Paper was floated successively on a weak, warm solution of gelatine and one of bichromate of potash, and afterwards dried. It was then exposed behind the negative until the shadows were somewhat strongly rendered. The pigment was then applied as a fine powder, and well stumped in. When an even coating was obtained the print was treated with hot water and the image developed, a brush being used to facilitate the operation and modify it by local treatment as desired. In each of these methods it was essential that only a thin layer of colloid matter was employed. Having described some of the methods by which fair prints were obtained, and indicated the conditions under which the more favourable results are obtainable, the experimentalist will see in what direction to work.

One thing, in any direct printing method that may be tried, is essential, which is that the pigment coating should not only be thin, but that it should be perfectly uniform, an end not easily attained by the novice. However, with a little experience, an even coating may be obtained if, instead of applying the pigmented gelatine, supposing gelatine to be used in a fluid condition, it is allowed to cool, and, when in the jellied condition, well broken up, and then applied with a brush after the manner of distempering. Or the paper may be coated with a thin solution of gum or gelatine, and, while still wet, the pigment spread over it, and the surplus removed when dry. Other methods will naturally suggest themselves when the necessary conditions are recognised.

Whatever method may be adopted, a little consideration will show that a great advantage will accrue from sensitising the paper from the back, as then the colloid body next the paper and in it, will, under ordinary conditions, be less soluble than that on the outer side, and for this reason the half-tones will the better be retained.

If there were a prospect of these old non-transfer processes again receiving attention, it would not be amiss to refer to another, and one by which better results than by the others can be more easily obtained. Blair, Burnett, and others in the early days spread the pigmented gelatine on translucent

material, or on thin paper, and printed through from the back. Then, when the print was developed, all the delicate half-tones of a carbon print were obtained in perfection, without the necessity of transfer. One of the objections to this method was that the printing was slow with the dense negatives of that period. Another, and a more serious one, was that the fibre of the paper showed in the prints, and somewhat marred the finest detail—a thing which, at that time, would not be tolerated. The case is different now, at least with those of the impressionistic school. By them this, at one time a defect, may now be considered an acquisition rather than otherwise.

SPOTS ON PRINTS AFTER FIXING.

In our correspondence column this week appears a letter which formulates a very common complaint amongst our modern readers, and though the trouble is one that will, perhaps, be lightly explained away by many of the old hands, who may chance to read of it, it is sufficiently annoying in many cases where only the adoption of elaborate precautions suffices to meet the case.

In most large towns where there is a properly organized system of water supply, the danger of spots arising from impurities in the water itself is much less than in the case of our correspondent, owing to the care exercised by the authorities in, at any rate, partially filtering and purifying the supply. Under such circumstances, the risk is chiefly confined to dirty pipes and fittings, or, what amounts to the same thing, to carelessness on the part of the operator; but, where the water is drawn directly from a well without any purification or filtration whatever, the case is very different, and, in many cases, the water supply so obtained is utterly unfit for use in photography, without at least some attempt to deprive it of its impurities. Upon the nature of those impurities, and the particular purposes to which the water is to be applied, will, of course, depend whether it is fit for use or not; for instance, a sample that would pass muster for washing prints might be utterly unfit for emulsion-making, or for any purpose in which soluble silver salts are employed.

In our correspondent's case, we think it is pretty clear that it is the water that is in fault, though what may be the particular impurity that causes the spots it is impossible to decide without having more accurate data to go upon. We may premise, however, that the experiments he quotes in attempting to produce the spots "artificially" are by no means conclusive that the water is not in fault, or, rather, that the substances used as the inducing agents would not under other circumstances produce a different result.

A "spoilt print"—by which we infer the writer means a toned, fixed, and washed print—soaked in "clean hypo" is not by any means a fair or accurate representative of a print in the act of fixation. In the former case, the gold-toned image is subjected to the posssible effect of the action of the iron or lead salts upon plain sodium hyposulphite, while, in the latter, we have the addition of the soluble hyposulphites of silver in process of formation. Without for a moment contending that in the first instance the combination would be quite harmless, we may with perfect safety say that in the other it would be, in the case of some of the agents named, in the highest degree dangerous. In fact, in our correspondent's experiments he has altogether omitted the very important element present in the fixing of prints, namely, soluble silver salts.

From the description of the spots, there cannot be the slightest room for doubting that the result is due to sulphuration, and that this is caused by decomposition of the hyposulphites by solid particles of some impurity contained either in the water or in the paper or film itself. The former is the more likely, as too much care is exercised in the preparation of commercial papers to admit of so bad a sample being persistently put upon the market. That the impurity is in the solid form—*i.e.*, in a state of suspension—is clear from the fact of the trouble appearing in the shape of spots, for, if it were in solution, the result would be general discolouration or yellowing of the prints.

Confining ourselves, in the first instance, to the water as it proceeds from the pump, let us see what possible impurities we have to deal with. Besides the usual soluble salts present in hard water, which we may pass over, the only other substances of a mineral character that are likely to be present in any quantity are sulphate and carbonate of lime. But, in the case of a particularly foul well, there may be all sorts of decaying organic matter, which, if in the soluble condition, may also be passed over for the reason already stated. Finally, we may look at the chances that exist of solid impurities coming from the pump itself, which may consist of accumulated organic matter from the water itself, or possibly lead from the pipes and oxide of iron from the piston and valves. The lead, if present, would be undoubtedly in the form of sulphate produced by the action of the soluble sulphates in the water.

Taking these impurities in the order named, we may at once dismiss the lime salts from this indictment, as these, being perfectly soluble in sodium hyposulphite, would not produce spots if they exercised any deleterious action at all, which is scarcely likely. If we turn to the organic impurities, it is where we are more likely to find danger, though the greater part of these are more likely to be in the soluble condition, especially the ammonia and sulphur compounds derived from sewage matter; but solid particles, in an extremely fine state of division, of partially decomposed vegetable and other matter, frequently form no inconsiderable item in the impurities of well water; indeed, in country places, it is impossible to set a limit to what may be obtained from the pump. Some three or four summers ago, when down in the country, a jug of water, drawn for drinking purposes, was found to contain a particularly lively newt, and if the well contained *live* ones, why not dead and decomposing ones? The effect of particles of such matter in conjunction with soluble hyposulphite of silver may be readily imagined, and would fairly account for any spots that might appear.

In the case of lead or iron compounds abraded from the internal portions of the pump, though less likely to occur than any of the other impurities mentioned, their action cannot be expected in any case to be beneficial. Sulphate of lead, the form in which that metal is most likely to present itself, is, like the lime salts, soluble in hypo, but, unlike those, it cannot be said in dissolving to pass into an innocuous condition. Rather, is it likely to enter into combination with the soluble silver salts formed in fixing, and to deposit sulphide of silver as well as of lead on the prints, though these would, we imagine, form dark spots, whereas those usually complained of in this connexion are faded spots formed at the expense of the silver image itself, and caused by something decomposing in contact with the print.

Such, at least, would probably be the action in the fixing

bath itself, but, after the removal of the prints from the hypo, the very conditions last mentioned would be set up if they were passed into water containing suspended lead salts. The particles settling on the prints would suffer decomposition in contact with the image, and thus in all probability produce the very result complained of.

Iron rust derived from the piston-rod of the pump, or more probably, in the case of hot water, spoken of by our correspondent, from the interior of the boiler itself, might be expected to act in a somewhat similar manner in the presence of the soluble silver hyposulphite, though not with plain hypo. At any rate, hot water from such a source is to be avoided for all photographic purposes, since the heat of an ordinary kitchen boiler is not usually sufficient to deposit a thick and safe "fur" on the sides, and, if it does at the lower portion, the top, from being generally uncovered, will have a coat of rust that is being constantly washed down each time the boiler is refilled. Consequently water from that source may always be suspected of being contaminated with iron. A kettle, or other vessel, in which water is constantly *boiled*, is much safer.

We may infer, then, that spots are only caused by insoluble particles of matter that are capable of setting up decomposition of the hypo, and so liberating sulphur, either in the soluble or insoluble form. Anything of an acid nature, even if otherwise harmless, will produce this effect, particles of alum, for instance. In the old days, it was the custom to render the fixing bath alkaline, in order to counteract any tendency to acidity, and such a practice is worthy of recommendation at the present time, where no other means are available.

But a far better plan is that recommended by some operators in connexion with gelatino-chloride paper, of using a mixture of sodium hyposulphite and sulphite for the fixing bath. This is usually said to preserve the whites of the print, which no doubt it does; but it also does far more. Sulphite of soda is a solvent, not only of sulphur, but also of many of the sulphides and hydrosulphuric acid, and with these substances forms hyposulphite. If, as all know, an acid is added to a plain solution of hypo, a copious precipitate of sulphur is thrown down, and sulphuretted hydrogen and sulphurous acid given off. If, however, the same addition be made to the mixed solution of hypo and sulphite, no precipitate is formed, and no gas is given off, until the whole of the sulphite has been converted into hyposulphite.

Similarly, for the prevention of spots, it is advisable to employ the mixed bath, as then, should any deleterious particles gain access to the surface of the prints, the sulphite present will play its part by combining with the sulphur liberated from the hyposulphite, whether of soda or silver, and so at any rate render the risk of spotting more remote.

A Remarkable Phenomenon of the Adhesion of Aluminium and some other Metals to Glass.—According to the *Chemical News*, M. Ch. Margot has observed that aluminium has a great power of adhesion to glass, so that designs can be made upon moist glass with an aluminium pencil which cannot be removed with any mechanical agency. If the metallic aluminium is dissolved away with acids, the design remains visible like an etching, hence M. Margot concludes that the metal has a chemical action upon the basic silicate. Certain natural silicates behave like glass; quartz, emerald, topaz, and corundum behave like silicates, whilst there was no action upon diamond. Magnesium acts like aluminium, cadmium rather more slightly, and zinc still more feebly.

A Loan Collection of English Photographs for India.—For the forthcoming Exhibition of the Photographic Society of India, Mr. R. Child Bayley is organizing a loan collection of English work. We have seen most of the examples sent in, and are pleased to feel that, on the whole, the collection will be a good and representative one. The following are already represented:—Dr. P. H. Emerson, Colonel Gale, Messrs. J. H. Anderson, J. H. Avery, A. Burchett, W. A. Cadby, Clutterbuck, Donkin, A. R. Dresser, Frechon, J. M. C. Grove, A. J. Golding, Horsley Hinton, B. Lintott, J. C. S. Mummery, Kidson Taylor, W. Thomas, W. M. Warneuke, B. Gay Wilkinson, and H. Yeo. Saturday next, December 1, is the latest date on which Mr. Bayley can receive exhibits, which should be sent to him at 50, Great Russell-street, W.C.

Photographic Exhibition at the Imperial Institute.—Introductory to the Exhibition of Photography to be held at the Imperial Institute next summer, the following lectures will be delivered:—*The Eye and Photography*, by Captain W. de W. Abney, C.B., D.C.L., F.R.S., President of the Camera Club; *Photography in its Application to Astronomy*, by Captain E. R. Hills, R.E.; *Photography in its Application to Art Reproduction*, by Sir H. Trueman Wood, President of the Royal Photographic Society; *Photography in its Application to Ethnology*, by Mr. H. H. Johnston; *Photography as an Instantaneous Recorder*, by Mr. Lyonel Clark, C.E. We remarked last week that the Committee managing the affair does not seem at all representative. There is, in fact, too much of a mixture of South Kensington, plus the officers of the Camera Club and the Royal Photographic Society, about it. We hope the sub-committees, at any rate, may be strengthened by the addition of some professional photographers; and those who are practically concerned in photography as an industry, as well as in its various industrial applications. We should have preferred to have seen the Royal Photographic Society officially invited to nominate some representative men for the purpose.

Dermatosis caused by Metol.—Mr. V. A. L. E. Corbould, M.R.C.S., of 50, Victoria-road, Kensington, W., writes: "Doubtless among the many workers who use metol there are a few who have discovered that it has, as well as many advantages, at least this one drawback, namely, the production of a red eruption round the bases of the finger nails which have been immersed in its solution. The eruption, as I have encountered it, varies considerably with different people, being, however, usually characterised by slightly elevated patches two or three lines in length and about a line in width, arranged round the root of the nail of the thumb and first finger; they are usually hard to the touch, and occasionally one or more become converted into blisters containing clear serous fluid. At first these patches itch, and are constantly tingling; at other times they are anæsthetic from the first. These signs were quite absent in one case I saw, but an itching punctiform rash appeared on the right fore arm, the fingers showed no signs of local irritation; this eruption appeared and disappeared simultaneously with the use and disuse of metol. I may mention that I have found it worse when metol is used in conjunction with pot. carb., and is not nearly so noticeable when ammonia is used as an alkali. The bad effects usually pass off in twenty-four to forty-eight hours, but show a tendency to reappear on subsequent use of metol. Being rather interested in this subject, I should feel obliged if any other people suffering from this or similar affections, traceable to this substance, would kindly send me by post their experiences."

South London Photographic Society.—On Saturday evening, December 1, at the Exhibition, a testimonial will be presented to the President of the Society (Mr. F. W. Edwards), on behalf of the members, as a mark of appreciation of the services he has rendered to the Society.

PLATINO-CHLORIDES AND PLATINUM SUBCHLORIDE.

[American Journal of Science.]

THE methods now in use for obtaining potassium platino-chloride are: 1. Heating platinic chloride to 250–300° C., and treating with potassium chloride. 2. Passing sulphurous acid through a boiling solution of platinic chloride and treating with potassium chloride. To these older methods Thomsen has added: 3. Treatment of potassium platini-chloride with cuprous chloride.

All these have objections. With (1) it is not easy to obtain a uniform conversion, (2) requires to be very closely watched to catch the exact moment at which the change is complete, (3) is liable to a vexatious reverse action by which platinous salt is reconverted into platinic salt at the expense of the cupric chloride present. Thomsen mentions this danger as occurring in hot solutions. It probably depends, however, more on concentration than on temperature. The larger the proportion of cupric chloride present in any solution, the greater the tendency to reversal. In one case a half litre of mother water containing platinous salt was set aside for spontaneous evaporation. In a few days large crystals of the red salt began to form; in a few days more, instead of these increasing, there was not a crystal of the platinous salt left.

These objections led me to look for something different. I have found two methods, either of which gives good results.

First Method. Potassium Acid Sulphite.

Potassium platinic chloride is to be moderately heated with solution of the acid sulphite. Convenient proportions are—

Platinum salt	12 grammes.
Acid sulphite	9 „
Water	160 c.c.

The mixture can be placed over a hot-water bath in a covered vessel and left to itself. The reduction takes about ten to twelve hours, and is known to be complete when the solution has a pure red colour free from yellow. The cover is then removed, and the liquid evaporated to the crystallising point.

If, as may happen, the red chloride and the other salts crystallise out together, it is best to redissolve them by heat in a small quantity of water saturated with potassium chloride. The red salt then crystallises out first.

Second Method. Alkaline Hypophosphites.

By reason of its great reducing powers, a very small proportion of alkaline hypophosphite is capable of converting the yellow platinum salt to the red; theoretically, one part of hypophosphite should reduce nine or ten parts of platinum salt. We can hasten the operation somewhat by using an excesss of hypophosphite, but then must work at a lower temperature. Both methods will be given.

In using an excess of hypophosphite it is convenient to take 10 grammes of platinum salt, 2 grammes or even more of potassium hypophosphite, and 600 c.c. of water. These are placed in a flask and very gently heated. The best temperature is 66° to 70° C.

There is a very easy way of obtaining this temperature and of keeping it perfectly constant for any length of time by taking an ordinary water stove of the kind in which a chamber is surrounded on five sides by water. Such a stove is to be furnished with a Kekulé constant level, regulated to keep the water jacket half full. If, now, the heat is turned on so as to keep the water gently boiling, it will be found that solutions placed *on the top* maintain a perfectly steady temperature, varying from 55° to 72° C., according to the shape of the vessel, but constant for any one shape. The lowest temperature, about 55°, is obtained with an open, flat porcelain basin. It rises gradually as the shape of the vessel tends more to check evaporation. When a litre flask has about two inches of solution, the temperature will remain steady at about 66°, and this temperature is very suitable for the treatment just described.

Even with this excess of reducing agent, ten or twelve hours will be required. The solution must not be allowed to evaporate to less than one-half its original bulk.

The completion of the operation is known by the solution showing a perfectly pure ruby red colour. The slightest shade of orange indicates the presence of the yellow platinic salt. It is much safer to allow the solution to evaporate spontaneously. If evaporated by heat, there is always a chance that the reduction may go too far.

There is not much to choose between these two methods. The first, with acide sulphite, is the safest, because there is no danger of carrying it too far. On the other hand, in the second method, the red salt separates more easily and completely in crystallising.

On the whole, the method which I prefer is to keep down the hypophosphite, and use a higher temperature and longer heating. For this, a weighed quantity of platinum salt may be placed in a flask with 30 c.c. of water for each gramme of the salt, and a quantity of potassium hypophosphite equal in weight to one-ninth of the platinum salt. The flask is to be placed in a water bath which is kept at 80° to 90° C. In consequence of the small portion of hypophosphite, the action is slow, requiring about eighteen or twenty hours for complete conversion. No attention during this time is required, and the advantages are that the solution becomes sufficiently concentrated to crystallise on cooling, and that the very small quantity of foreign matter introduced renders it easy to obtain a pure product.

At 100° C. the reduction to red salt takes place in about fifteen minutes. This method is practicable, but requires great circumspection. If the boiling is continued a little too long, the solution suddenly turns brown; the reduction has gone too far.

If a quick reduction is desired, it is better to use an acid sulphite as a reducing agent, and the following method gives satisfactory results. In a flask are placed 300 c.c. of water, twenty-four grammes of potassium platinic chloride, twelve grammes each of potassium acid sulphite and potassium chloride. Sodium acid sulphite should not be used. The introduction of sodium salts interferes with the crystallisation; not, indeed, with the first crop of crystals, but later. These are made to boil rapidly together for twenty-five minutes, reckoned from the time when actual boiling begins. The solution is allowed to cool, filtered if necessary, and placed in a large flat-bottomed glass or porcelain vessel. In a day or two the red salt will commence to form large crystals. The addition of the potassium chloride causes the red salt to crystallise out first.

It has seemed worth while to give these methods in some detail because the red platinum salt is likely to find a constantly increasing use in photography, not only for platinum printing, but as a substitute for gold in toning. There is no doubt that platinum is a much better metal for toning silver prints than gold. Its tones are better, and its action is much more reliable.

By all these methods this beautiful salt is obtained in fine ruby red prisms.

Probable Existence of a Platinum Subchloride.

If, in obtaining potassium platino-chloride with the aid of a hypophosphite in excess, the heat is continued after complete conversion to the red salt, the solution in a few minutes changes from red to dark brown. The substance which gives the solution this dark brown colour exhibits the following properties:—

It is very deliquescent and cannot be crystallised. There is no satisfactory method of separating it from the other substances in solution. An oxide of platinum appears to be precipitated by the addition of potash, and this precipitate when freshly made dissolves easily in hydrochloric acid; but, if it is thrown on a filter and washed, almost the whole of it runs through. This difficulty, it is true, can be avoided by washing with a dilute solution of potassium chloride; but the precipitate after washing is no longer soluble in hydrochloric acid, except that the acid dissolves out a little protoxide derived from the red salt, some of which is apt to escape reduction.

The brown solution exhibits the following reactions:—

Hydrochloric acid has no effect.

Nitric acid decolourises it.

Potash produces a brown precipitate, soluble in an excess of the precipitant.

Ammonia a brown precipitate, insoluble in an excess.

The solution itself is opaque by reason of its intense colour. When largely diluted, it is yellowish brown and perfectly transparent.

From the method of obtaining this substance there seem to be only two possible explanations of its nature. First, that it is metallic platinum in a state of solution; this is decisively negatived by the reactions just described. Second, that it is a chloride containing less chlorine than platinous chloride; therefore a subchloride. If the precipitate obtained by potash could after washing be dissolved in hydrochloric acid, its constitution could easily be determined; but during the washing it seems to be converted into metallic platinum.

I have noticed that when a solution of the ruby red salt $2KCl, PtCl_2$, is spread on paper and exposed to sunlight, it does not blacken but assumes a yellowish brown colour; it would seem, therefore, that light acts upon it in much the same way as a hypophosphite, reducing it probably to a subchloride. If the reduction was to metallic platinum, this would be shown by the production of an intense blackness.

In all this, analogy with silver salts is unmistakable. Pure silver chloride is not reduced to metal by the action of light, for after exposure it yields nothing to nitric acid. Both metals seem to form subchlorides, the oxides corresponding to which are very unstable.

M. CAREY LEA.

IMPRESSIONS OF IMPRESSIONISM.

[London and Provincial Photographic Association.]

This is not a paper on art! The word itself appears herein only once, and that in this, the prefatory paragraph. What I shall endeavour briefly to present to you will be a few reflections on some aspects and tendencies of present-day pictorial photography, and the point of view I shall occupy will be that of a lover and student of photography, without the slightest prejudice in favour of, or against, any particular school, method, or style of pictorial treatment.

An Impressionistic Fever.

There is an impressionistic fever abroad. Impressionism is apparent in our fictional and dramatic literature, in painting and other graphic methods of representation, and had I the time, and you the patience to follow me, I do not think it would be difficult for me to trace its presence in modern manners, in the columns of the newspapers, in music-hall entertainments, in the austere realms of Science, and in many other less suspected places. But it will meet the needs of the present case if I do not step outside the limits I have laid down for myself. Within those limits I, of course, place photography, which also, it is hardly necessary to remind you, has its impressionistic phase.

Some may ask what is meant by impressionism. I prefer not to bind myself to any hard-and-fast definition, but to explain the term, as it is commonly understood, by one or two simple illustrations. Thus, in stage literature, Ibsen, the Norwegian writer, has created for us a world of beings, supposed to be ordinary or average persons, who do and say things which are not discoverably done or said in actual life. His men and women pair and unpair on the most insufficient grounds; they commit suicide and other mistakes on the smallest or no provocation; and, most wonderful of all, his young mothers, having taken years to discover that their husbands are not quite what they originally thought them to be, calmly run away from them, and (marvellous to say) their babies as well, without a pang! All this, besides being untrue to common human nature, reveals the strivings of a diseased and fantastic imagination after something unconventional, new, strange, and, sooth to say, disagreeable.

So with general fiction, which is, in part, the reflection of what a nation's intellectual recreation is. To the modern novelist and story-writer we owe that uncanny creation, the New Woman, who, if she really existed, would be a little worse than an indifferent man: which is saying much. Then, again, some writers carry their striving after new effects to the extremity of attempting to plan out their narratives according to some imaginary scheme or design. Thus, a particular incident or scene is supposed to typify a given part of the chromatic scale—a murder suggesting red; remorse, blue; jealousy, yellow; and so on, until your book, with a considerable quantity of what the late Mr. Dickens's Marchioness called "make-believe," may be supposed to approximate to a tolerably close allegorical reproduction of the solar spectrum. As to painting, and what is admitted to be the very essence of impressionism in its total disregard of the conventional methods governing colour, lighting, and definition, examples are just now too numerous in the neighbourhood of Piccadilly and St. James's to need mention at my hands. Go and see them for yourselves. Finally, not to unduly lengthen this part of the paper: the growing tendency of the better class of black-and-white illustrators to veer towards a dreamy suggestiveness and vague indefinability of style and form has culminated in the evolution of that remarkable young man, Mr. Aubrey Beardsley, whose drawings and sketches are appallingly original and eccentric. On the whole, from the foregoing illustrations, it may be deduced that impressionism cares nothing for truth; that it follows the imagination wherever it turns; that it seeks to know no amenability to intellectual discipline; that it is, in fact, the expression of unbridled licence, an eager yearning after the new, the strange, the grotesque—after anything or everything which has in its composition something in the nature of a revolt against generally accepted forms and ideals.

The Revolt against Conventional Photography.

The parallel, I humbly submit, extends line for line to photography, in which impressionism has plainly—perhaps too plainly—manifested itself of late. During the last ten or twelve years many influences have exerted themselves on photography to ensure the possession to camera pictures of higher natural truth, and more of the elements of refined taste, realism, and æsthetic charm, than was the case within all our recollections, until pictorial photography has reached a stage of excellence in effective translation of most subjects of which we are proud. But already some of us appear to have tired of the limitations by which we are bound, and have revolted against the old and intelligible methods of expression with, perhaps, not the most happy results. What are the effects and consequences of this revolt? We have all heard of the problem play and the problem novel—grotesque things with jargon names invented by impressionistic writers of the kind to whom I have referred. They invariably conclude with a note of interrogation, while the meaning of the entire work is left equally unintelligible. Here, too, the parallel holds good in photography, for have we not with us now the problem photograph? Under the plea that they possess "individuality," "imagination," "feeling," "subtle tonality," and other qualities, laboriously conceived and executed nebulosities and crudities are now produced, evidently meant to look as unlike photographs as it is possible to make them, and which we are asked to fall down and worship as the apotheosis of pictorial photography. Surely, now that we have reached that stage in the history of pictorial photography when on the walls of our exhibitions it is possible to have representations of nature as nature may be conceived of but never seen, and the titles of which are just as puzzling and debatable as are the "pictures" themselves, we may pause and seriously ask ourselves what photographic impressionism is, whither it is leading us, and how long the thing itself is likely to survive the ridicule it challenges.

A Protest against Photographic Impressionism.

Of course I am not decrying the play of disciplined thought and imagination in pictorial photography; but I am in all humility protesting against the many sombre and inscrutable impressions of the face of nature which are being passed off as illustrative or typical of the picture-producing powers of photography. "A *picture* is seen in an instant" is a remark attributed to the late Thomas Constable. There are some so-called pictorial photographs which were hanging a few weeks ago in a gallery not a hundred miles from Piccadilly which could not be seen in a century. Why should this be? After all said and done, in the bad old days of blank white skies, poor composition, microscopic definition on every plane, faulty lighting, and other defects, you could always see what a photographer was driving at in his picture; but it is not so nowadays, thanks to modern photographic impressionism. Again I ask, why should this be? Is Nature herself always an enigma, a problem, or a note of interrogation?

No, gentlemen, Nature is not nearly so black as she is photographed—according to the new style. She is not mostly fog or mist-bound; the skies are not always covered with storm clouds; it is not always gloomy evening when we go out with our cameras; and the grey, formless, dull, depressing, indefinably shadowy moorland, river, and landscape views that so largely abound do not by any means give a fair idea of Nature's moods. Bless you, no! The sun sometimes shines; the sky is occasionally blue and flecked with golden yellow clouds; and now and then the grass ripples and waves, the trees are a mass of shimmering leaves, the flowers bloom, and the air is clear and transparent. It may be well to place this interesting fact on record; the newest photographers do not seem to be aware of it.

A square inch of photograph is theoretically more valuable than a square foot of frame; fortunately, however, all photographers do not think so. Rough-surface papers are not more difficult to manipulate than albumen paper; but they admirably lend themselves for printing technically defective negatives, so that their use must not be too rashly ascribed to the exercise of æsthetic acumen. In the production of pictorial photographs a knowledge of technical photography is no disadvantage, whereas, in impressionistic photography, it is usually superfluous. Impressionistic photography does not necessarily involve the employment of both a camera and lens, but their use and possession need not on that account be held to constitute a mark of intellectual inferiority.

Photographic Impressionism the Whim of an Hour.

Shortly speaking, it is the avowed aim of numerous able and well-intentioned photographers to produce photographs which bear no superficial resemblance to having been obtained by photographic agency; and, though I must own to having some sympathy with these and other efforts to bring photography into line with older methods of graphic representation, there is great danger of the movement being carried to ridiculous extremes. Hence it may be well to point out to young workers, who are susceptible of being seduced into imitating the amusing pictorial experiments of those whose work, in giving expression to what has been termed individual feeling, leaves the student in perfect darkness as to what or how the producer felt, that the photographic, as opposed to the impressionistic, method of reproduction probably in effect approximates more closely to the joint perceptions of the eye and the brain, and that, if

this theory is made subservient to one's efforts in picture-making by photography, the happy mean of the all-important qualities of definition and focal treatment is more likely to be attained.

You all remember the æsthetic craze of some fourteen or fifteen years ago. In originality and quaintness of dress, furniture and household decoration, people carried the sentiment to extraordinary lengths. This was a species of impressionism. It lived and had its day, but is now quite dead. At the present moment a more sober and rational taste in such matters prevails. There has been a reaction, not perhaps unaccompanied by some profitable lessons derived from the better influences of æstheticism. May it be permitted me to hope that here again the parallel will be preserved as regards that whim of an hour, photographic impressionism? I do not look for the appearance of the reaction yet awhile, for I am persuaded that photographic impressionism has little more than entered upon the middle stage of its adventurous career. The supreme genius of Mr. Roland Briant will surely not rest content with that astigmatic triumph, *The White Robe of Winter*, which might possibly be a view of snow-covered trees, or might not; or with the rightly named *Swamo*, which equally might, or might not, have been produced by the irregular contact of a printer's roller with a white sheet of paper. No. The immediate future has much in store for us, I am convinced. I anticipate the realisation, next year, of Albert Smith's idea of a view of *London in a Fog*—that is, a sheet of paper simply covered with a murky brown pigment. Thence to pure white paper, as a representation of snow, is but a step, and who knows but that, when we have had a satiety of fog scenes, night scenes, snow scenes, and all the remaining infinity of blurs, some impressionistic photographer may be induced to try the curious experiment of placing a well-defined object or figure amid shadowy surroundings, so that by these singular means we may actually arrive at the *renaissance* of lenticular photography from the chaos of photographic impressionism?

THOMAS BEDDING.

SOME NOTES ON AN EXHIBITION.

NOT to know Puddlebury is to argue oneself unknown. There is only *one* original word in that—Puddlebury is *the* great centre of Art Cultivation. When, therefore, the Puddlebury Tripod Club decided to hold its Universal Exhibition of Photographic *Pictures*, as distinct from a Photographic Sample-room, the world stood at gaze, and from all parts a desire to support this grand artistic feast was manifested.

The outcome, before the Committee of Selection had *sat on* several of the offered exhibits, was somewhat incongruous, and the result, as I propose to show, after they had conscientiously executed their duty, was perhaps still more so, so far as the intimation of their want of success was received by many of the rejected. Let me, though, here note that some of the unsuccessful, taking a reasonable view of their position, wrote acknowledging the justice of their exclusion, and intimating their intention to use the lesson to advantage and try again when they felt they had much improved their work or guided it into proper channels, and some even thanked the Committee for not hanging their entries beside what, on visiting the Exhibition, they felt was so far superior to anything they were at present capable of producing. These few notes were, of course, gratifying in the sense that the writers evidently appreciated their own shortcomings and the fairness of the Committee's action, and were therefore likely to try very hard for improvement, probably eventually becoming in some cases, valuable exponents of pictorial photography.

But—— Well, Mr. Editor, you have sat on such committees, as is evident when we notice to what your personal appearance is brought by the anxiety and trials which could only result from such martyrdom. Those grey locks—or what remains of them—that reduced physique, that sadness of eye, that abstemious asceticism could only be the result of continuous judging of innumerable Photographic Exhibitions and the onslaughts of the unfortunately unhung.

The disappointment of the rejected must claim our sympathy, especially when the lesson is seriously taken to heart. We have often such trying, in a friendly way, to ascertain the causes of their rejection; these, if we can remember anything about it, we are glad to help with quiet information or suggestion; it is mostly gratefully received, and does good all round.

For my sins I was nominated a selector by the General Committee of the Puddlebury Tripod Club's Universal Exhibition of Pictorial Photography, and the rejected have worried us ever since. What are these men who take such trouble, what is their object? Does, for instance, the previously unheard-of man who writes to inform the Hon. Secretary, "I was aware that I had an enemy on your Committee, but not aware that he could secure the rejection of all three of my exhibits," imagine that the Committee will immediately alter its previous decision on receipt of his letter? Then, there is another who, for his own ends, has given the Secretary an advertisement for the catalogue, and also sent before the Committee of Selection a photograph of the utmost excellence, but *purely technical* and unfitted for the P. T. C.'s Universal Exhibition of *Pictorial* Photography. This gentleman is very emphatic, and writes: "I call it a d—— swindle; when I paid the 2*l.* 2*s.* for advertisement in the catalogue, I thought I was to have my exhibit hung especially when I sent in the best thing I've ever done. . . . It's a fraud. . . . Why don't you say no professional work, however perfect, will have a chance of being hung?"* Does this man improve his position in any way by writing thus? Rather the contrary, I should think, for he insinuates pretty freely the idea that the Committee of Selection is to be purchased by the payment of a guinea or two, for which he has already received full value, of which payment they can have no possible cognisance, and, at the same time, discredits himself still more by intimating that he expected to buy them cheap.

Another rejected is "quite at a loss to understand why I have been treated so badly at this Puddlebury Exhibition. . . . . I am further slighted by having the whole of my work, which has been a considerable cost to make, rejected. The carriage alone was between 2*l.* and 3*l.*, including return." Now, why does he trouble the Committee with these particulars, which can have no possible interest for them? He surely cannot suppose that, even if they had had them previous to adjudication, they would have received consideration? Why did he not save his postage penny for tobacco? Another style is that of the rejected who holds out a terrible threat as follows: "I have been at considerable trouble to send pictures to your gallery, and had them refused after all. I should feel much obliged if you will kindly tell me if you have looked at my pictures *at all*, or give some reason for their being rejected? Failing this, I shall not send any another year." Well, from what I remember of this writer's work, he would, perhaps, save himself trouble if he acted on his threat, as, photographically or pictorially, "'e dunno' where 'e are."

There are other funny little letters received, such, for example, as that sent presumably by a bank clerk, who does not care to back his interest in photography to the extent of a shilling or two. This epistle is on a memorandum form of the Welsher Banking Company, Limited, Queer Street Branch, and in a simple child-like way and a beautiful handwriting, informs the Secretary that the writer "will feel obliged if the Secretary of the Puddlebury Exhibition will forward two tickets of admission by return." The inquiry by the Secretary "by return" as to what his claim for free admission might be, elicited no response. Then, there is the anonymous gentleman so well known to the readers of the *Twinkling Star of Strand-on-the-Green*. "The largest circulation on Kew Bridge and district," to quote the heading of his post-card. This gentleman signs his name simply "Sulphate (Arts, Crafts, and Photography)." Now, of course, every one knows who the great "Sulphate" is, and has also heard considerable anxiety, when in China or Peru, expressed as to the opinions of the "*Twinkling Star*," &c., &c., and will appreciate the probable value to the Exhibition of its favourable criticisms, especially those of "Sulphate," so his demand for a season ticket was left unanswered. Whether the result will be that the Exhibition will be compelled to close its doors in a day or two, a breathless world is anxiously waiting to ascertain.

Most exhibitions are held at yearly intervals, and exhibitors have practically a year in hand to prepare work, yet some are never ready, and write to ask, notwithstanding a final date stated for entries, whether they can have two or three days' grace. Do these good folks expect the Committee to delay selection till their wonderful work arrives, or do they think the Committee will exclude a good few other entries in order to keep room for it eventually? Nor must I end without reference to the entries, too numerous and too hopeless, sent in by those who, having apparently possessed themselves in recent weeks of a cheap outfit, have actually succeeded in getting two or three unfogged negatives, the prints from which, no doubt, received the excited admiration of their family circle, under which impartial encouragement they seem to have immediately rushed round to a cheap frame shop, and, having, by the expenditure of a nimble ninepence, surrounded their works with a thin margin of the sawdust persuasion, inflict their efforts on a Selecting Committee which has, kindly permit me here to inform them, no time to

* Thirty-nine per cent. of the exhibited pictures were professional work, which, considering the average of such work as supplied to the public, was encouraging as showing the good this Exhibition was doing among professionals.

spare, and is sufficiently hard worked without having to exclude, "at sight," such entries.

Note.—Lest your readers should imagine this is a mere skit, I beg to say that, with changed names and addresses, all quotations of communications are exactly as received. HENRY E. DAVIS.

ANTWERP AND THE CITIES OF FLANDERS.

To take a hasty look at the Antwerp Exhibition and visit the cities of Bruges and Ghent was the object of my journey during a portion of this year's holiday. Numbers of Englishmen have visited Antwerp, and among them a fair percentage of photographers, who have found plenty to interest them and make sun pictures from. The gentleman who exposed on two occasions during flying visits (Saturday night to Monday morning) forty-two to fifty plates each day, and nearly all successes, established, I should think, a record for hand-camera work, especially when it is borne in mind that it embraced all the principal buildings in the city, points of interest in the grounds of the Exhibition and characteristic groups, besides ascending the cathedral tower (which has 612 steps) and getting good negatives of the interior of the cathedral and church of St. Paul, &c.

In my own case, I was not so ambitious, but rather sparing in the number of snap-shots I made, having a roller-film camera with me that I wished to test for Continental travelling and to find out its capabilities practically.

Starting from Liverpool-street Station by the train before the boat express, one had (in August) a pleasant journey by daylight, with the advantage of getting on board at Harwich before the general rush of passengers and (when travelling second class) securing a berth, that are far too few in number for the excursionists and travellers that come by the boat trains, not only from London, but the Midlands and the North. The advantage of the Harwich-Antwerp route is obvious, *if* you can get five or six hours' sleep, for then a day is not lost, and one wakes up to go on deck in daylight and enjoy the sea-breezes before arriving at Flushing and going up the river Scheldt.

The opportunities for using the camera, except for boat pictures, do not commence till nearing the quay at Antwerp, for the country on both sides of the river is flat and uninteresting. Once landed, after getting a panoramic view of the central portion of the city, including the Cathedral, there are plenty of objects of interest—the busy steam ferry-boat, large liners, and shipping of all description making pictures on the noble river under various aspects of light that are bound to be pleasing. After getting quarters at the Queen's Hotel (in the central part of the quay), the next thing to do was to make for the Exhibition and, during the hours of daylight, inspect the exhibits, keeping an eye especially on those allied to photography. That which first came prominently under my notice was a representative display by the Association Belge de Photographie, with some very fine large transparencies of scenes in the Ardennes, some good platinotypes by Fabronius, of Brussels, and some good portraits, while in *genre* subjects M. L. Bennert, of Antwerp, with *The Servants' Party*, &c., and M. Alberic Lunden (amateur), with an interior, had pictures commanding special attention. The mechanical processes were represented by Jos. Maes, of Antwerp, with some fine plates of architecture, while Waterlow's excellent show of collotype, photo-etching, half-tone blocks on copper, chromo-typography, and Woodbury printings were of a class that was thoroughly representative of the best English work.

The apparatus can be dismissed in a few words, for beyond the fine display by Watson & Son of cameras in brass and aluminium mountings, there was really nothing that one in the habit of seeing good apparatus would pay more than passing attention to.

The railway companies had some fine stands of photographs, the Midland Railway having as many as seventy-two splendid views of scenery and places of interest on their line, in size about 15 × 12, while the Great Western Railway had four stands of sixteen pictures each, and the South Eastern exhibited about four dozen views.

A novelty in the Transportation Department, was a giant stereoscope, set up in the interest of the Hamburg-American Line, and this, with its twenty-five pair of lenses in handsome oak casing, placed in a curtained recess, was a source of attraction, showing, by fifty or so glass transparencies, the various ships of this line, exterior and interior, with very fine effects in the majority of instances. The pictures were illuminated from the centre of the large chamber forming the stereoscope, and were changed automatically. In some instances the views were coloured.

I cannot leave the subject of photography at the Exhibition without mentioning the fine enlargements of Leon Baetes, of Antwerp.

In the grounds there were plenty of objects of interest, including the Rouvallion Column, made up of representations of pots of extract of beef, and all the gaiety and colours surrounding the theatres and side shows; but, as no cameras are allowed in Old Antwerp without special permission, or in the street of Cairo, I had at each place to leave the camera at the ticket-box.

That Old Antwerp is charming there can be no second opinion, and, as some amateurs were in the "sacred" precincts with the camera and tripod, I made inquiries, and found that permission had to be sought from the *concessionaire*, viz., Mr. E. Lyon Claesen, photographer and publisher, 8, Rue Berckman, Brussels; but, my time in Antwerp being limited to a few days, I could not wait for the application and reply.

The Congo village was unique and effective as a picture, while the natives were amusing, their coiffures being remarkable, and their faces marked in strange manner by deep flesh cuts on the cheeks and forehead. Altogether there was plenty inside and outside the Exhibition to please and amuse, but generally it was disappointing from a technical point of view, as far as photography and optics were concerned, and did not impress me nearly as much as the Brussels Exhibition five or six years ago, although that had a good deal of the bazaar element in it.

One could not leave Antwerp without seeing the well-kept and prettily arranged Zoological Gardens, and here there were plenty of studies; but, not having the camera with me, I unfortunately lost the opportunity. It just showed me that one should have the camera always in daylight, for it is no use regretting after the subject has passed, and I did feel cross with myself when I saw three Dutch ladies with the balloon or crinoline skirts, and the typical caps of the country, and satin bodices with short, tight-fitting sleeves (showing the wrist and lower part of the arms), taking such a genuine interest in the animals, that one could have got a "snap-shot" at them without giving offence, and brought home a unique picture.

From Antwerp, the next place I wished to visit was Ghent and its Cathedral and fine Town Hall, taking train in the morning so as to have a few hours there getting negatives and seeing the sights; on to Bruges in the afternoon, and from thence to Ostend before nightfall. This, with care, can be managed very well in the one day, but the photographer is handicapped, for several of the important buildings face north and north-west, and are consequently only illuminated late in the afternoon. Such a place is the entrance to the Fish Market, Place St. Pharailde, Ghent. Those I did take such as the Cathedral, Town Hall, also a fine corner of the latter with statues in niches, and a view up a canal from the bridge at the end of Rue de Bruges make pictures. The difficulties inseparable from hand-camera work are intensified with a roll-holder film-carrier, having no rising front or other adjustment for taking tall buildings in confined positions, and so the large architectural subjects are not so satisfactory as landscapes or street scenes. A notable instance I have before me in the photograph of the Château de Rabot, Ghent, a fine, double-coned and turret-roofed building, dating back to A.D. 1488.

On the way to Bruges and Ghent, my fellow-passenger, who was a season-ticket holder on the line, had to show his ticket to the collector, and I then saw it had affixed a photographic likeness of the owner. Here I thought was another development of the black art, and a source of revenue to the trade, but perhaps it would not be liked in England, for the average run of season-ticket holders, when asked to show their season tickets, simply glare at the collector, or waste as much time as possible fumbling in their pockets for the valuable coupon: so how they would like an innovation where not only the dates of issue could be seen, but the counterpart of the physiognomy of the issued as well, I leave my readers to guess. As many season-tickets are lost and not returned to the railway company or the owner, this arrangement would render their unlicensed use less likely.

In Bruges one has the Cathedral from the main street, also the square tower, and a very fine Hôtel-de-Ville (this latter illuminated late in the afternoon), and plenty of canal scenes, notably the back of the Café au Rivage, dating back to 1630. The interior of the Cathedral and of the adjacent Church of Notre Dame are sights to remember with their beautiful monuments and massive brass altar-doors, besides (as in most of the churches in Belgian cities) the splendid pictures. It is told of one of the pictures in Antwerp that the celebrated *Christ Scourged* by Rubens, which is supposed to have taken the artist only six days to paint, and for which he was paid the sum of 60*l.*, an American millionaire recently offered to purchase for 320,000 dollars, or about 64,000*l.* sterling. This instance shows the

enormous value of the pictures by these masters, which are mostly the property of the Church, although the nation have a number of great value.

The Bell Tower of Bruges is not only an object of great interest, but also historical with its wonderful bells, and, if time permits, the belfry should be visited.

To Ostend and the sea, with all its charm of promenade and sands, was the next step, and, notwithstanding the interest of all one had seen in the old cities, the contrast was agreeable. To the photographer there is plenty of occupation in the morning among the bathers, and in the afternoon and early evening (if summer time) the beautiful Digue and Kursaal. Taken altogether, it cannot be other than an agreeable trip, if the weather is favourable and sufficient time is taken to see all the sights in the old and modern cities of Belgium.

G. R. Baker.

PHOTOGRAPHIC EXHIBITION AT THE IMPERIAL INSTITUTE.

We have received the following communication :—

The Executive Council of the Imperial Institute have announced that a special Exhibition of photography, in its application to the arts, sciences, and industries, will be held at the Imperial Institute in connexion with the United Kingdom section, during the summer season of 1895.

An influential committee of advice has been formed composed of governors of the Imperial Institute, and scientific men of well-known standing who are interested in photography; and sub-committees have been appointed in connexion with the seven sections of the Exhibition, viz. :—

Division 1 —The history of photography, including illustrations of early processes, the progressive development of processes, the early processes of photo-mechanical work, and modern photographic literature.

Division 2.—Artistic photography, comprising a thoroughly representative exhibition of all schools, embracing knowh as well as new works, and illustrations of the present condition of photographic art in the various Colonies and in India.

Division 3.—Photography as an industry, demonstrating the apparatus used in photography, and the special processes connected with the preparation of lenses, the production of brass fittings, cameras, &c., shown in actual operation; the preparation of dry plates, coating of sensitive media, printing processes also shown in actual operation, reproduction of pictures, and the production of portraits by daylight and artificial light.

Division 4.—Photography in its application to industries, such as reproductions having photography as their basis, as applied to illustrated journalism, literature, &c., and industrial applications of photography to ornamentation.

Division 5.—Applications of photography to the sciences, including orthochromatics, optics, stereoscopy, photo-micrography, spectroscopy, meteorology, and magnetism, astronomy, automatic recording apparatus, &c.

Division 6.—Applications of photography to educational purposes.

Division 7. — Miscellaneous applications of photography, including applications of photography to architecture and archæology, to engineering, to military and naval purposes, to legal purposes (such as the detection of forgeries), to surveying, cartography, chronography, &c.

Notification of the Exhibition will shortly be transmitted to the principal firms engaged in the manufacture of apparatus connected with photography in the United Kingdom.

The Governor-General of India, the Governor-General of the Dominion of Canada, and the Governors of the various Colonies have, by a recent mail, been requested to invite Indian and Colonial manufacturers to exhibit.

EALING PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Preceded by a *conversazione*, at which a large number of ladies and gentlemen were present, the Exhibition of the Ealing Photographic Society was opened on Wednesday evening, November 21, in the large and handsome hall of the Victoria Public Building, Ealing. The Exhibition, which was practically the first held by the Society, had two Open Classes, and could not have been placed amid surroundings more agreeable for the purpose. The display, on the whole, was an extremely creditable one, but in future exhibitions held by the Society we would suggest that greater attention be paid to the hanging, so as to secure a more harmonious *ensemble*, and that a more rigid selection be exercised as to the examples of members' work hung.

In the members' classes Mr. A. S. Handford was very successful with some *Home Portraits* of ladies, beautifully printed in carbon, and, besides receiving a bronze medal for a red carbon study of a young lady, *In the Garden*, was highly commended for three charming views in photogravure, which, as examples of the process, were admirable, showing perfect gradation and delicacy of rendering. Mr. J. T. Fairs had some good figure studies well printed in bromide, and of the exhibits of Mr. A. Ernest Smith the carbon work was especially noticeable, two portraits—*Miss Duncombe* (at home) and *Mrs. Smith*—evincing high artistic treatment, careful posing, and correct lighting. Other exhibitors of good work in the particular class referred to (B : Members who had not hitherto successfully competed in the class) were Mr. R. Y. Murphy, with a clever and amusing series of canine studies, *A Gay Dog;* Mr. A. F. Taylor, an interior view by this gentleman showing careful technique; Mr. R. M. Dawson (Zoo studies), and Mr. J. Oakeshott. In the class for pictures not previously medalled, Dr. G. McDonald's Cornish views (in carbon) and his flower studies were meritoriously conspicuous. Class D (previously medalled pictures by members) was monopolised by that sterling good worker, Mr. C. R. Whiting, who, in fact, as the poet says, ran it "on his own." He showed his ever-welcome *Early Morning* (a sea shore piece), *Waiting for the Tide*, some clever interior work, and the large blue carbon, *Nocturne*, that was hung at Pall Mall. Mr. Whiting's little show was an exhibition of itself. His work is always characterised by a happy combination of technical excellence and artistic feeling.

The Open Class was fairly good and representative. A bronze medal was awarded to Mr. C. S. Roe for his *North Devon Trout Stream*, a bright and pleasing view of infinite delicacy and charm, capitally printed in platinum. Mr. P. Lankester gained a similar award for a pretty head study, *Clytie*, possibly the same subject differently treated, which received judicial commendation at Hackney. Mr. Lankester's portrait studies are always good, "instead of which," as the old phrase runs, he also goes in for landscapes. Standing before the two he sends to this Exhibition, we rubbed our eyes and murmured, "Can this thing be? Are not these cloud and sheep studies very like the work of a certain H. P. Robinson, which we saw hanging in the centre of the left wall of the Salon?" A closer resemblance in style and treatment we never saw. The doughty "H. P." should feel highly flattered. The silver medal in this class was awarded to Mr. F. Dovaston for a remarkably evenly rendered interior view of *St. Bartholomew's, Smithfield*. Messrs. W. Thomas, Warneuke, H. R. Rainger, C. B. Moore, and W. A. Brown were well represented in the class.

In the Champion Class Mr. Eickemeyer took the silver medal for his *Portrait of my Father;* and Mr. Smedley Aston, the bronze for a good view, *A peep at North Wales*. The class, which was not a particularly strong one, included familar works by C. S. Roe and W. Thomas. In the Open Lantern-slide Class Mr. J. H. Gear was awarded a silver medal for his Westminster Abbey scenes, and Mr. G. Hankins a bronze. A loan collection included some fine examples of carbon and photogravure work by the Autotype Company; and some of Mr. Henry Stevens's dog and flower studies. Mr. E. C. Porter also showed some excellent portraiture. The Exhibition was singularly strong in carbon work of a good quality.

The Judges were Mr. W. England, Mr. F. Hollyer and Mr. E. J. Wall.

PHOTOGRAPHIC EXHIBITION AT THE STANLEY SHOW.

The Exhibition of photographs which is put forth as one of the minor attractions of the Stanley Show of Cycles is unquestionably good of its kind, and may fairly be said to be the best of the series yet held, as it is, perhaps, the largest. This year the frames are hung on four sides of two wooden erections in the centre of the Arcade Gallery, the space against the walls being reserved for apparatus. The Judges were the Rev. F. C. Lambert, Mr. Alfieri, and Mr. Horsley Hinton, and their awards, except in one or two cases, struck us as having been well placed. They disposed of nineteen medals, so that, whatever objection may be taken to this Exhibition on the score of its being merely a side show to a display of bicycles, it is at least entitled to be regarded as a medal-hunters' paradise.

The fact of several exhibitions being held in one week obliges us to exercise the greatest brevity in each case, so that we can only touch upon the salient characteristics of that at the Agricultural Hall. In Class A (landscape) the gold medal went to Mr. Lewis Cohen for his well-known *Bivouac*, the inevitable *Sweet Home* of Mr. Eickemeyer taking the silver, and Mr. G. S. Pasco, somewhat luckily, we think, gaining a bronze for a pretty little view, *A Backwater*. The class was of fair merit, good work being shown by Messrs. P. Lankester, W. Scorer, Warneuke, and R. H. Lord.

Exceptional excellence characterised the Hand-camera Class (B), most of the pictures evincing both technical and artistic merit in a marked degree. For a set of four delicious little river bits Mr. W. Thomas took the gold medal, Mr. Welford winning the silver for some minute evening effects on the river, &c., of much artistic charm. Some capital *Bits by the Sea* earned Mr. J. B. Johnston the bronze, and other exhibitors deserving notice and commendation were Messrs. A. Kemp, A. G. Peck (good Italian views), J. W. Wharton, and W. S. Downes (studies on Yarmouth beach).

Seascape and marine subjects formed Class C, in which the gold medal, to our thinking, was wholly misplaced. It went to Mr. A. R. F. Evershed for *The Ebbing Tide*, a little seashore piece with craft, evincing, so far as we could discover, no particular merit. Mr. W. Norrie took the silver with *Mist Effect on Myggeneat*, and Mr. W. Clement Williams's grand sea piece, *But such a Tide as Moving seems Asleep* only obtained him the inferior glory of a bronze medal. Mr. Williams's sea studies were very fine, as, indeed, were Mr. Marsh's. Mr. J. H. Gear's imitative

faculties find scope in *Going to Sea*, which, not only in title but in subject, much resembles Mr. A. J. Golding's well-known view of a tug towing out a Yarmouth fishing smack. *An Exciting Finish on Lake Windermere*, by Mr. R. T. Ford, is a capital yacht study, showing the craft heeling over very much. Mr. C. R. Whiting, Mr. H. W. Bennet, Mr. W. Martin, and others combine to make this an excellent class.

In Class D (Figure Studies and *Genre*) some admirable work was hung. Mr. J. Moffat's gold medal for *The Master Hand* (a sculptor at work) was well earned. Mr. Stieglitz and Mr. Eickemeyer won the other medals in the class, which was noticeable for some clever flashlight *Twelfth Night* scenes, by Mr. E. Pearce; Mr. S. G. Payne's amusing study of child life, *Village Life after School;* portrait studies by Mr. Lankester, and other examples of sound work by Messrs. Anckorn, Diston, Marsh, &c.

The medals were withheld from Class E (Portraiture), which contained some good (and bad) work. For example, men astride safety bicycles certainly afford no possibility of artistic results in the way of portraiture. On the whole, we are inclined to agree that the Judges acted rightly in this instance. Mr. Eickemeyer's *My Father* and Mr. Lankester's efforts were, perhaps, of highest merit. The rest of the exhibits were mainly of the shop, shoppy.

Beginners found their opportunity in Class F, which included many remarkably good works. Mr. W. Smedley Aston's portrait head of an old *Gardener* secured the silver medal; a charming, if highly diffused little *Reedy Waterway*, by Mr. G. E. Marshall, and Mrs. G. R. Bury's *Kinness Burn, St. Andrews*, bronzes. Mr. C. H. Dawkin, Mr. A. Copping, Mr. A. G. Cooke (*The Altar, St Paul's*), deserve a word of encouragement.

Mr. Welford, with a pleasing delicately treated little view, *The Ferry*, was awarded the silver medal in the Class G for pictures taken by apparatus carried on a cycle, and Mr. Brownrigg the bronze for a pretty rendering of *Iford Bridge*.

Class H was labelled "General," and was of a cosmopolitan nature. Mr. S. G. Payne took a bronze medal for *Waverley Abbey Ruins*, a similar distinction being conferred upon Mr. J. E. Goold for his series of clever and interesting torpedo and bullet photographs. Mr. Goold deserved something more than a mere bronze.

We are sorry that the heavy demands on our space compel us to abstain from detailed criticism of the pictures in this and other exhibitions, but exhibition committees and organizers have only themselves to blame in so stupidly arranging their dates.

The Apparatus Section is scarcely so large as we had expected, although there are a fair amount of exhibits.

Messrs. Adams & Co. are well represented by a variety of hand cameras, field cameras, changing boxes, lenses, finders, and optical lanterns. Their new "Brilliant" finder is shown in several sizes and many numbers. The tele-photo lens, too, forms an element in a comprehensive show. The same may be said of their view-meter, and, indeed, of many other specialities. In addition to their hand cameras, most, if not all, of which have been described in this JOURNAL on former occasions, Mr. Adams showed us one just about to be brought out, in which he appears to have solved the problem of differentiating between a packet of films placed in a camera, without these being separated one from the other by so much as the intervention of a slip of black paper. It holds six dozen quarter-plate films. It is not yet placed on the market. It is to be named the "Ledo."

Butcher & Sons, in addition to cameras of various descriptions, including their "Primus" hand camera, exhibit a quantity of optical lanterns and various specialties connected therewith. They also show a series of cloud negatives for printing clouds on lantern transparencies. The employment of these is much to be commended.

Airs & Co. have a display of appliances to which their trade mark, "Bessus," is applied, including plate and film-holders, jet-centerers, safety dissolvers, various lantern accessories, and a biunial lantern containing many ingenious appliances for effecting adjustments.

Wormald & Co.'s exhibit comprises lantern and stereo masks and bindings, lantern-slide printing frames, and other things which conduce to the comfort of the lanternist.

Platt & Witte have biunial and single lanterns, aluminium and brass fittings for cameras and lanterns, developing and other lamps.

Other exhibitors are the Vidette Camera Company (hand camera and enlarging box); J. Hannam (mounts, cameras, lanterns, and albums); the Timberlake Saturator Company, and some half-a-dozen others whose exhibits, although catalogued, had not been laid out at the time of our visit.

Our Editorial Table.

Composition for Backing Dry Plates.

By Mawson & Swan.

This composition is really a collodion, which can either be poured over the back of the dry plate, in the same way as varnish is applied, or may be applied through the agency of a brush. The collodion holds in solution some substance of a non-actinic colour, by which the light that passes to the back of the plate is arrested and deprived of its power of causing halation. The ease with which it can be applied or be subsequently removed, and the rapidity with which it dries, are all very valuable features in this "composition."

Vevers' Photographic Primers.

The pamphlets already issued by Mr. C. C. Vevers, Leeds, are respectively devoted to (1) *Beginners' Errors*, (2) *Photographic Optics*, (3) *Printing Dodges*, and (4) *Enlarging on Bromide Paper*. Taking these in their order, the first error made by the average beginner is the idea that photography will be a "rattling good hobby" and nothing more. The author disabuses him of this idea, and tenders some very good advice as to the mode of procedure calculated eventually to lead to success. In No. 2 Mr. Vevers gives some plain talk about lenses, their forms and peculiarities; but, while this number is good as a whole, we would still advise him to rewrite the paragraph treating of spherical aberration, as it is not the case that a single lens such as that figured on the same page, if employed without the addition of a diaphragm, will give a sharp impression of the image over a small space in the centre of the plate, the fact being that a deep meniscus when worked without a diaphragm will not give sharpness anywhere. Notwithstanding this oversight, the booklet contains quite enough information for the class for whom it is intended, and otherwise sound information too. No. 3, *Printing Dodges*, contains numerous hints that are useful, such as blocking out, removing silver stains, spotting, and stripping films from cracked plates. No. 4 treats of enlarging on bromide paper, and confines itself to this very important topic.

The International Annual of Anthony's Photographic Bulletin.

Mr. Frederick J. Harrison and the Messrs. Anthony, the former as editor and the latter as publishers and proprietors, have reason to plume themselves on the literary excellence and general get-up of their 1895 annual. It is profusely illustrated by many photo-engravings of great excellence, in addition to prints on "Aristo-platino" and ordinary "Aristo." The literary excellence of the annual is well maintained, and this department is contributed to by many well-known writers and experimentalists both of America and this country. We shall take occasion to dip into the volume again, and give our readers examples of some of its contents. Percy Lund & Co., London and Bradford, are the English publishers.

New Masks for Stereoscopic Transparencies.

By W. I. Chadwick, Manchester.

No one knows better than Mr. Chadwick the conditions which ought to regulate the mounting of a stereoscopic transparency in order that it shall be really effective. We are not here going to enter into the subject of mounting stereoscopic pictures, or say how often pictures otherwise good are spoilt by inattention to this important particular, but merely call attention to the fact that Mr. Chadwick's masks or mats render it impossible to err in this, provided the photographer is not wilfully blind to the necessity for exercising the minimum of common sense in mounting his pictures.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 22,552.—"Improvements in Apparatus for Developing Photographic Plates." E. Poulenc.—*Dated November*. 1894.

No. 22,596.—"Improvements in or connected with Photographic Cameras." J. E. Thornton and E. Pickard.—*Dated November*, 1894.

No. 22,752.—"Improvements in Albums for Photographic or other Pictures." L. A. Marion, H. Giubout, G. Bishop, F. Bishop, and J. P. Kirk.—*Dated November*, 1894.

No. 22,758.—"Improvements in Jacquard Card." W. Birks, W. J Watson, and J. Taylor.—*Dated November*, 1894.

No. 22,781.—"An Exposing Chamber and Composing Table for the Production of Lantern Slides." W. Tylar.—*Dated November*, 1894.

No. 22,782.—"Improvements in Solid Pattern Metal Dark Slides." W. Tylar.—*Dated November*, 1894.

No. 22,783.—"An Improved Time and Instantaneous Attachment for Photographic Rebounding Shutters." W. Tylar.—*Dated November*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
3	Camera Club	Smoking Concert.
3, 4	North Middlesex	Annual Exhibition.
3	Peterborough	
3	Putney	*Developing Chloride Papers and Films.* J. R. Gotz.
3	Richmond	Slides of Yorkshire Scenery, by the Leeds Photographic Society.
3	South London	Demonstration of the Working of Nikko and Platino-bromide Papers by the Eastman Company.
3	Stereoscopic Club	
4	Birmingham Photo. Society	
4	Bolton Photo. Society	
4	Brixton and Clapham	*Odds and Ends—Old and New.* Colonel J. Gale.
4	Exeter	
4	Hackney	Open Night.
4	Herefordshire	
4	Keighley and District	
4	Lewes	
4	Munster	*Stereoscopic Work.* Hugo Schröter.
4	North London	
4	Oxford Photo. Society	
4	Paisley	
4	Rochester	
4	Rotherham	
4	Sheffield Photo. Society	
4	York	
5	Croydon Camera Club	Nineteenth Public Lantern Show.
5	Edinburgh Photo. Society	
5	Leytonstone	
5	Liverpool Amateur	*Trip to Corsica.* G. E. Thompson.
5	Photographic Club	*Limelight Apparatus.* R. R. Beard.
5	Southport	
5	Southsea	
6	Birmingham Photo. Society	
6	Camera Club	*Some Studies in Emotional Expression.* Sir J. Crichton-Brown, M.D., LL.D., F.R.S.
6	Dundee and East of Scotland	
6	Ealing	Slides by Rotherham Society, &c.
6	Glasgow Photo. Association	
6	Glossop Dale	
6	Hull	
6	Leeds Photo. Society	Annual Meeting and Members' Lantern Evening.
6	Leigh	*Preparing and Sensitising Drawing Paper.* T. Haddock.
6	Liverpool Amateur	*Development Practically Demonstrated.* Mr. Anyon.
6	London and Provincial	*Fading of Albumenised Prints.* A. Haddon.
6	Oldham	
6	Tunbridge Wells	
6	Woodford	*Slide-making and Bromide Printing.* H. Wilmer.
7	Brighton and Sussex	
7	Cardiff	
7	Central Photographic Club	*The Toning and Finishing of Prints in Large Quantities.* Thomas Fall.
7	Croydon Microscopical	
7	Halifax Camera Club	*Stereoscopic Work.* A. T. Gray.
7	Holborn	
7	Leamington	
7	Maidstone	
7	North Kent	
8	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 27,—Technical Meeting,—Mr. F. Ince in the chair.

THERMO-REGULATORS.

Mr. ANDREW PRINGLE, in introducing Mr. C. E. Hearson to the meeting, spoke of the importance of using solutions at a standard temperature, and said that he had tried all the thermo-regulators without success, the Reichert, for instance, showing a variation of 8°. With Mr. Hearson's arrangement he had found no variation.

Mr. C. E. HEARSON then, by the aid of lantern slides, described his arrangement for keeping solutions at a given temperature. In the interior of the geyser were two eight-feet coiled copper tubes, the developer traversing one, and water the other. The thermostat itself consisted of two pieces of sheet copper soldered into the form of a cap, and containing blotting-paper saturated with a volatile liquid. This thermostat regulated the gas valve—when the critical temperature was reached, the thermostat distending; while, so long as it was not distended, the gas passed through. The temperature would thus be practically regulated, and uniform results would be always obtained. The developing solution was poured in through a funnel, the water supply being obtained by means of tube connexion.

Mr. W. E. DEBENHAM described a simple form of mercury thermostat which he had employed for keeping solutions at a fixed temperature.

Mr. PRINGLE said he had used Mr. Hearson's arrangement for nine months, and neither the developer nor the copper tube was affected, caustic alkalies having no effect on the latter. He found it easy to get a developer of the uniform temperature of 70°. The temperature could be adjusted by substituting capsules containing liquids of different vapourising points. In reply to Mr. Chapman Jones, he said he had not found ammonia react on the copper tube. He had not tried glass tubes, as they could not be got in a spiral form. He always passed water through the tube after the developer.

TESTING THE SPEED OF SHUTTERS.

Mr. PRINGLE next described and exhibited a simple apparatus for testing the speed of shutters. It consists of a circular dial marked off into 120 divisions, having an index hand with a convex mirror on the critical point. It is actuated by water power, a box at the back having a set of vanes with a nozzle for the water. A screw nail is connected with the index hand and with a toothed wheel in the box. With a given water pressure, a click is sounded by the wheel, one click per second indicating a rapidity of 2880th of a second, which, when divided by the number of 120 divisions shown in the negative by the revolving index hand, gives the speed of the shutter in hundredths of a second. Mr. Pringle showed several negatives of shutters that were tested in this way. He preferred sunlight for making the exposure.

CHROMATIC PHOTOGRAPHY.

The discussion on Mr. Warnerke's paper, given at a previous meeting, was resumed, Mr. E. J. WALL condemning the colour chart employed, on the ground that the colours were not saturated.

Mr. DEBENHAM, in reference to Mr. Wall's statement of the impracticability of copying very large pictures by monochromatic light, said that he had got over that by covering the windows of his studio with dark-room paper.

After remarks by Mr. LAWRENCE,

Mr. WARNERKE replied, upholding the colour chart he had used as a good test, on the ground of its convenience and approximation in effect to an ordinary picture.

Mr. CHAPMAN JONES showed negatives of a red and black subject on Lumière's red-sensitive plates.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 22,—Mr. H. C. Rapson in the chair.

Mr. A. J. Brown showed several prints on Mariona paper, having a variety of tones, obtained by simple washing and fixing. Mr. Brown characterised the tones as being similar to those yielded by zenotype.

IMPRESSIONS OF IMPRESSIONISM.

Mr. THOMAS BEDDING read a paper on this subject [see page 758].

Mr. W. E. DEBENHAM fully concurred in the sentiments of the paper. If a so-called impressionist presented a smudge and professed that that represented his impression of nature, he would ask, why should not the most exact representation of nature produce a similarly smudgy impression on his mind? If he sees the actual definition of nature as a smudge, then, in looking at a smudge, it should appear still more confused. There might be an exception to this in the case of short-sighted persons, who could see definition in a picture, which could be placed very near to the eyes, which they failed to see in any but very near objects. He thought, however, that for such persons the use of suitable spectacles for viewing natural objects was more to be recommended than the production of photographs simulating the effects of their defective vision. He agreed with Mr. Bedding that the use of rough paper, and other ways by which definition is lost, covered defects that would be very noticeable in a well-defined photograph. The facility this afforded for producing something presentable was probably one of the reasons for the spread of so-called impressionism. Other reasons he believed to be affectation and the desire of posing as something superior to the ordinary photographer.

Mr. P. EVERITT twitted Mr. Bedding with having so cast his paper that it was difficult to determine how far he was really in agreement with others as regards what might be considered impressionistic photographs. Thus, though there might be an apparent agreement between Mr. Debenham and Mr. Bedding on the point, both gentlemen might not have the same class of work in mind. As to impressionism caring nothing for "truth," the question arose, What was truth? He thought that the agitation against impressionistic photographs was simply got up by photographic journalists to fill their papers, and accused those writers of "throwing mud." There was even impressionism among photographic writers, particularly such as "Cosmos."

Mr. C. H. COOKE thought that impressionism in black and white was absurd, while perfectly admissible in paintings, in which an artist could depend for his effects upon a note of colour. He gave a general endorsement to Mr. Bedding's paper.

Mr. J. E. HODD was of opinion that impressionistic photographers had gone too far in their impressionistic effects.

Mr. A. MACKIE observed that the outside public, who knew nothing of photography, did not notice that diffused photographs were out of focus.

After further discussion and remarks by Mr. BARTLETT, Mr. BAYSTON, and others, Mr. BEDDING replied to some points raised in the discussion. As to Mr. Everitt's contention that he had not pinned himself to a particular class of work as being unpessimistic, Mr. Bedding said that at the end of his paper he had evidenced some examples of an extreme character which he thought were sufficiently indicative of what he considered impressionistic photographs. It was difficult to draw the line, but, from his experience of a large number of photographic exhibitions, he should be quite willing to furnish Mr. Everitt with a list of the photographs that came under his definition of impressionistic. Referring to Mr. Everitt's reference to "truth," Mr. Bedding said he quite expected the question. One never used the word in debatable matters nowadays without being met with the Pilatic retort, "What is truth?" He (Mr. Bedding) was not going to commit himself to any definition of the term; but, speaking of photographic reproductions, he said that, whether a lens showed them well defined or not, one fact was certain, and that was that the brain was conscious of the subject itself being well defined, and, so long as that mental faculty remained, so long would most of us look for definition in photographs. Men who publicly exhibited photographs did not do so simply for their own pleasure, otherwise they would confine them to the walls of their own houses. Why, then, should objection be raised to public criticism of them? Touching Mr. Everitt's remarks as to photographic journalists, Mr. Bed

ding hoped Mr. Everitt would allow that they were sincere in their criticisms. Mr. Mackie had raised a very interesting point. In his (Mr. Bedding's) experience, the effect of impressionistic photographs not only on the general public but on many artists, was a highly unfavourable one.

A vote of thanks was passed to Mr. Bedding for the paper.

Croydon Camera Club.—In consequence of serious illness in his household, Mr. Charles Moss was unable to give his promised demonstration of *The Carbon-printing Process* on the 21st inst., his place being taken at short notice by Mr. A. W. Hirst, who ably showed how from a quarter-plate negative a whole-plate transparency could be expeditiously and successfully made, In order that members may be able to follow in his footsteps, he agreed to leave the instrument used for the above demonstration at the Club dark room until Christmas for free use by members. He also offered to attend at the Club one or two evenings by appointment, should two or more desire personal instruction, on any selected night. These offers were accepted by the President on behalf of the Club, his words of acknowledgment to Mr. Hirst being vigorously endorsed by the meeting. Amongst other interesting matters brought forward were the Primus lantern-slide printing frame, which was strongly approved; arrangement for a lantern-slide competition (open to members only) for valuable prizes, entries close on December 12 The main subject of the next public Lantern Show, to be held on December 5, will be *To Chicago and Back in the World's Fair Year*, by Mr. H. Snowden Ward.

North Middlesex Photographic Society.—November 19.—Mr. J. W. Marchant (the President) gave a demonstration on *Platinum Printing*, addressing his remarks more particularly to the more inexperienced workers, this being one of the winter series of Instruction Evenings. After briefly sketching the history of the platinum process, he summed up its advantages as follows:—1. Simplicity of manipulation. A print can be produced more readily than by any other process. 2. The greater sensitiveness of the paper, which is most noticeable when the light is poor, a platinum print being obtainable in half the time taken by silver. 3. The permanence of the prints, the image consisting of platinum, a metal which can be attacked by scarcely any known reagent, hydrochloric, nitric and sulphuric acids, ammonia, caustic potash, and cyanide of potassium not affecting it. 4. The peculiar character of the pictures, which, from the so-called art point of view, gives them a much higher value than silver prints. 5. The prints can also be used as transparencies. 6. All the wearisome washing, toning, washing again, then fixing, and then more washing necessary for silver printing, with the glorious uncertainty of the tone to be ultimately obtained, are avoided. He then proceeded to active work, giving lucid explanations and instruction on the various points,

North Surrey Photographic Society.—The fifth annual Exhibition of prints, lantern slides, and transparencies by members of the above Society was held at the Norwood Institute, West Norwood, from November 20 to 24 inclusive. There were nearly 200 pictures grouped into five classes—landscape, architecture, portraiture, enlargements, lantern slides, and transparencies. Lieut.-Colonel J. Gale was the Judge, and expressed his satisfaction at the general good quality of the work. Certificates were placed at his disposal, and the Committee accorded him absolute discretion as to the extent of his awards, which were given to the following members:—Mr. W. H. Baldwin, *A Surrey Common.* This was a delicately printed picture, and elicited general commendation. Mr. R. W. Wilson, *Old Cramond Bridge.* A soft picture, with good atmospheric effect. Mr. E. Cecil Hertslet, *Salcomb Bridge.* An artistic rendering of a charming view in South Devon. Mr. F. Fitzpayne received a certificate for his *Kilpeck Church Door*, a splendid example of architectural photography; Mr. C. Turner, in the Enlargement Class, for his *Dinant Quay*, a fine bromide: and Mr. Paul Foucard, for a very excellent set of transparencies. Among other members who elicited commendation from the Judge were Mr. Edward Collins, whose *Folkestone Harbour* was perhaps the best of a very good exhibit; Mr. J. J. Morrish (President) for his *Cottage on the Common;* and Mr. P. Foucard, who showed some good technical work. It is needless to say that the pictures exhibited by Mr. Tom Bright, which, however, were not for competition, were fine specimens of the work of that well-known artist. Mr. Lewis Wolff's enlargements were good examples of both taste and quality. The Exhibition was well attended, especially in the evenings, when lantern slides formed a special feature. On the opening night, Tuesday, November 20, slides by the following members of the Society were shown upon the screen: Messrs. Wolff, Hertslet, Wilson, Baldwin, Fitzpayne, Chambers, and Bright. On Wednesday evening Major Lysaght, A.P.D., very kindly exhibited to the members and their friends his most interesting collection of slides, depicting every-day life in Ireland. On Thursday evening a further selection of slides by the members of the Society was shown, among which we may mention those of Messrs. P. Foucard, Waltham, Turner, and Dummett. These were followed by some slides kindly lent by the Camera Club. The Exhibition was brought to a very successful termination by Colonel Gale, who showed his collection of slides entitled *Old Friends and New.* These met with an enthusiastic reception at the hands of a large and appreciative audience.

South London Photographic Society.—November 19.—Mr. F. O. Bynoe, from Messrs. R. & J. Beck of Cornhill, gave an interesting lecture on the "Frena" hand camera, its construction and capabilities. Mr. F. W. Edwards the (President of the Society) occupied the chair. The lecturer commenced by giving an exhaustive *résumé* of the history of the "Frena," which showed that it had passed through many transitionary stages before it had arrived at its present perfected condition. Great difficulty had been experienced in the early days in arriving at a satisfactory method of changing the films, and after testing many devices the present method employed—viz., the utilisation of a pack of forty films (with cards between each film) kept in place by special pins which could be moved from the outside so as to allow the film and card to drop into the receiving box after exposure—was found to be the most satisfactory. There was no possibility of the films "jamming" as in the case of some hand cameras. Great attention was paid to the lenses. The focus was fixed, and was obtained by the aid of microscopes, so that it was not possible to obtain sharper pictures than could be produced by this camera. From twenty feet to infinity was in focus; but, should it be desired to photograph nearer objects, magnifiers were used in front of the lens, which had the effect of transforming the rays of light into parallel lines, thus altering the focus to the required position. Some excellent slides from negatives taken with the camera were thrown on the screen in proof of this. The "Frena" also possessed a swing back, the lever that regulated the film receptacle being merely moved forward until the bubble was in the centre of the level. The camera could be tilted to an angle of 25°, and by the use of this swing back parallel lines would be obtained. Slides depicting scenes from all parts of the world, taken by all sorts of persons and under all kinds of conditions, were shown on the screen, proving that this convenient hand camera is capable of really good work even in the hands of novices. At the conclusion of the lecture a vote of thanks was unanimously accorded Mr. Bynoe, and several of the members stated that they had themselves used the camera with unqualified success.

Putney Photographic Society.—November 22, Mr. H. Faulkner in the chair.—Mr. S. Herbert Fry spoke on *Unconventional Printing Methods.* There was no reason, he said, why a photograph should not be a work of art on technical grounds, and every reason why it should; but with this object in view, it does not seem to him that the ordinary methods are such as are most commendable. The opportunity for the photographer comes in in the adoption of the printing method, and in conjunction with this he should secure the best technical negative possible. The process which lends itself most easily as to colour of image, size, and tone values, is the bromide process. In regard to colour, variety can be obtained; in regard to size, it is the only process by which large pictures can be made without a correspondingly large negative; and, in regard to tone values, almost any character can be obtained. As to printing surface, bromide papers will give almost any variety; and for pictorial, decorative, and artistic purposes, there is a tendency to get away from the purely [conventional glossy prints. "I am at present urging the claims of bromide prints on drawing-papers [several examples of these were shown]. To obtain uniformity of colour, the correct exposure must be found and given, and the picture developed until all the silver which has been acted upon by the light has been reduced. The colour of the paper itself will produce a marked effect on the finished print, and paper can be supplied in various shades of white or cream. The subsequent colour of the image can also be altered by intensification. I have not found uranium a reliable process for this, and incline rather to the following formula:—Bleach the prints with a two per cent. solution of bichromate of potash and a few drops of hydrochloric acid. Expose them to the light for several hours, or even a day or so, then redevelop the prints. It is well to remember that the original image is somewhat intensified by the operation. After the bleaching operation, the prints should be thoroughly washed." A short discussion ensued upon Mr. Fry's remarks, during which it was suggested whether Schlippe's salt could not be used for the intensification of prints, with the probable result of obtaining various reddish-brown tones. Mr. Fry stated he had not tried the method, but should do so. A vote of thanks to Mr. Fry concluded the proceedings.

Woodford Photographic Society.—November 15, the President (Mr. E. Caird) in the chair.—It was resolved, on the motion of Mr. H. Wilmer, that this Society become affiliated to the Royal Photographic Society from January 1, 1895. Mr. Malby, having been unanimously requested to accept the Hon. Secretaryship of the Society, explained that, owing to expected changes in business arrangements, he could not pledge himself beyond the next two months, but during that time he would do his best to serve the Society as requested—on the understanding that they should be prepared to relieve him of the office at short notice. It was resolved that the optical lantern about to be purchased should be fitted to work with either oil or gas, so as to make it more convenient for the home use of members. Tickets for the display of members' work on the 24th inst. were handed to members for distribution among their friends. The Hon. Secretary then gave a demonstration of his mode of making lantern slides by contact, compounding the developer, exposing the plates—Ilford special and Thomas's—and developing the slides, in course of which he pointed out that the quality of the resulting slide might fairly be said to depend on the character of the negative used, as in contact printing there is less margin on this score than in reducing in the camera; that, in his experience, there was nothing on the market to beat the Ilford special lantern plate for crisp black tones, with perfectly clear high lights, though, where brown tones were required and time was no object, the Thomas lantern plate gave excellent results, while, their slowness making it possible to work with a stronger light, they were very useful for beginners. The slides were then passed round for criticism, one of them in particular being favourably commented upon. Mr. Malby explained that this particular slide had not only been made by what is considered to be an inferior process of contact printing, but that the negative (also handed round) was merely a copy of a silver print made from *two* of his original negatives. This, he considered, tended to confirm what he had said about the quality of the slide depending on the character of the negative used.

Bolton Photographic Society.—November 13, Mr. Leigh presided.—Mr. Baldwin, of the Eastman Photographic Material Company, gave a practical demonstration on some of the latest novelties in the photographic world, so far as their own productions were concerned. In a lengthy address the latest developments in apparatus, printing, toning, &c., were lucidly explained, and keen interest was centered in the demonstrations, which were eminently satisfactory in their results. Questions appertaining to the subjects treated upon were put by several members, and the conversational interchange of ideas on difficulties experienced was profitable.

Brighouse Photographic Society. — November 14.—In connexion with the above newly formed Society, Mr. Richard Keene, of Derby, lectured in the Central Hall on *The Peak of Derbyshire.* Mr. Keene explained that the Peak extended over a far greater extent than one was given to understand.

from the map. He did not want to praise up the Derbyshire scenery before the Yorkshire scenery, but he contended that they got a far greater number of picturesque scenes from the limited space than we did in Yorkshire. Some very fine views of Haddon Hall were given, including several views of the terrace. This was the place from which Dorothy Vernon eloped with Sir John Manners. A number of pretty views in and around the following places excited no small interest: Bakewell, Ashford-on-the-water, Monsole Dale, Water-cum-Jolie, Miller's Dale, and Cheedale. The pretty Derbyshire home of Miss Florence Nightingale (Lea Hurst) next attracted especial attention, and several fine views of Matlock were shown. A few charming slides of Chatsworth, one of the seats of the Duke of Devonshire, were next given, including the bridge with the house in the background, and examples of the Duke's famous collection of statuary. Views of Middleton Dale, Eyam, Tideswell, Padley Wood, and on the Moors were also given, the scenery being of a most varied character. Derwent Hall was thrown upon the screen, likewise beautiful views of Hope Dale, Castleton, Kinderscout, and Hathersage. "Little John's" cottage was shown, and lovely views of Dovedale were also exhibited. A number of views of Hardwick Hall, one of the seats of the Duke of Devonshire, were given in conclusion, including several views of the exterior, and the dining-room, drawing-room, staircase, ball-room, and noble picture gallery, containing, among other noted portraits, one of Mary Queen of Scots.

Darwen Photographic Association.—The third Lantern Evening of this Association was held on the 23rd inst. After the entertainment, the PRESIDENT (Rev. Henry Irving) announced that the Zenotype Company, of Liverpool, are sending their representative to demonstrate their process of combined developing and toning with printing-out papers, on or about December 5, it being inconvenient to fix a date until later, when the Secretary will advise all members and friends wishing to be present.

Glasgow and West of Scotland Amateur Photographic Association.—November 19.—Sixteen new members elected. Mr. Ralph H. Elder exhibited about 200 lantern slides, taken during a trip to the Swiss and Italian Lakes, and gave a descriptive lecture.

Kilmarnock and Ayrshire Photographic Society.—November 17.—Mr. Maloni, photographer, Newmarket-street, Ayr, showed an exceedingly efficient simple, and portable apparatus, patented by himself, for taking photographs by artificial light. Mr. Mack Wilson described the method of using the light. Briefly stated, it is this: At the side of the person to be photographed is a brass stand adjustable to any height, and having arms adjustable to any height and angle, on which are supported several gas jets, behind each jet being a clockwork apparatus containing magnesium ribbon. The camera is put in position, and everything got ready for the plate being exposed. The operator then squeezes an indiarubber ball attached to the apparatus. This sets the clockwork apparatus in motion, causing the magnesium ribbon to be unwound and projected into the burning gas jets. While the magnesium ribbon is burning, the plate is exposed. When the pressure is taken away from the ball the clockwork apparatus stops, so that the exposure with the magnesium ribbon is entirely under the control of the operator. The exposure required is the same as in a studio in daylight. The light has not a blinding effect on the eyes as some forms of artificial light have. After the demonstration there was a limelight exhibition of lantern slides made by the members. Mr. Maloni showed slides made from negatives taken by artificial light, and likewise slides made from negatives taken in daylight, and the former could not be distinguished from the latter. Mr. Terras, 42, Sandgate, Ayr; Mr. Davidson, Glendoon, Ayr; Mr. Alfred J. Thomson, Ayr Academy; Rev. John Callan, Annbank; Mr. Dobbie, Laurel Bank, Ayr; Mr. Meikle, Woodside, Ayr; Mr. J. Lindsay Copland, Ayr; Mr. D. Boyd, Kilmaurs; Mr. T. Ferguson, Kilmarnock, and several amateurs, showed slides. At the close of the meeting the President intimated that at the next meeting, to be held in Kilmarnock on Saturday, December 15, Mr. Ferguson would show how to make lantern slides.

Dublin Y.M.C.A. Camera Club.—The annual *conversazione* of this Club took place on Thursday evening, the 22nd inst., in the Minor Hall of the Christian Union-buildings, which was tastefully decorated for the occasion with flags and evergreens, one side of the hall being set apart for an exhibition of members' prints, enlargements, &c. The exhibits were more numerous and of a better all-round quality than those displayed on previous occasions. After tea, part of a literary and musical programme was gone through, followed by a limelight exhibition of members' slides. An interval of fifteen minutes was allowed for refreshments, after which part of the programme was proceeded with, and another exhibition of slides given. Mr. T. H. Reilly (Vice-President) occupied the chair. Too much praise cannot be given to Mr. T. Shiels for the very efficient manner in which he carried out the arrangements in connexion with the hall and the placing of the exhibits, &c. Mr. L. Davidson and Mr. Charles E. Stewart manipulated the lantern with great success. Mr. F. N. Binks, who had charge of the musical portion of the programme, did his part to the satisfaction of the members and of the large company present. The following took part in the programme: Miss Stanford Campbell, Miss Dawson, Miss Hanna, Miss Hyland, Mr. Binks, Mr. Gerard B. Clarke, Mr. L. Davidson, Mr. Pierce L. Picton, and Mr. William Purdon. Prints and enlargements and lantern slides were sent in by the following members: Messrs. Binks, Paul Barber, W. Barnes, F. W. Groves Campbell, LL.D.; S. S. McCurry, G. W. Riky, T. Shiels, C. E. Stewart, F. Heatley, A. Campbell, W. A. Perrin, J. Stuttard, James Gordon, E. C. Matson, George M. Roche, Jacob Pierson, D. Hopkins, H. F. Elward, and A. Lawrence. The function was a most pronounced success, the company being highly pleased with the entertainment. Messrs. George A. Parnell and Henry J. McCormick are the Hon. Secretaries of the Club.

Photographic Society of Ireland.—November 22, Mr. J. H. Wordsworth in the chair.—There was a very large attendance of members and visitors, attracted by the announcement that a paper entitled *A Tour in Japan* would be given by Miss White. Miss WHITE showed a number of lantern slides of scenes in that interesting land, which were much admired. She subsequently exhibited some excellent slides of Irish views, and was followed by other members of the Society, including Messrs. V. E. Smith, J. White, F. H. Orr, Dr. Beater, and Mr. J. A. C. Ruthven, Hon. Secretary, whose cloud studies were admitted to be gems of the photographic art.

FORTHCOMING EXHIBITIONS.

1894.		
November 30	.....	Woolwich Photographic Society. Hon. Secretary, J. B. Panting, 3, Friar's-villas, Old Charlton.
,,	30, Dec. 1	*Leytonstone Photographic Society. F. W. Wates and G. H. Cricks, The Studio, High-road, Leytonstone.
,,	30, ,, 1	*South London Photographic Society. C. H. Oakden, 51, Melbourne-grove, East Dulwich, S.E.
,,	30, ,, 1	*Stanley Show (Photographic Section).
December 3, 4	.....	North Middlesex Photographic Society.
1895.		
March 25–30	.....	Brixton and Clapham Camera Club.

Those marked * have Open Classes.

News and Notes.

ON Wednesday, November 21, the Photographic Club held a very successful Smoking Concert under the direction of Mr. F. A. Bridge, who with Messrs. E. W. Parfitt, H. F. McConnell, A. Cowan, S. H. Fry, G. M. Kino, Snowden Ward, M. C. Gaze, C. Wallis, Bulbeck, and Welford, contributed to an enjoyable programme of vocal and instrumental music.

AT the Lantern Society, on Monday night, and before a very large audience, a Lantern Exhibition of many of the famous Polytechnic hand-painted slides was given by Mr. J. Hay Taylor. The Polytechnic lanterns were employed, and worked very smoothly under the care of Mr. Kœnig and an assistant. The slides, which were the work of Mr. Clare, Mr. Hill, and others, were much admired for their beauty of colouring. They depicted scenes on the Thames, in the Tower, Rhine Legends, and included some pretty effects, being described by Mr. Taylor in an excellent accompanying lecture. At the close of the Exhibition the Hon. Slingsby Bethell proposed a vote of thanks to Mr. Taylor.

PHOTOGRAPHERS' COPYRIGHT UNION.—The following circular has been issued by the Secretary of the Photographers' Copyright Union: "I am instructed by the Committee to ask your further support of the Photographers' Copyright Union. Since I last addressed you, a large amount of useful work has been done by the Committee, upwards of 1,000*l.* having been recovered by members in the shape of fees for the use of their copyrights, and penalties, mainly through this agency. They have been instrumental in securing a general recognition of photographers' copyright rights, and have also been the means of awakening many photographers to the value of their copyright photographs, and the profit which may be made from them. These most satisfactory results have only been obtained by the Committee at a very considerable expense, which they have defrayed themselves; but to successfully establish the rights of photographers in their copyrights, and to ensure a continuation of their success, it is imperative that a permanent organization with proper working funds be founded, as, in many cases where photographers sought legal redress for piracies, the Union was unable, for lack of funds, to proceed to extremities. It is strictly true that present members, when joining, were informed that their acceptance of the principles of the Union involved no monetary liability whatever. But, for the reasons as stated above, the Committee must now ask you to assist them in establishing the Union on a permanent footing, by paying a small membership subscription of, say, 10*s.* 6*d.* per annum. With such subscriptions, the donations already promised, and the fees accruing from work done, there is every prospect that an ample reserve fund would be assured. The advantages to members would be as follows:—Members whose work has been pirated would secure the services of the Union's solicitors to take up their cases (provided the same be considered good), and would, without expense to themselves, be entitled to two-thirds of the net proceeds of any compensation awarded, the other one-third of it going to the reserve fund of the Union. Should the action fail, half the expense thereof would be defrayed by the Union. In many, and probably in most, cases compensation would be obtained by the Union without litigation, and three-fourths of the sum so obtained would be handed over to the member without trouble or expense, the balance going to the reserve fund. The Committee have obtained the services of a solicitor thoroughly conversant with copyright law, who has proved himself to be most prudent and competent in the cases already carried out by him at the instigation of the Committee. The Committee propose to negotiate for any member the sale of copyright for reproduction by publishers, and from their experience they will probably obtain better terms for such than he would acting alone. In such cases there will be a small commission of 10 per cent. chargeable on the amount obtained, which shall be placed to reserve fund. The Union would also undertake the registration of any member's photographs. If this new departure of the Photographers' Copyright Union meets with the support which the Committee venture to think it deserves, it will greatly strengthen the power of individual members to obtain their just rights and increase the value of their copyrights. "The rules and members' form for signature may be obtained of Mr. Henry Gower, Secretary, Photographers' Copyright Union, London Chamber of Commerce, Botolph House, Eastcheap, E.C." List of donations to the reserve fund, received up to the present date:—Messrs. W. & D. Downey, London, 25*l.*; Messrs. Elliott & Fry, London, 25*l.*; Mr. J. Lafayette, Dublin, 25*l.*; Messrs. Marion & Co., London, 25*l.*; Autotype Company, 15*l.*; The London Stereoscopic Company, London, 15*l.*;

Messrs. Johnson & Sons, London, 10*l.* 10*s.*; Messrs. Johnson, Matthey, & Co., London, 10*l.* 10*s.*; Messrs. Ross & Co., London, 10*l.* 10*s.*; Messrs. Elliott & Son, Barnet, 10*l.* 10*s.*; Mr. W. Lawrence, Dublin, 10*l.*; Messrs. Mawson & Swan, Newcastle-on-Tyne, 10*l.*; Messrs. Pilkington Brothers, St. Helens, 10*l.*; Messrs. G. W. Wilson & Co., Aberdeen, 10*l.*; Messrs. Frith & Co. Reigate, 5*l.* 5*s.*; Messrs. A. & G. Taylor, London, 5*l.* 5*s.*; Mr. Barnett (Falk Studios), Sydney, N.S.W., 5*l.*; Messrs. Hazell, Watson, & Viney, London, 5*l.*; Mr. Alfred Ellis, London, 5*l.*; Messrs. Houghton & Sons, London, 5*l.*; Messrs. Mallin & Co., London, 5*l.*; Messrs. Maull & Fox, London, 5*l.*; Mr. Otto Scholzig, Clapham, 5*l.*; Messrs. Window & Grove, London, 5*l.*; Mr. G. W. Webster, Chester, 2*l.*; Mr. H. R. Yeo, Plymouth, 1*l.* 1*s.*; Mr. Thompson, Liverpool, 1*l.*

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

BLACKBALLING AT THE ROYAL.

To the EDITOR.

SIR,—Since the publication of the fact that Mr. A. Horsley Hinton was blackballed at the Royal Photographic Society it has been very freely surmised that the proposer, seconder, and supporters who signed Mr. Hinton's application will "of course" resign, and their names have been equally freely handed round. Whatever may be done by the other signatories, I have no intention of resigning. There is no question of injury done to us by the Society, but rather of a great and serious injury done to the Society by the action (surely capricious) of a few of its members.—I am, yours, &c.,

H. SNOWDEN WARD.

November 26, 1894.

To the EDITOR.

SIR,—Is Mr. Horsley Hinton quite wise in blazing around the fact that he was blackballed by the members of the Royal Photographic Society when seeking readmission to that body? I say "readmission," for it is well understood that he resigned his membership only some three years since. Some little has been said about the possible evil to the Society that may accrue from keeping Mr. Hinton out of its ranks. What did he do for it when he was a member? Is he put forward by other quondam malcontents as an experiment to test their chances of readmission now that the Society is in a more prosperous state than ever? Is the influence of the Queen's command that the Society shall henceforth be "The Royal" beginning to be felt? There are several of those who left the Society *en masse* whom I would like to see back again, and think this feeling is shared by many. Mr. Hinton, I believe, is, or is about to become, a professional photographer in a country town not far from London, and I can well sympathise with him in his desire to be able to put in his advertisements that he is a member of the Royal; but other considerations than the foregoing led me, at least, to be, Sir,

November 26, 1894. ONE OF THE BLACKBALLERS.

To the EDITOR.

SIR,—As Mr. Horsley Hinton has himself widely published the fact that he was "blackballed" at the last meeting of the Royal Photographic Society, one need have no delicacy in referring to the matter. Of course, the few members, something under two per cent., who were responsible for this act were within their literal right in doing as they did; but, so far as I am able to judge, this "blackballing" was a grave abuse of the secrecy of the ballot.

It may be some satisfaction to Mr. Hinton to know that, according to the rules of the Society, the proposal forms of candidates have to be passed by the Council before they are submitted to the meeting. As the Council passed Mr. Hinton's form, we may fairly assume that no member of Council voted against him, for one cannot imagine a gentleman giving an open vote in his favour and proceeding to register a secret vote against him. It is, of course, theoretically possible to assume that Mr. Horsley Hinton has done something that renders him unfit to be a member of the Society; but, in that case, those members who caused his exclusion ran a very great risk of allowing his election to take place. I think it was their duty to have taken care that the evil they knew was known also to the Council, so that, if necessary, this body might have saved the Society from incurring this risk. As they did not take such an obvious precaution, we can only suppose that there was no such evil, and that the "blackballing" was nothing more than the expression of a few persons' personal feelings, and therefore a gross abuse of the ballot.

I hope that Mr. Hinton will recognise the fact that the half-dozen or so who were instrumental in preventing his election do not represent the Society, and that it is at least probable that ninety-eight per cent. or more of the members would be glad to welcome him.—I am, yours, &c.,

11, *Eaton-rise, Ealing, November* 24, 1894. CHAPMAN JONES.

[We are sorry that Mr. Horsley Hinton failed to gain admission to the Royal Photographic Society, but he is fortunate in having secured the championship of its Honorary Secretary, to whom Mr. Hinton's thanks are due for the able manner in which he strives to minimise that gentleman's natural disappointment and annoyance. We have no doubt as well that the general body of members, besides Mr. Hinton, will be highly edified and consoled by Mr. Chapman Jones's information that the blackballing was effected by "something under two per cent. of the members;" but what has that to do with the case? It would be more interesting to know the percentage of blackballs to members voting. The election is only in the hands of members present at a meeting, as Mr. Chapman Jones should know, so that, much as we appreciate the charity of his percentage calculations, they do not bear on the question at all. We fail to see how the "secrecy of the ballot was abused." We always thought the ballot was employed to ensure secrecy in voting. What does Mr. Chapman Jones think it is for? We should also like to know the particular rule of the Society upon which he founds the dictum that it was the duty of members intending to blackball Mr. Hinton to tell the Council of what they meant to do. We do not know how "the half-dozen or so" (? more) "who were instrumental in preventing Mr. Hinton's election" will relish being told that they "do not represent the Society," that the blackballing was only "the expression of personal feeling" and "therefore a gross abuse of the ballot," or by what application of the magic art Mr. Chapman Jones knows all this, but we sincerely hope the members at large may not resent the action of their Honorary Secretary in publicly interfering in so delicate a matter as the blackballing of a candidate.—ED.]

LANTERN SLIDES.

To the EDITOR.

SIR,—Perhaps you will be kind enough to allow me to correct one or two mistakes in the report of my address to the Putney Society on the subject of "Lantern Slides." As I did not read from MS., and as during the greater portion of the time the reporter only had the light reflected from the screen to aid him in making his notes, he may fairly be excused.

I am reported as having said that "collodio-bromide and wet collodion were the most popular processes"—it is perhaps unnecessary to say that I gave that distinction not to either of those processes, but to gelatine. The report proceeds: "The albumen process was capable of giving the most beautiful results . . . . the great difficulty in working being to retain the film upon the glass." This observation referred to collodio-bromide, for, whatever other difficulties may be encountered in the albumen process, slipping of the film is certainly not one of them, and in this respect, in my limited experience, it has an advantage over most other processes.

My remarks as to the comparative quality of slides made by reduction and contact seem to have been rather misunderstood. What I intended to say was that, from a purely technical point of view, contact slides could be made of a quality indistinguishable from those made in the camera, and that, so far as *method* was concerned, it had no effect upon technique. I at one time held the contrary opinion, which I believe is still the popular one, but many comparative experiments have convinced me that I am right. Regarded from a *pictorial* point of view, there can be no doubt that the reduction method possesses advantages, assuming that the composition of the subject in the original negatives has been carefully studied; when, however, the negatives are small, 5×4 or quarter-plate, and the composition faulty, either from the inclusion of too large an angle of view or from one having chosen an unsuitable view point, a better result may often be obtained by selecting a small portion of the negative and printing by contact.

I am sorry to trouble you at this length; but, as lantern-slide making is my "pet" subject, I thought it desirable to make these corrections.—I am, yours, &c.,

JOHN A. HODGES.

87, *Chancery-lane, November* 23, 1894.

SPOTTY PRINTS.

To the EDITOR.

SIR,—I shall be greatly obliged if you will give me the benefit of your advice in a matter that has caused me a good deal of annoyance.

For some time past I have been troubled, at intervals, not regularly, with minute yellow spots that make their appearance on my prints after fixing, sometimes, though rarely, and only to a slight extent, during the process of fixing, but usually some time after the operation of washing

has proceeded. I was at first inclined to attribute them to some action of the alum bath, until I found they occurred just as badly when the alum was altogether dispensed with. Then I noticed that I got them in greater numbers with a certain brand of gelatino-chloride paper, indeed, frequently when working two kinds of paper together, one has shown a plentiful crop of the objectional spots, while the other has been quite free, and I laid the blame to some extent upon that particular paper. Now, however, I find they occur as badly or even worse with the albumenised paper, so that evidently it is not the gelatine that is to blame.

I may say that I live in a country town, and my supply of water, which is acquired from a well, is very bad and heavily charged with lime; but, as I usually make my fixing bath with water drawn from a very hot boiler, it is probable that a great portion of the lime salts are thrown down before the water is used. Can the cause be particles of iron from the boiler, or of lead from the pump?

I have tried to produce the spots artificially by soaking spoilt prints in hypo, and then dusting them with powdered chalk, iron rust, fine iron filings, and scrapings from the inside of the leaden spout of the pump, but these don't seem to produce any effect, and yet, in the ordinary course of working, the spots happen as usual.

Any suggestions you can make will be thankfully accepted by,—Yours, &c. "ANXIOUS."

[See an article in another column.—ED.]

THE EASTMAN COMPANY'S FILM.

To the EDITOR.

SIR,—There is a firm in London advertising Eastman's transparent film at a quarter the original prices. A few months ago we had a quantity of films and bromide paper damaged by sea water. These were abandoned to a marine insurance company. Some of this material may be good; but, for the benefit of the users of our products, we think it right to state the above facts.—We are, yours, &c.,

THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED
(GEORGE DICKMAN, *Managing Director*).

115, *Oxford-street, London, W., November* 21, 1894.

MORRIS *versus SCIENCE SIFTINGS.*

To the EDITOR.

SIR,—Referring to your comment on this case, we beg to draw your attention to an omission which is calculated to seriously damage us in the eyes of the public. Therefore, in common fairness, we trust you will draw attention to the matter in your next issue. The evidence of our witnesses showed conclusively that, although the plaintiff took the view that he had not received proper value, we, at least, were acting perfectly *bonâ fide*, as the person who supplied us with the six-guinea watch-chain presented to the plaintiff received from us full consideration for this sum. If, therefore, as it turned out, the chain was not of the value of six guineas, the fault lay with the vendor to us, we, at least, having dealt fairly by the plaintiff in the matter. We allowed this value for the chain, and accepted the vendor's representations that it was worth the money, otherwise we should not have defended the proceedings.

There was a contract produced in court between the vendor and ourselves, stipulating that the chain should be of the full value of six guineas, and we did everything that we could reasonably be expected to do to ensure it being of that value.—We are, yours, &c.,

THE PROPRIETORS OF *Science Siftings*.

125, *Fleet-street, London, E.C., November* 23, 1894.

MRS. "COSMOS" AND THE PHOTOGRAPHIC CLUB.

To the EDITOR.

SIR,—It is usually considered a very undesirable thing to offend "Mrs. Grundy," but a few members of the Photographic Club have apparently, by deciding not to invite ladies on their monthly Travellers' Nights, done a far more serious thing by offending the partner of the joys and sorrows of friend "Cosmos."

I hasten to modify, if possible, the indignation of that lady by assuring her that her sentiments are shared, not only by many ladies whose friends and relations are members of the Club, but also by many of the members themselves. I seconded Mr. Weir Brown's excellent suggestion, but there was really no necessity for the motion at all. There is nothing in the rules to prevent the introduction of lady visitors at any meeting, and, although their presence at the ordinary meetings might, perhaps, be neither desirable nor beneficial, these Travellers' Nights are special, and should be of as much interest to ladies as gentlemen. It is therefore to be hoped, in the interests of the Club, that this little slip will be rectified as soon as possible, and that, on our forthcoming Travellers' Nights, we may have the pleasure of welcoming a large contingent of the fair sex, who do not object to the fumes of the (more or less) fragrant weed.—I am, yours, &c., F. A. BRIDGE.

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—Will you kindly permit me, through the medium of your paper, to acquaint those concerned that the half-guinea annual subscription fee paid now by members of the Union, will hold good till January 1, 1896. By inserting this you will oblige.—I am, yours &c.,

HENRY GOWER, *Secretary*.

Botolph House, Eastcheap, November 26, 1894.

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITOR.

SIR,—Reading in your present issue, on page 746, the report sent you by the National Association of Professional Photographers, of their proceedings at the Council Meeting held at Anderton's Hotel, on the 9th inst, wherein a full account is given of the work done by that Association, I was struck by the following announcement:—

Mr. H. J. Whitlock (Birmingham), one of the Vice-Presidents of the Association, is the owner of the only photographic portrait of the late Lord Chief Justice Coleridge. This portrait (copyright) having been used without his permission, or even the civility of naming the matter to him first, Mr. Whitlock commenced legal proceedings against the proprietors of the *Illustrated News, Graphic*, &c., the result being a cash payment to Mr. Whitlock and the stay of proceedings.

I will not say what I think of the above, but will state briefly the real facts of the case.

The National Association of Professional Photographers had nothing whatever to do with the matter, and the Photographers Copyright Union, *at that time* having no funds available for taking up the case on behalf of Mr. Whitlock, that gentleman wrote urging me to negotiate for him with the proprietors of the *Illustrated London News* and the *Sketch* (not the *Graphic*, as erroneously stated in the report). I declined taking upon myself so unpleasant a task, and it was only on the repeated applications on the part of Mr. Whitlock that I eventually consented, with the result that, at a personal interview with Sir William Ingram and Mr. Clement Shorter, I succeeded in settling the matter without resorting to a lawsuit, and obtained Mr. Whitlock the "cash payment" above alluded to.

Comment is unnecessary!—I am, yours &c., JOSEPH J. ELLIOTT.

Talbotype Gallery, 55 and 56, Baker-street, W., November 27, 1894.

To the EDITOR.

SIR,—In your report of the transactions of the Association of Professional Photographers appearing in your JOURNAL of last week, there is mention made of a matter which concerns Mr. Harold Baker, of Birmingham, and our firm, and what is stated there makes us appear in a mean and ridiculous light. The report is not according to fact, it is half truth garbled. We wrote Mr. Harold Baker asking him if he was the author, he replied that he was not the author, and that, when he arrived in the room, the discussion on the matter was over.

We are accused of trifling about a very serious matter, and also when brought to book we very speedily altered our tone. The end of September last we received a letter from a firm of solicitors in Birmingham on behalf of Mr. Harold Baker. We did not reply to them, but wrote to Mr. Baker expressing surprise that he had not at first appealed to us, instead of rushing off to his lawyer's, also stated that we were not to be coerced by threats. To this came another peremptory epistle, threatening us with an injunction, and wanted the name and address of our solicitor. Before we sent our solicitor's address we thought it would be just as well to see Mr. Baker himself, and to find out the extent of his grievance, and if he really meant taking it into court; accordingly, one of our partners went down to Birmingham. The grievance was this: *One* mount with Mr. Baker's name on the back, and a photograph of the Duke and Duchess of York on the front (copy from one of Mr. Russell's prints), was brought to him by a gentleman who had bought it from a barrow man in Liverpool. This was the extent of the known grievance, not as stated in the lawyer's letter, "that they were being hawked about in barrows in this City" (that is Birmingham). We had ascertained that such a thing had not been seen in Birmingham. However, if only one, it was sufficiently grave to be taken very seriously, for there might have been more. We first asked Mr. Baker if he had determined to go to law. Mr. Baker had no desire to go to law, he only wanted the destruction of these cards if any existed. We readily promised to use our best endeavours to find out if any existed, and to buy them and to destroy them, and the matter was so settled, Mr. Baker reserving to himself the right of making any claim in case of any damage that might arise in the future. After all, it is but supposition that this mount came from us. It might just as well have come from Mr. Baker's, for there were a great many which were not returned. Assuming really that the mount was one of those returned to us, how was it possible to explain its appearance in public?

It is the custom of most large houses from time to time to sell to waste-paper dealers their accumulations of old paper, books, &c., and with us are added waste mounts, to be broken up and reconverted into paper. It is the custom of the waste-paper trade that this destruction should be carried out, and for years we have been in the habit of clearing out such wastes. Now, suppose this destruction is not carried out, there is a danger of printed mounts getting about. It is easy to be wise after the event; in future we have determined that every waste mount shall be destroyed by ourselves.

It being settled between us, Mr. Baker wished our partner to go with him to his lawyers; this was demurred to as being unnecessary, but Mr. Baker pressed it, and said it would not be courteous to them, and they were very good friends of his, and he particularly wished it. Our partner then said, "Very well." There was a good deal of talk in the lawyer's office, but no charge was made, excepting the lawyer asked our partner if he would be willing to put into writing the promise made to search for these mounts, and if any found, to buy them and to destroy them. Certainly there could be no objection. The lawyer kindly wrote the letter, which, after it had been curtailed of some additions not thought admissible by our partner, the letter was duly signed. We have no complaint to make of Mr. Harold Baker, he treated us with marked courtesy, but whether it was judicious on his part to rush off to his lawyer that is another matter. It cost both him and us some loss of time, and to us the expense of a journey to Birmingham and back. We think Mr. Baker will credit us with having fully carried out what we undertook to do. Up to the present, though diligent search has been made in London and every provincial town which his Royal Highness the Duke of York visited, not a single one of Mr. Baker's mounts has been found.—We are, yours &c., MARION & Co.

22 *and* 23, *Soho-square, London, November* 27, 1894.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

WELSHMAN.—So far as experience has yet gone, gelatine certainly cannot claim any greater permanence than albumen. Some say that gelatine prints are less stable than albumen ones.

W. OSBORNE.—We can hardly account for your difficulty unless the glasses were not perfectly clean. Overdrying the plates with the gelatines generally used for emulsions will scarcely account for the films peeling off when dry.

NEMO.—For photographing such things as flies, spiders, bugs, fleas, and the like, a small photographic lens, such as the old "postage-stamp lenses," if of good quality, will answer quite as well as, indeed better than, a microscopic objective.

T. J. M.—The best way for you to test the speeds of the two makes of plates is to expose one of each on the same subject, one immediately after the other, giving a short exposure, and then see which yields the most detail on their development.

WM. GOODWIN.—Probably the beeswax that has been used is impure—no uncommon thing with commercial wax. Try a sample from another source. The solution being somewhat turbid is of no importance so long as it is free from undissolved particles.

S. J.—As you cannot get the work or the negatives back, sue for the money paid and the value of the negatives in the County Court. Probably before the case comes on you will have the pictures and the negatives. If not, send us a report of the case when it is tried.

PROCESS.—We can say no more than was given in the paper; no practical details were given as to how the "wedding" was to be brought about. We await for the method which has been promised. Until then we can, of course, offer no opinion as to its value in every-day work.

A. B. C.—We cannot answer the question. It should be put to those gentlemen who "blackballed" the candidate. We cannot say the reason why different individuals have different opinions and ideas, mistaken or otherwise, and this, in the abstract, seems to be the gist of the query.

G. C. BREWER.—As retouching tries your eyes so greatly, and you have to do it, we should advise you to consult an oculist without delay. From what we gather from your letter, we suspect you are suffering from astigmatism. If so, a pair of spectacles, properly constructed, will prove a remedy, if not a cure.

W. A.—If the medium used is of the kind most generally employed, the retouching can be cleaned off with a pledget of cotton-wool charged with turpentine. If the work was not well done, the price paid for it certainly was not such as should command good work. The letter cannot be inserted.

E. A. J. (Yorks.).—A clear case of piracy. If you secured the copyright under the conditions mentioned, you can certainly restrain further publication and also sue for damage sustained. If there is any doubt about the validity of the copyright, you may depend upon it that the publication in question will take advantage of it if they can.

D. MACDONALD.—You are not the only one who has been disappointed in the returns made for the residues from gelatino-chloride paper. Your strictures on the makers for putting so little silver in it are not to the point. Their object is to supply paper to produce prints upon, not to recover residues from.

S. WALTHEW.—The reason for grinding the surface of the glass plates for collotype printing is not to obtain the grain; that is obtained in the colloid film. The object of a ground surface is to secure greater adhesion of the gelatine to the glass, and other minor advantages. The grain is produced in the gelatine coating, and it can be made coarser or finer at the will of an experienced operator, quite exclusively of the ground surface of the glass, whether that be fine or coarse.

BEMROSE & SONS.—So far as we can judge from the description, the proposed studio will serve its purpose. Of that, however, we should be better able to judge if we saw plans. As the studio is wanted for business purposes, and will be required to meet all circumstances and conditions, it might be worth your while to invoke the services of an expert who is conversant with requirements such as yours, as well as the processes to be worked. In all cases of this kind much may depend upon little surrounding circumstances, and conditions as to what may be the most advantageous in actual every-day working.

R. HANDLEY says: "In all the articles I have read on photographic etching of intaglio plates, the grain is obtained by dusting the copper plate over with powdered bitumen, and then heating it as was done in the old aquatint process of engraving. But other methods were then used to obtain grains of different characters. Would not these also do for photogravure?"—Yes; the process of photogravure by the etching method is closely allied to that of aquatint engraving, and the ground—the grain-producing one—that answers in the one case will answer equally as well as in the other. So long as a suitable grain is obtained, it matters little how.

T. RICHARDS says: "In compounding some collodion for the wet process according to an old manual, I could not get the whole of the iodide of potassium into solution. What I did was this: I dissolved the pyroxyline in the ether ·720 and half the alcohol ·805. In the other half of that I added the iodide of potassium and bromide of ammonium, after grinding them up in a mortar, but I could not get the whole into solution; but I poured the whole, undissolved and all, into the collodion, thinking that perhaps the undissolved portion would then be taken up, but it was not, and settled to the bottom of the bottle. What can I do?"—Iodide of potassium is but sparingly soluble in strong alcohol such as that used. The usual way when this salt is used is to dissolve it in alcohol of a s.g. ·830, and then add it to the collodion. By this procedure the difficulty will be avoided.

A RECRUIT IN THE PHOTOGRAPHIC ARMY writes: "In the report of the Photographic Club's meeting in your issue of October 26, a combined bath is given as follows: 'Hypo, 12 ounces; water, 16 ounces; gold (in two ounces), 15 grains; and add to hypo.' 1. Do these last words mean that the hypo is to be added to the water, and the gold dissolved in two ounces of water, gold solution to be added to hypo solution? 2. If a few prints were put into this bath, would they not consume more gold than they need do, allowing a grain of gold to a sheet of paper? 3. If, to avoid the waste of gold (query 2), the ingredients of the bath be quartered, viz., hypo, 3 ounces; water, 4 ounces; gold (half-ounce solution), $3\frac{3}{4}$ grains; then the amount of bath ($4\frac{1}{2}$ ounces) would only allow of a very few prints being toned, while, on the other hand, if an amount of solution be used, in which a decent number of prints could easily be moved about, the amount of gold (proportionate to the water, as per formula) contained in such solution would be enormous. 4. Does this bath fix the prints?"—1. The hypo should be dissolved in the sixteen ounces of water, and then the gold, dissolved in two ounces of water, added afterwards. 2. The prints are, of course, removed as soon as they have acquired the tone desired. 3. Of course, a smaller quantity of the solution can be made at a time, but the consumption of gold is in proportion to the tones obtained. 4. Yes. The formula quoted is one that was in very general use in the early days of photography, before the combined bath was abandoned, and when the paper was much more strongly sensitised than it is now. Then economy in the work was not such a consideration as it is now.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1805. Vol. XLI.—DECEMBER 7, 1894.

PIAZZI SMYTH'S CORRECTOR REDIVIVUS.

Were we to inquire what is the most noticeable fault to be found with lantern pictures seen projected on the screens at eight-tenths of the miscellaneous Exhibitions, private and public, the answer would, doubtless, be, The want of sharpness at the margin of the disc.

It is only a few years since the great importance of ameliorating this evil engaged the attention of the practical optician, and the good effect of this is seen when a lantern is fitted with a lens well corrected for flatness. But the great majority of objectives in use in the household lantern are of the French portrait class, and these, with very few exceptions, while giving good enough definition on the centre of the disc, give an image painfully indistinct as it approaches the margin, while, when by focussing so as to get marginal sharpness, the centre then becomes as indistinct as the sides previously were.

It was a similar condition of things to this when, as applied to the taking of a negative quarter-plate size, any attempt to do so by a rapid portrait lens worked without any diaphragm was made—it was, we say, this marginal want of critical sharpness that led the then Astronomer Royal for Scotland, Prof. Piazzi Smyth, to formulate means by which this could be avoided.

His idea was to so lengthen the oblique pencils of a lens having a round field as to eventually render the whole field flat, and the corrector he employed for this purpose consisted of a rather thick plate of glass the size of the sensitive plate, one side, that towards the front, being ground to a hollow or concave curve, the other side being flat. This was mounted in front of and as close to the sensitive plate as possible.

The action of this corrector is as follows:—The axial rays from the lens fall upon its centre where it is very thin, and, although the convergence is affected, it is only so in a slight degree, and the rays come to a focus upon the plane of representation. But at the margin the rays have to pass through a considerable body of glass, which they do in a degree more nearly approaching parallelism than previous to their entrance, and, upon emerging from the flat surface, they have still to travel a little farther before being brought to a focus on the sensitive plate. As the curved surface of this corrector stands so nearly normal to the rays, there is scarcely any loss from oblique incidence, while there is a very decided gain in rapidity in consequence of the large aperture that can be given to the lens.

This corrector was introduced in the days when wet collodion was the most sensitive surface that was obtainable, and when every conceivable expedient had to be resorted to in order to obtain instantaneous pictures; but, since the advent of gelatine dry plates, a high degree of instantaneity may be obtained with lenses working with a much smaller aperture than formerly, and hence, for the purpose originally intended, the corrector fell into disuse.

But it has been resuscitated this time for a different, although equally useful, purpose. It occurred to Messrs. Swift & Son, opticians, Tottenham Court-road, that in the now discarded corrector was to be found the very thing that, with these round-field lantern objectives of which we have spoken, would flatten the field of delineation, and thus give a disc covered sharply to the edge. This firm accordingly subjected the idea to practice, and find that it quite fulfils their anticipations.

Their lantern corrector is a square plano-concave lens, measuring about an eighth of an inch larger than the standarp size of a transparency. This square lens or corrector is made of colourless glass, and is highly polished. It is fixed upon or let into the wooden slide adapter in front of the orifice through which the picture is shown, and, of course, the flat side as near as convenient to the slide, which must not, however, be allowed to touch it.

The one we have under examination has a negative focus of about 35 inches, and, as its thickness at the corners is only a quarter of an inch, it will be seen that it does not add much to the thickness of the adapter.

We consider that, by this adaptation of Piazzi Smyth's corrector for lantern purposes, the Messrs. Swift have placed all lantern-users under obligations to them.

A FORGOTTEN PROCESS.

The title of the lecture recently delivered before the Polytechnic Photographic Institution by Mr. Howard Farmer suggests that that gentleman was scarcely prepared to treat the subject he dealt with in a serious manner, and the absence of any proofs of the utility of the process described tends to confirm the original idea. The so-called "wedding" appears to us to be an illegal or bigamous one, as we shall endeavour to show, for the "highly sensitive gentleman," "Mr. Bromide of Silver," is already in a position to preclude the possibility of

his requiring the marital aid of "Miss Bichromate of Potash." As a matter of fact, Mr. Farmer appears to have forgotten a process which altogether does away with his suggested "marriage."

Briefly, Mr. Farmer's process consists in treating a developed gelatino-bromide image with bichromate of potash, the result of which is to bring about the insolubility of the gelatine in those portions of the film where the light has already acted, just in the same manner as would occur—though after a much longer exposure—if the gelatine had been bichromatised before exposure. We have heard of something of this sort some years ago; a very rapid process for the production of typographic blocks was said to be based upon this principle, but the deeper the matter was investigated the stronger was the evidence that it was only a blind to hide the fact that a then-existing patent was being utilised. Mr. Farmer's explanation of the reaction supposed to occur is scarcely a satisfactory one, as he ascribes it to the action of "nascent silver" upon the bichromate liberating oxide of chromium, which in turn combines with the gelatine and renders it insoluble. "Nascent silver" is a rather strange term to apply to the developed image; we can understand nascent hydrogen or oxygen when the gases are in the state of evolution. We will admit that silver is in the nascent state while development is proceeding, and when it is in the act of decomposition or reduction, but that it is "nascent" after development is finished we strongly deny. If the silver, as *reduced* silver, exercises the action claimed in conjunction with bichromate, then the introduction of a silver spoon into a mass of bichromatised gelatine should bring about coagulation or insolubility.

However, to go back as far as 1881; in April of that year Mr. Leon Warnerke took out a patent for a process which was applicable to precisely the same purposes as those for which the "wedding" process is recommended, the only difference between the two being that the aid of bichromate of potash was not required. In other words, Mr. Warnerke claimed that the action of light and *development* brought about the insoluble condition of the gelatine that Mr. Farmer ascribes to the subsequent use of bichromate. That Mr. Warnerke's claim was correct there is plenty of evidence to prove, as specimens of the work were shown at more than one of the Society's meetings at the time. If, then, development suffices to render the gelatine insoluble in those portions of the film where an image exists, where is the value of the suggested wedding?

We have not the complete specification of Mr. Warnerke's patent before us, but from the official abstract we may briefly summarise it. The film is composed of a colloidal substance, such as gelatine, dextrine, &c., and the sensitive salt may be produced by the emulsion or bath process. The development is to be performed preferably with pyro and ammonia. Speaking from recollection, we believe that ferrous oxalate was not found to answer so well, but whether it was altogether useless we do not recollect. This is rather important, as Mr. Farmer specially recommends ferrous oxalate. Beyond this there was no special precaution necessary, except the avoidance of the use of any substances, such as alum, calculated to exercise a hardening or insolubilising action on the gelatine.

The sensitive film was to be spread upon paper or other suitable material, and, after development, to be dried with or without fixing, after which it was, to use Mr. Warnerke's own words, to be treated exactly as an ordinary carbon print—that is, squeegeed on to glass or other suitable support, treated with hot water, the original paper support taken away, and, in fact, the whole of the soluble gelatine removed, leaving the image alone *in situ*. Amongst the purposes for which Mr. Warnerke claimed his process to be useful were enlargements on paper or canvas—for which purpose permanent pigments might be combined with the emulsion—relief *clichés* for printing surfaces, phototype printing, ceramic photographs, transparencies, and others.

We have seen many of Mr. Warnerke's productions from specially prepared emulsions, and we have ourselves made many experimental specimens from commercial and other plates and films, and are in a position to answer for the correctness of the claim that, under the combined action of light and development, the gelatine surrounding the reduced silver that forms the image becomes insoluble, while, when there is no deposit, it remains soluble. This being the case, it is difficult to imagine why bichromate of potash should be introduced.

It will be noted that, while Mr. Warnerke gave the preference in development to pyro, Mr. Farmer speaks of ferrous oxalate. It is scarcely to be supposed, especially in view of the general hardening action of iron salts on gelatine, that ferrous oxalate would fail in producing the insolubilising action that pyro brings about; but, if such should prove to be the case, then we can only say: Substitute pyro for ferrous oxalate and dispense with bichromate—unless, indeed, which has not yet been shown, some special advantage is to be derived from the use of the latter salt.

A word or two may be said on the practicability of this process after its theoretical principles have been mastered. According to Mr. Farmer's lecture, if we want a typographic block of the Lord Mayor's Show, we have nothing to do but take an instantaneous negative, develop it, treat it with bichromate and afterwards hot water, and, *presto!* "we have our film for etching." Scarcely. It is quite possible, when the matter is reduced to the terms of Warnerke's patent, that films may be specially prepared which, after exposure and development, are ready for transfer to suitable etching surfaces; but with the ordinary commercial films and plates in present use the method is hopelessly useless, for the simple reason that the gelatine employed in such films is already partially, and in many cases wholly, insoluble, even before exposure.

In his lecture Mr. Farmer treats of the gelatine film as being perfectly soluble. The gelatine, "being in its ordinary state," dissolves in hot water; but any one who has tried to clean off a number of spoilt negatives will be able to judge how far this is true, for nothing short of violent mechanical means will remove the ordinary modern film after development. But even previous to development with the gelatine truly in its "ordinary" condition, that is, before it has been subjected to any possible action of light, development, or bichromate, the films of to-day possess anything but the easy solubility of a carbon print—in fact, some are absolutely capable of resisting boiling water, owing to the free use of alum and other hardening agents in the process of preparation.

It is perfectly evident that, under such conditions, the ordinary conditions of commercial plates and films, no useful application of either Mr. Warnerke's or Mr. Farmer's methods can be expected, and therefore we would warn our experimental readers to be careful not to condemn either plan because they do not succeed at the outset. The conditions requisite to success are a perfectly soluble gelatine, such as Nelson's No. 1, and total abstinence of alum or any other hardening agent during the preparation or treatment of the

films. In this connexion it may be judicious even to abstain from the employment of sulphite in the developer, which, in the case of pyro, will not prove a very serious matter, as any yellowness that may appear will be removed with the soluble gelatine.

Mr. Farmer has stated in the course of his lecture that it does not matter whether the image is formed by development or printing out, the alleged insolubilising action of the bichromate is the same. An experience of our own but a few weeks back will tend to corroborate this, leaving out the question of the bichromate altogether. We had some specially prepared emulsion paper, containing only chloride and carbonate of silver, and made from absolutely soluble gelatine, namely, Nelson's No. 1. A portion of this paper was left in a partly opened drawer, and a feeble light had acted upon it for some days, causing considerable discolouration, which, however, was not considered of importance, as the paper was not required for either printing out or development, but merely for treatment in the same manner as carbon tissue.

For this latter purpose, however, it proved useless, and we could develop no image on it owing to the general insolubility of the film, which we for some time attributed to the slow drying of the paper after bichromatising. On trying a portion, however, that had not touched bichromate, we found that the discoloured parts were more or less insoluble except in the hottest water, while those that had not been touched by light retained their original solubility, showing that the reduction of the silver had had a corresponding effect on the gelatine.

Litmus and Other "Indicators."—Of late years it has been the fashion to decry the use of litmus in favour of the more recent indicators—phenol-phthaleine, methyl-orange, and so on; but, according to Herr Reinitzer, in an article extending over several consecutive numbers of the *Chemical News*, this predilection is unjustifiable; so far is litmus, he says, from being a comparatively feeble indicator, that it is the most sensitive of all, the only way in which he guards this utterance being his statement that it is simply a question of doing the work in a proper manner.

National Association of Professional Photographers.—This Association must not be confounded with the Photographers' Copyright Union, referred to elsewhere. It was started a few years ago to do, amongst other things, pretty much what the Union now proposes to do, but never did it. Indeed, it has little to show for its existence beyond proposals, reasons afterwards why they were not carried out, making complaints generally, and against manufacturers and dealers in particular. It was proposed to form a co-operative association to combat them, and, as might have been expected, the idea has been abandoned. At the last meeting of the Committee, however, it seemed to claim having achieved something, as well as being the means of settling two disputes, but, from a couple of letters in our last issue, it appears that they had nothing to do in the matter. It will not conduce to the prosperity of any society to lay claim to things that it has not accomplished.

Completion of the New Edition of Watts' Dictionary of Chemistry.—The completion of this marvellous compendium of Chemistry by the publication of Vol. IV. places within the reach of the scientific photographer a complete though epitomised or brief record of all the chemical substances he can make use of, except some of the more recently discovered developers which have been brought into notice since the various volumes were completed. The last volume is of especial interest to photographers, containing, as it does, those particular elements and their compounds which form the staple requirements of photographic technology. Photographic chemistry falls to the pen of Professor Meldola, and the very latest developers of the amido-phenol class and their derivatives are referred to. The bibliography of photographic chemistry is remarkably small, eight authors only being referred to, yet the author states that, practically, all that is known of photographic chemistry is contained in their own works as named. Sulphur, silver, and platinum are dealt with by Professor Muir.

Painted Lantern Slides.—Those who had the opportunity of seeing, at the Lantern Society's meeting last week, the old Polytechnic slides, shown by Mr. J. Hay Taylor, could not but be struck with the exceeding purity and brilliance of the colours as compared with the coloured slides of the present day—those supplied commercially. The old slides were the work of skilled artists, who painted direct upon the bare glass, whereas the modern slides are, as a rule, painted upon a photographic basis, and that, of course, shows through the colours. Thus, for example, green applied to trees or grass, however pure it may be, can only show as green *plus* the colour of the photograph, whatever that may be. It is true that the skilful artist sometimes scrapes away or reduces the denser parts of the photograph, but that only ameliorates the difficulty and does not remove it: besides, it requires great skill to carry it out, and that is not to be had for the price now generally paid for coloured lantern slides. Ten to fifteen pounds was a common price for painting the old Polytechnic pictures, and that amount secured the excellence shown in the work.

New Societies and Clubs.—As the list in the *Almanac* shows, photographic societies continue to increase and multiply, not always advantageously to themselves. Instead of two or more societies in a small place, one good one would be far better, and more practically useful. Yet new ones are springing up like mushrooms, and often similarly die off. The Central Club is a case in point, that is, if the rumour be true that it will terminate its existence at the end of the year. No photographic association was ever launched with greater pretensions, or with greater promised membership, than this. Some of its active promoters were sanguine enough to surmise that it would at once, without even consulting those concerned, absorb those old-established institutions, the Photographic Club and the London and Provincial Association, and next the Royal Photographic Society. Yet the first year is sufficient for its demise, while the old-established associations continue the even tenour of their ways. Had those who joined the new affair joined one or other of the established ones, supposing they were not already members, it would have been a mutual benefit to all parties. This would also be the case in small towns where more than one Society has been promoted.

Cellulose and Nitro-Cellulose.—Any discussion on the latter substance, since its gradual disuse among the large majority of photographers, will fail to rouse much enthusiasm, though no long time ago there was scarcely a week that passed without some notice of its qualities or its work. Still, many will yet be interested in the researches of Mr. Clayton Beadle on the hygroscopic characters of nitro-cellulose. This is an important matter in collodion-making, and some of our readers will be surprised to find that the various samples experimented with absorbed from about one and a half to nearly six per cent. Taking four per cent. as an average, it will mean that such nitro-cellulose, if of the character of pyroxyline, would introduce for every ounce of cotton one-third of a drachm of water, enough to influence the mechanical quality of the resulting collodion unless very dry ether and alcohol were used. The author suggests that the varied amounts of moisture absorbed are dependent upon the extent of the nitrification. This, of course, may be the case, but it is worthy of note that cotton-wool itself, which is nearly pure cellulose, will absorb from the air, even if kept in a moderately warm place, a very notable amount of moisture. Indeed, to such an extent does this hold good, that it may be stated as a fact that the best and most uniform batches of pyroxyline can only

be made if the cotton-wool be first highly dried by heat, so as to ensure the mixed acids from a dilution by water that would alter the character of the finished product to a very material extent.

Fading Photographs at Exhibitions.—As announced last week, it is intended to hold a Photographic Exhibition in the United Kingdom Section of the Imperial Institute, South Kensington, during the summer season of next year. As this Exhibition is to remain open much longer than exhibitions usually do, it will be desirable that attention be paid to the methods by which the pictures are made. As the Exhibition is to include illustrations of early processes, it would be a reproach to modern photography if recent prints evince signs of fading, while others in the same show, thirty or forty years old, are still intact. Photographs that were good at first and show unmistakable signs of fading at the close of a few months' exhibition are not things unknown. At a recent meeting of the Photographic Club, some prints by a well-known professional photographer on gelatine paper were shown that were in a sorry plight, although they were from negatives taken during the last Photographic Convention, and could not have been made so long as this Exhibition will probably be open. It is to be hoped, for the credit of present-day photography, that such prints as those will not be sent to the Imperial Institute. By the way, as there seems to be an idea just now to standardise so many things in connexion with photography, might it not be advisable to consider what should be the standard life of a print? Some appear to have the idea that, if a print lasts for a year or so unchanged, it should be considered permanent, and the process by which it was made a reliable one.

Photographers' Copyright Union.—The circular issued by the Union, which will be found in our last issue, should be well considered by professional photographers whether they do a publication business or not. The most frequent queries we have to reply to in the "Answers" column are in connexion with copyright law, and how proceedings should be taken for its infringement generally by the illustrated press. In the majority of cases the photographer with limited means does not care to risk a law-suit against a wealthy journal. Even if he did, he usually does so at a disadvantage, inasmuch as the latter always have the services of a solicitor who makes a speciality of copyright law, while the photographer usually has to rely upon a local man who knows very little of the subject. Now the advantages set forth by the Union are that the members will have the services of a solicitor well versed in the law of copyright. The Union will also undertake the prosecution, in any good case, and if successful will take a share of the amount recovered, and if not successful it will bear half the expenses. But it anticipates that in the majority of cases compensation will be obtained without litigation, and we think so too, for in most instances where determination has been shown, compensation has quickly followed. The Union also proposes to undertake the sale of copyrights, as well as their registration. Such a society as this should be of immense advantage to the profession, and the terms of membership are but half a guinea a year. We wish the Union the success it deserves.

Photographic Action at Low Temperatures.—We have before brought before our readers the result of researches on this subject, which went to prove that photographic action took place at temperatures which completely prevented all chemical action, a result which would have been ascertained by one of the disputants in the old quarrels as to whether the results of light action in a film were "chemical" or "mechanical"—a distinction which, at the present time, does not necessarily mean a difference. Professor Dewar, F.R.S., at a meeting of the Chemical Society, lately gave the results of his investigations in this direction. A number of photographs have been taken at temperatures of −180°, using various sensitive plates and films, and these have been compared with similar photographs taken at the same time under similar conditions at the ordinary temperature. "The photographs have been examined by Captain Abney, who reports that the photographic action has been reduced by eighty per cent. at the temperature of −180°. If the photographic action is brought about by a chemical change, then it appears to be the only one that can be traced under such conditions, as substances having the most powerful affinity have no action on each other, and all voltaic combinations cease to give a current at such low temperatures. It is certain that the Eastman film, cooled to −200° by the evaporation of air *in vacuo*, is still fairly sensitive to photographic action. Much further work, however, will be required to reach a definite conclusion as to what is taking place when substances sensitive to photographic action are subjected to such conditions of temperature."

ARE LOCAL PHOTOGRAPHIC SOCIETIES OF ANY USE?

The question is so frequently raised as to whether membership in local photographic societies is any good; further, if so, in what way, that a few lines respecting some of the advantages which accrue to those who participate in the evening meetings now being once more held at short and regular intervals by some two hundred British societies may be serviceable and interesting.

I will not dwell upon the more obvious and more important set opportunities for the acquirement of photographic knowledge, or the promulgation of new ideas and inventions which the provincial societies afford, because such are amongst their evident functions and valuable points of attraction in their ordinary routine; to this category, for example, belong technical demonstrations of new or difficult procedures; the exhibition and criticism of lantern-slide work, and of prints; the occasional insistence of the value of art as a groundwork on which to build up successful pictures; the continued emphasisation of the need for a sound substratum of accurate knowledge of the elements of chemistry and optics, and so forth. But I meant to point out that it is, after all, to many photographers, exceedingly useful that they should have the opportunity of comparing notes upon matters of current interest—matters which may, by many, be considered slightly puerile. It is by these last forgotten that the road to distinction lies entirely through quite a thicket of details. Over and over again have thinkers and writers enunciated that genius, primarily, consists in a capacity to tackle trifles. However true this may be in the ordinary affairs of the world at large, it is doubly or trebly amongst the fraternity of photographers, of which assertion most will agree when they remember how often but a hair's breadth has divided their photographic achievements—or those of other workers—from ranking with the most noteworthy and brilliant productions of the camera.

It is, of course, the knowledge of this which explains why week after week throughout the winter, amateurs and professionals foregather to listen, see, and discuss. None the less, a large proportion of those who are not members of societies, do not appreciate to what a great extent, even in societies which are of moderate dimensions, intelligence upon important trifles is given and taken. Just to illustrate which, I will briefly summarise the information elicited during a recent ordinary meeting of the Croydon Camera Club; the occasion was an informal gathering held just before the regular winter course is inaugurated, and does not therefore represent anything like the high tide of photographic activity.

I need hardly explain that what follows includes nothing of any great novelty, but is only given as an object-lesson of one kind of service which a society may render to those of its members who attend its *séances*. To commence with, prints in large numbers were handed round and discussed: (*a*) from the art point of view; (*b*) from the technical; (*c*) from the topographical. Many were the conversational remarks and suggestions forthcoming, chief interest centering upon the cause of flare spots which marred one or two of the prints. The unsatisfactory behaviour of certain kinds of plates when developed was referred to. At first, over-exposure was considered the cause; eventually it was concluded that the fogging was due to using ultra-rapid plates which had been exposed to damp (seaside lodgings) and had hence deteriorated; various experiences bearing upon this tendency to deteriorate were recounted; also various means for guarding against the evil effects of atmosphere highly charged with saline vapour; in connexion with atmosphere, one member, carrying the old-pattern wooden double dark slides, found that the strip forming the hinge had on one occasion, when a sea trip was made, absorbed moisture, which, passing through the material, had condensed upon the sensitised film, and produced on

development a band about half an inch wide across the centre of several of the plates: and this member related the case of one who had painted with white pigment numbers on the insides of the slides of his dark backs, so that, on opening them in the dark room, the contained plates might be at once identified; the result was that he invariably got an image of one of the figures upon his negative.

The comparative value of various plates was, of course, discussed. Is there ever any meeting of photographers where this is not done? On this particular occasion the feeling was in favour of using the slower plates, an opinion shared in by a member who had made no less than 400 negatives within three months, more than half of which were on the quickest attainable. It was pointed out that many plates disappointed their users because the latter were not skilful in handling them, nor acquainted with their idiosyncrasies. One member recounted how, using a named plate, he was ordered to photograph an object in a studio, giving an exposure of a fixed duration; he was not a beginner, but the plate was new to him. Four times did he expose and develop, each time only obtaining a negative thin as gossamer. In despair, he went down to his superior, saying that the plates were no good. The latter, however, knowing better, stepped up, made an identically similar exposure, used the same developer (pyro-ammonia), and with ease produced a magnificently plucky negative. Those who were present will bear me out that this is not "journalese," but the bare fact as related by one whose name is world-renowned amongst photographers.

Another fruitful subject was that of pinholes. The battle was fiercely fought as to whether the fault lay with the plate-maker or the photographer. The *pros* and *cons* are too many to touch on; bubbles, dust, dirty water—all had their advocates, whilst others declared that particular brands of plates were more prone than others to the irritating blemish. One went so far as to examine in daylight six of a particular box which had given large crops of pinholes, and found that between film and glass there was a sprinkling of fine granular matter, to which he attributed his troubles.

Next a talk upon systems of dark-room ventilation led to conversation on systems of lighting; the use of red, orange, yellow, and green media was touched on; the merits of glass and paper compared; various cases of light fog were recounted. The question of red light injuriously affecting brain or eyesight was next adverted to. One member worked in such a dim red light that it used to take him half an hour to be able to see in it, after which he frequently stayed at work for two or more hours. He had never noticed the slightest ill effect upon his normal powers of vision, or upon his mental serenity, by reason of this red influence. The possibility of coloured light affecting living organisms was illustrated by the remarkable benefit claimed by a local horticulturalist in growing flowers in a greenhouse of blue glass.

The erratic behaviour of a certain make of camera was described by a member; others who had experience corroborated the aforesaid's contention that it needed to be improved before being considered reliable. Next shutters came in for criticism, in connexion with which it was pointed out that with many patterns a supplementary screen or cover is called for, especially when the photographer is accustomed to draw out the slide from dark back, and await for a considerable time for an opportunity to give an exposure. Other topics were those of halation and various antidotes thereto. In addition to which a comparison of experiences upon many matters, the exact points of which escaped me, were indulged in, including such topics as toning for various desired colours, the merits of neighbourhoods as regards scenic attraction, and much more of the like character.

There exist, of course, wiseacres whose cup of photographic knowledge is filled to the brim, and who not only know all that has been, but also all that will be, discovered. To these a photographic society is superfluous. But, to the tens of thousands of those living in various parts of the kingdom, I contend that the opportunity of freely and fully comparing notes at such a meeting as the one above sketched is of very great value. Only those who are continually coming in contact with the photographic freshman can be aware of the blundering that man is capable of; only those who mix freely with photographers who are outside the pale of a society can conceive the stupendous ignorance abroad, amongst those who earn their bread-and-cheese with a camera, an ignorance which a society will, to be sure, not in all cases enlighten, but which it will infallibly make the ignoramus himself aware of. The kind of thing I refer to I could easily prove by producing several professionals as shocking examples. It is no exaggeration to say that some among these, should their camera and lens be broken or lost, would for a long while not be able to produce a negative, especially if they depended upon one of the newer and more complicated pieces of apparatus, for they work entirly by thumb rule, using one lens, one stop, and one plate, in one particular studio for any number of years, and producing always one tolerably poor result. Alter the focal length of lens, add an iris diaphragm for this species of life-long professional to play with, and he will be completely mystified.

Of course, the technical press is always available to those who lack knowledge; but, although many take in journals, they either will not or cannot drink in any of the constant stream of instruction and information which is thus provided. Speak to a man, show him, and he will understand, will appreciate the force of very much which, put before him in type, will often elude his mental grasp.

Besides which, there are many items of information which no editor, be he even hydra-headed, can speak about from direct personal experience, the only kind which is, as a rule, worth much. For instance, an editor may spend—if he be lucky—three months in the field with a particular hand camera and tell us all about its good and bad points; but what can he tell, except repeat hearsay, concerning the other hundred or so in the market? Even if he really knew, it would demand a man of doughty pluck to earmark with type what he considers grave defects of design or construction.

But in clubs or societies, where individuals are, as a rule, personally known to each other, an almost brutal frankness respecting the merits of apparatus and materials prevails, and, if at times information tendered is based upon ill-considered or clumsy experiment, it is generally quite unbiassed; and, though on occasion it is like Sam Weller's knowledge of London, "peculiar," it is no less "extensive."

HECTOR MACLEAN.

THE AMOUNT OF SILVER CONTAINED IN SILVER PRINTS.

NOTICING in your correspondence column a discussion relative to the amount of silver contained in finished silver prints, the following, as bearing on the subject, may be interesting. Some years ago, the late Mr. Bedford made a series of experiments relative to the matter, especially to ascertain what should be a fair estimate of the quantity of residues to be recovered from all sources during the year, and also incidentally the amount of metal taken up by each sheet of paper. The conditions being as follows: The silver bath was sixty grains to the ounce of water, with no other admixture; time of floating the paper three to three and a half minutes; it was then *slowly* drawn over a glass rod fixed at the end of the sensitising tray to remove most of the surface fluid, then hung to dry, any drip being caught by absorbent matter in a tray placed beneath.

Three days' sensitising was selected as sufficient in quantity to give a fair average result. The washing water, nitrates, toning solution, and fixing bath were precipitated, and the precipitate collected and dried; the waste cuttings from prints burned and added thereto—in fact, every scrap of paper was accounted for. It was found that each sheet took up twenty-seven and a half grains barely of silver nitrate, and seventy-five per cent. of the metal used was recovered from the waste, leaving twenty-five per cent. of silver used in the sheet of finished pictures; and, as each sheet took up twenty-seven and a half grains, it left about *seven grains* to form the picture, not half a grain. This estimate was tested against the whole produce of residues for the year, several times repeated, with the result that with ordinary work there was a loss of five per cent., as the recovery from the waste was only seventy per cent. At the same time it checked and corroborated the estimates made specially in the first instance.

Although this small quantity of metal is found to remain in the finished photograph, the excess used has contributed to the formation of *one or more* organic substances without actually becoming (or in a very small degree) part of them, and that can be *dyed* by the application of gold chloride in the form of toning bath, the reduced silver itself being gilded, so to say, in contradistinction to the dyeing which the other portion of the image undergoes.

EDWARD DUNMORE.

STUDIO-LIGHTING AND ITS DIFFICULTIES.

[Autotype Notes.]

IN my last chapter *papier minéral* was referred to several times. Of course it is known to many of my readers, but possibly it may not be familiar to all. It is a French tracing paper, and has one great advantage over the English preparations of a similar kind; it does not so readily turn yellow with age. Of course all paper, particu-

larly tissue paper, turns yellow when exposed for any length of time to strong sunlight, even when there is no preparation whatever beyond the ordinary sizing solution employed at the time of its manufacture. This *papier minéral* is sold in rolls of considerable length, and cannot be bought, I believe, in small quantities. It will be useful, therefore, to many to know how to prepare an exceedingly good substitute. Take some ordinary vaseline and thin it down with paraffin oil, employing sufficient heat to induce it to mix thoroughly; when it is about the consistency of linseed oil it will be about right for use. Of course, great care is necessary when heat is employed, for the paraffin oil is very volatile when the temperature is raised considerably, and the vapour readily takes fire. If tissue paper is pasted on to a light wooden frame, the operation of making it transparent is a very simple one. Put some old newspapers on the floor, and lay the frame down with the tissue paper next the floor, and by the aid of a sponge spread the paraffin solution all over. When the preparation is first applied, the tissue paper is extremely transparent—in fact, too much so—but after a time a considerable portion of the paraffin evaporates, and then the surface is beautifully even and semi-transparent. Indeed, it exactly resembles the *papier minéral*.

I was led to this experiment under circumstances worth describing. Some time ago I was asked to help a photographer residing in the country, who was in despair over difficulties attendant on the management of the light of his studio. When I arrived and saw his place, I was not at all surprised at the fix he was in, for the studio was all but unmanageable. It was built in a yard surrounded by buildings. The tallest was of red brick and exactly opposite his available light. The glass roof of the studio sloped to the north and had a steep pitch, and came down so low that the side light was quite limited in area. When I took my place in the spot usually occupied by the sitter, I found there was no sky visible, except immediately overhead.

The photographer explained to me that, do what he would in the ordinary way, the eyes came out as caverns with no light in them. His method of getting over the difficulty was original if not artistic. He used a large swing glass, and placed it on the shadow side of the sitter, and turned it at such an angle that light was thrown into the pupil *on the shadow side*. Need I describe the effect? There was an uncanny glitter in the eyes that was simply awful. May I never look upon the like again. I proceeded at once to stop out the light immediately overhead; but then came the great difficulty, there was no direct light to illuminate the sitter. This was bad enough on a cloudy, grey day, but far worse when the sun shone, for then a blaze of red light was reflected from the sun-illuminated red brick building, with an occasional image of the sun himself thrown in from the glass of the windows opposite with most dazzling effect. A carpenter was called in to make two light frames sufficiently large to admit all the light necessary. These were made to run in grooves, and were covered with tissue paper and treated with the preparation described above, for no *papier minéral* was to be procured in the town, and time was most important. When all was ready for an experiment, a sitter was posed and a negative taken. It is scarcely necessary to say that the swing looking-glass was not employed, though I must state that the photographer was not happy at its rejection. His breath, however, was completely taken away when I gave about one-fourth the exposure he had been accustomed to employ.

It is only right to say that the new arrangement of the studio had not made all this difference in the time of the exposure. I rejected his developer, and made one of more reasonable proportions. I think, however, I may say that the exposure was shortened considerably by my arrangement of blinds.

My long experience in the studio, described in former chapters, enabled me to help him at once. Instead of the red reflections that had so completely bothered him, my contrivance furnished him with a white cloud sufficiently large to perfectly illuminate the sitter and yet cause no black shadows.

I have already referred to the limited amount of light employed by Adam Salomon for his brilliant portraits; it may be well, however, at the present moment to say more on this question of the amount of light to be employed.

I will start with the axiom that the eye is the jewel of the face, and that the proper setting of this jewel—in other words, the proper lighting of it to bring out its great brilliance—is of the first importance. Now, let us imagine two methods of lighting: one with light coming in every direction, as it did, for instance, in my monster studio before any blinds were put up; and the other with the light stopped down to an area of three feet square. In the first case, the enormous quantity of light coming in every direction would cause the pupils to contract and the eyes would be flat and lustreless. The face also would be almost destitute of shadow, and, in consequence, there would be a great lack of rotundity, and the features would be flattened—so much so, in fact, that the likeness would not be at all striking. Every one must have noticed that individual portraits in groups taken in the open air are frequently most difficult to recognise. This is almost entirely due to the absence of relief caused by too much light and the consequent flattening of the features.

Now, let us go to the opposite extreme, and limit the light as much as possible. I have mentioned an area of three feet, but I will go beyond this, and make a picture by the aid of a single magnesium ribbon, burnt, of course, sufficiently long to give a fully exposed image, and also, equally, of course, at the right angle for artistic effect. An examination of the print from the negative made under such circumstances will make manifest a very different result from the one done in the open air, or in a studio without any blinds. The eyes will be found to glitter like jewels; but there will be too much glitter. All the grain of the skin will be rendered with too much intensity. Every little indentation in the features will be represented as so many black furrows; and the shadows under the eyebrows and the chin, as well as the nose, will be rendered by streaks of black. The moral from these two imaginary experiments is obvious: Use enough light to give delicacy to the shadows, but, beyond this, limit it as much as possible, in order to give force and brilliance to the eyes, which are the most important parts of the face.

VALENTINE BLANCHARD.

A NEW PHOTOGRAPHIC STUDIO FOR WHITBY.

MR. FRANK M. SUTCLIFFE started business here so far back as 1876, though, still being a young man, he would scarcely like to acknowledge it perhaps. (We are extracting from the *Whitby Gazette*.) Pioneered by a gentleman who himself was a leader in those times of the youth in art circles—the late Mr. Thomas H. Readman—Mr. Sutcliffe built a studio in Waterloo-place, which is approached by what, in this part of the country, is called a yard. Here he has worked and laboured with patience and zeal; here he has struggled modestly, not for fame and distinction, but from sheer love of his art. But he has gained that which he sought not for, yet which came as a crowning point of his industry—fame. There is no gainsaying the fact, that Mr. Sutcliffe has not only brought honours upon himself but credit to the town. There is no one man in the town who, both directly and indirectly, has been the means of what may be coarsely described as advantageously advertising Whitby than Mr. Sutcliffe. The winsome beauty of country life, the abiding joys associated with the streamlet and wood, the vast moors, the sequestered glens, the rustic bridges, and the thousand-and-one wondrous odds and ends of pastoral life, have been focussed by him single-handed, and brought out before us in all realistic freshness—in tone, perfect; in art, captivating and enduring. While in still life—in the reproduction of Nature in her ever-varying moods—now gracious, now sullen or tempestuous, Mr. Sutcliffe has ever had an artistic eye upon the ever-effective humours and oddities of human life. Who in the world, having once seen them, is likely to forget his *Water Rats*, and his back picture of excited lads at the *Scotch Head*, his limning of characters, and especially of fisher-folk life? All these pictures are not of mere local renown. They are known, practically speaking, all over the world, and in photographic art circles are held up as high types and examples of what may be, and has been, accomplished. Mr. Sutcliffe has achieved honour and profit, not only in the place of his abiding, but also distinction in the highest corporate bodies of his art; his work and skill have been sealed, emblazoned and gold-medalled, not only in England, but in foreign countries, on more occasions indeed than at this moment we would care to enumerate. Moreover, the occasion does not arise just now, for we are dealing with a purely new departure of commercial enterprise upon which Mr. Sutcliffe is now embarking. We have alluded to Mr. Sutcliffe starting business in Waterloo-place eighteen years ago. From this modest spot, the light of which was sadly eclipsed by the erection of the hall adjoining, all the great works which have won him his successes in the art world have had their mechanical creation. Strange that such a vast amount of work should be produced from such a comparatively small place, and to go forth and charm the great world without! It is strange, also, that Mr. Sutcliffe should have remained in that retired spot so long, and so hiding, as it were, his personal identity. There is but one explanation, we should think, and that is, that Mr. Sutcliffe is a very diffident man. Yet he is just now showing some indications of the spirit of the life of his father, Thomas Sutcliffe, who seemingly went a little out of his way to demonstrate that art itself might not be out of place in the street, showing how the gross and callous-looking shops even might be made more pleasing to the eye. We do not know whether the same idea has struck Mr. F. M. Sutcliffe, neither does it matter for the moment. For what we know to the contrary, it may be altogether directly unintentional, yet, after all, following the inevitable law of sequence. At

any rate, Mr. Sutcliffe has left the remote Waterloo-place, and, by the time these lines are in print, will have established himself in what, to all intents and purposes, are new premises.

Architecturally speaking, the new place is an acquisition in that line to Skinner-street, and, when it becomes furnished with the art-gems of the photographic skill of the proprietor, it is likely to prove a halting spot to all who pass that way. While the outside show—if one may be permitted to use such an expression in this connexion—will presumably always be attractive and pleasing, the best collection of artistic work will probably be found within, hanging about the spacious rooms, the corridors, galleries, and staircases. The arrangements of the interior are perfect. All details have been well considered, well thought out, and well executed. There has been no stinting of any kind. The studio itself—a fine apartment, brilliant with natural light, with arrangements for its modification or toning—will be a treat to behold. There are few places of the kind in England capable of rendering so good an account of itself. It would be somewhat wearisome to go into details about the length and breadth of the rooms that the building is divided into, and to indicate the style in which they are about to be furnished. Such details would not be interesting. Briefly, however, it is but just to say that the designs, thought over and pondered for many months, have and are being consummated, with the general result that the establishment, for the purposes intended, will prove a long way ahead, not only of what has been accomplished in Whitby, but what has ever been thought of before in local connexion. The whole is a credit to Mr. Sutcliffe, and forms an additional attraction to the two few modern structural beauties of Whitby. Not merely are the dressing-rooms and waiting-rooms, the guest-rooms, and the reception-rooms arranged with all due regard to visitors, but the apartments for developing, printing, toning, and the like—all indeed within the nomenclature of the photographic artist—are in perfect order and sequence. The entire building will be warmed in winter by hot-water pipes and cooled in summer by a well-conceived system of ventilation.

THE ROYAL PHOTOGRAPHIC SOCIETY AND EDUCATION.

Some years ago, when officially connected with a North-country Society, I broached, before a small congregation of members, a scheme which I thought would not fail to be of benefit to photographers generally, amateur or professional. This was that the Society should inaugurate a series of lectures on *theoretical* photography.

I may say, in passing, that the practical element was being treated of fairly well at the time. At the outdoor meetings older and more experienced men were always willing and desirous of imparting information and advice to their younger fellow-members; demonstrations, also having for their purpose the improvement of technique, followed each other with fair regularity. The lectures were intended to cover every branch of the photographic art, and, on the syllabus of the City and Guilds of London Institute, impart valuable information and instruction to such members of the Association as chose to attend the classes and present themselves for examination; also that successful students would receive not only the certificates of the City and Guilds of London Institute, but some acknowledgment from the Society—the latter, however, depending more upon practical and visible evidence of ability, as shown by work in open competition and exhibition. I thought it likely that a student (referring here more particularly to the professional, would go into the world the better equipped for a year or two's course of this kind than another who neglected, or was unable or unwilling, to avail himself of such opportunities.

It is only fair to say that no real objection was raised. Who would undertake the lectures? Was I prepared to do so, or find the man for the vacancy? This was the real "crux," and only difficulty. One had the ability, but lacked the time; another had the time, but lacked the qualification. I discovered at this time certainly a universal genius, who was prepared, in his own person, at a moment's notice, to deliver a course of lectures on any subject under the sun, from the beginning of the alphabet to the end, provided I got him a sufficiency of students! This clever gentleman's knowledge of photography being at the time (and I believe since) practically "nil," the negotiation and scheme fell through.

In course of time, having myself acquired the necessary qualifications, I should have again opened the subject, and had, as a matter of fact, taken steps to form a class at a well-known science school, when circumstances led to my removal from the north.

Now, after an apology for this preliminary, it occurs to me that it is to the Parent Society we should look for any forward movement in the matter of education. Possibly the Council have barely got used to their new dignity, have not had time, figuratively, to turn themselves round; but I would respectfully submit that they, in order to become full and worthy representatives of the art and science of photography, having first got themselves into a habitation large enough and important enough to reflect credit on all concerned, should take up, if only to the extent of approbation, encouragement, or official recognition, this question of education.

We all remember, I suppose, a noted embroglio of two or three years since, and we all know something of a secession. Is this matter incurable, and are the differences never to be adjusted? I have read somewhere, and I believe it to be true, that "secessionists are seldom in the right." Are there no means of bringing some of these gifted but prodigal sons of photography back to their *alma mater?* Would not a question of the better education of photographers in the direction of art, theory, and technique—to say nothing at present of a benevolent scheme—be a subject of sufficient importance and interest as to lead to a reunion of forces?

J. Pike.

SOUTH LONDON SOCIETY'S PHOTOGRAPHIC EXHIBITION.

The Sixth Annual Exhibition of this Society was held, last week, at the Public Baths, Camberwell. The bath formed a capital *locale* for the display, being spacious, lofty, and well lighted. The show of pictures was an unprecedentedly large one, and, taken all in all, was probably the best yet organized by the Society. The Judges were Mr. W. E. Debenham, Mr. T. Fall, and Mr. L. Warnerke; and they awarded twenty-six medals among the competitors in the various members' and open classes.

In a not particularly strong (members') Class A, portraiture and figure study, including animals, Mr. Howard Esler obtained a bronze medal for a well-defined group of *Highland Cattle.* Some superb work characterised Class B (architecture), in which Mr. E. R. Bull received the silver medal for a beautiful view of *The Choir, Canterbury;* Mr. B. Lyon a bronze for a good rendering of *The North Aisle, Winchester,* and Mr. C. H. Oakden one for a carefully treated *Reredos of Truro Cathedral.* We especially admired the admirable contributions of, besides the gentlemen named, Messrs. Esler (Durham interiors), W. F. Slater, J. F. Kelly, and C. F. Dickinson. Class C was for landscape and seascape (¼-plate), and Mr. Esler won the silver medal for a crisp and effective *Autumn on Paul's Cray Common,* and the bronze for *Brig o' Turk Hamlet,* a bronze also going to Mr. W. Howell's study of *Silver Birches.* Perhaps the most ambitious effort in the class was Mr. J. T. French's "*Will father receive me home again?*"—a desolate-looking female seated by a lonely roadside. Mr. Heath and Mr. G. Brown sent capital landscape studies to the class. Class D embraced land and seascapes ½-plate and under. Mr. Whitby took both medals for a photographically perfect fishing study, *The Angler's Retreat,* as well as the bronze for *A Flooded Road.* The effect of Mr. W. C. Boyce's *Misty Morning on the Thames* was exceedingly good. The bronze medal in Class E went to Mr. W. Rice for an enlargement of a sharp original of *A Dulwich Swan.* Mr. C. F. Dickenson was successful in the lantern-slide class, and in G (excursion pictures), Mr. Oakden's *Choir, Winchester,* and a commonplace view of *Day's Lock, Oxford,* by Mr. Maull, took bronze medals.

There were four open classes. In that (H) for pictures which had previously received an award, the silver medal went to Mr. S. J. Beckett for his well-known *Verona,* which beat such capital productions as Moore's *Veteran's Tale,* Esler's *Peaceful Old Age,* Anckhorn's *Music hath Charms.* We liked Mr. E. Baynes Rock's *Grief,* a gaslight study of a lady with her head buried in her arms. The Class (J) for previously medalled pictures was a large and good one, Mr. C. R. Whiting's *Nocturne off Cowes* being awarded the silver medal, and bronzes going to Mr. Warneuke for *A Morning Cruise,* and to Mr. Post for his daintily interpreted *Reflections.* In the open lantern-slide classes Messrs. Farmer, Dockree, Grant, and Brooker were successful.

Having three Exhibitions to deal with this week, we are again compelled to cast our remarks in the briefest possible form.

The trade section was a large and interesting one. The Judges gave the Prosser-Roberts Drug Company a medal for the best trade exhibit; the Company had a vast and comprehensive show. Mr. B. J. Edwards was awarded a medal for his transparent developing dish, and Mr. W. Tylar one for his metal dark.

Prominent exhibitors in this section, the arrangement of which redounded to the credit of Mr. W. F. Slater, its organizer, were Mr. O. Scholzig, Mr. R. R. Beard, Messrs. Beck, Mr. W. F. Slater, Mr. Park—in all, twenty-one firms. It made the best trade exhibit we have seen at any minor Exhibition.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

A very delightful display of members' work was got together by this Society for its annual Exhibition, held on Monday and Tuesday at Jubilee Hall, N. In the department of land and seascape some pictures of the highest artistic excellence were hung, and, viewed all round, the Exhibition, which marked a notable advance on the previous year's, was one of which the North Middlesex may be proud. Such men as

Avery, Golding, Mummery, and Marchant were represented at their best—a fact which suffices to convey to the non-visitor an idea of the general nature of the Exhibition.

The Judges—Messrs. Andrew Pringle and B. Gay Wilkinson—"consider the Exhibition a very fine one when they take into consideration the size of the Society. Evidently many of the members are giving serious attention to the artistic aspect of photography, and several have achieved real success."

The following were the awards:—No. 26, *A Waterway*, John H. Avery. No. 29, *Reedy Waters*, E. Spencer. No. 41, *The Sky O'ercast—The Joyless Winter Day*, J. C. S. Mummery. No. 42, *Left by the Tide*, A. J. Golding. No. 54, *A Farmhouse*, W. Taylor. No. 55, *Evening*, F. W. Cox. No. 58, *'Twixt Ebb and Flow*, S. E. Wall. No. 130, *A Coming Storm*, J. W. Marchant. No. 154, *Mellow Marshland*, C. H. Dawkins. No. 207, *An Autumn Evening* (lantern slide), R. R. Barrett.

Mr. C. Harrop Dawkins, whose name is new to us, sent two pleasing studies, *The Silver Winding Stream* and *Ebb Tide*, the former of which, if too hard in the water lights, was, nevertheless, an effective, well-chosen view. Of Mr. Avery's carbon *Waterway* we have before spoken in terms of praise. Mr. Ernest Spencer's *Reedy Waters*, a charming platinum tree, river and reed excerpt, well merited the certificate it gained. The same gentleman had a good at-home portrait of a lady, taken by the aid of lamps and candles. Mr. S. E. Wall had a below-bridge river view, the Tower Bridge just showing through the haze, which was highly effective. Of Mr. Mummery's and Mr. Golding's certificated pictures (Nos. 41 and 42), it is unnecessary for us to speak. Mr. C. Beadle showed a delightful cattle piece, *A Quiet Watering Place*, cattle in a stream by a tree-shaded bridge. Mr. Golding's *Water Meadows* struck us as lacking in contrast. Mr. H. Taylor's *Farmhouse* and Mr. F. W. Cox's *Evening* (both certificated) were both good studies—the former especially—being photographically as well as artistically excellent.

Mr. S. E. Wall's *Twixt Ebb and Flow*, the sun striking through the mist on to a river dotted with a craft, was most happy in its effect, and well deserved its certificate. Mr. F. L. Pither's *Now Fades the Glimmering Landscape*, a hill-bound river in a late light, was quite too broad in effect to suit our taste, moreover, the shadows seem to have been badly put on the print, which had a spotty effect. Mr. C. H. Dawkins' certificated picture, *Mellow Marshland*, was a carbon study, in the foreground shadows of which we should have preferred to have seen a little more separation. Mr. McIntosh showed an excellent photogravure of a portrait of himself, not for competition. Print and portrait were alike meritorious. Mr. J. W. Marchant's *Canterbury Interior* (from the south transept), was, in all respects, a fine example of this class of work, and perhaps the best of its kind hung. His *Coming Storm* (certificate) was a bold and highly effective study of turbulent clouds sweeping across a river. Mr. C. Beadle had a capital portrait of a young lady in red carbon, erring, we thought, somewhat on the side of flatness.

We have only left ourselves space to mention that, besides the foregoing, many other excellent (and otherwise) contributions made up a really good Exhibition, one of the features of which was a small section devoted to showing the work that received judicial notice in former years.

LEYTONSTONE CAMERA CLUB'S EXHIBITION.

Admirable throughout in the quality of the work shown, the third annual Exhibition of the Leytonstone Camera Club, held last week, must be pronounced a thorough success. Indeed, we go further, and give it as our opinion that, as was the case last year, of the minor Exhibitions this must, on all hands, be pronounced the best. Scarcely a picture was hung that did not betray unmistakable artistic merit, and the Judges—Messrs. B. Alfieri, Horsley Hinton, and A. Pringle—must have had a pleasing task in the allotment of the awards. It is no secret that to the second of the three gentlemen named much of the credit attaching to the Leytonstone Club as a picture-producing body must be ascribed. Praise is distinctly due to the executive for the capital way in which the display was arranged, and for having organized a show of work in the open classes which we have not for a long time seen excelled.

To Mr. F. W. Wates was awarded the silver medal in Class A (landscapes and seascapes—members) for a night view of river and craft—*Ships that pass in the Night*—a very pleasing and withal truthful effect. Mr. W. E. Hall's bronze, for a soft, harmonious study, *Reflections*, was thoroughly well earned. Mr. C. Andrews, Mr. A. E. Bailey, and Mr. C. A. Russell had some charming efforts in this class. Architecture monopolised Class B, which, though small, was a good one, Mr. Gear securing the silver with a beautiful photograph of *The Eastern Aisle, Winchester*, and Mr. A. E. Bailey the bronze for a faultless view of the *Choir and Reredos, Salisbury*. Class D (portraiture and figure study, including animals) included nothing startling, but there were some good enlargements in D, Mr. J. H. Gear's *Towards Sundown* and *Across the Ferry at Low Tide* being delightful views, *Dropping Down with the Tide*, a river view, obtaining Mr. C. A. Russell a bronze medal.

The open classes were noticeably good. In G (Champion) Mr. Lionel Bennett took the gold medal with his *Wapping Pier*, and Mr. Eickemeyer a bronze for *A Summer Idyl*. The latter gentleman showed several of his familiar works, including *My Father, Sweet Home*, &c., Mr. A. J. Golding's *Where Sea Meets Land in Daily Strife* was passed over, as were Mr. Beckett's *Verona* and other good works. Mr. E. Baynes Rock's very clever *Reverie: A Study by Ordinary Lamplight* quite deserved its bronze. It is a lady seated by a lamp, and, besides being artistically treated, the exposure was timed with singular accuracy to secure soft-harmonious lighting. In the open class, H. (prints of all kinds by any process) Rev. A. H. Blake for his pretty and effective little excerpt, *Thistle, down*, took the silver medal, and bronzes went to Mr. Lionel Bennett for *Sunset on Blair Summit* and Mr. Coath's humourous studies of *Puppies and Child*. Lack of space alone prevents us from treating in detail of the many delightful entries in this class, and we can only therefore mention, as being specially worthy of praise, the work of Mr. Bhedwar (some fine portraits) J. H. Anderson; Lankester; W. Thomas; W. S; Aston; D. Pym (amusing kitten bits); W. J. Byrne (excellent portraiture). H. W. Bennett, &c.

A loan collection included examples of collotype by e London Stereoscopic Company, miscellaneous reproductions by the Autotype Company, English landscapes in photochrom by the Photocrom Zurich Company, &c.

OBITUARY.

Alexander Ayton, Junior.

Without a moment's warning, Mr. Alexander Ayton, President of the Edinburgh Photographic Society, died at half-past five on Friday evening, the 23rd ult. Mr. Ayton was a professional portraitist in Edinburgh, and was a man of considerable enterprise and energy. The assiduous attention he and other members of the Edinburgh Society paid to the members of the Convention at their Edinburgh meeting in 1892 will not soon be forgotten by those then present, while the large group of the members taken by him remains a monument of his technical and artistic skill in the taking of groups, in which branch of photography he was well known to have been an adept. We visited his studio and work-rooms during Convention week, and noted his electric light system. He was a comparatively young man, and his passing away will occasion sorrow to many.

R. L. Kidd.

Those who have so very recently fraternised with Mr. R. L. Kidd, the chief of the well-known firm of Morgan & Kidd, Richmond, will be painfully surprised to learn of his death on Sunday afternoon last, the 1st inst., an event which occurred after an illness of a fortnight. Mr. Kidd was a man of excellent business tact, a most competent photographer, and an enterprising and honourable manufacturer, who has left for his firm the legacy of a character of the highest class. His remains were consigned to earth in Richmond Cemetery on Wednesday in the presence of a large number of friends, amongst whom we saw Messrs. F. P. Cembrano, J. Traill Taylor, E. J. Wall, Snowdon Ward, J. L. Lyell, H. M. Dennis, W. T. Morgan, E. C. Morgan, and about a hundred of the *employés* of his large factory and art works. His widow, who is so well known from her regular attendance at the Photographic Convention of the United Kingdom, has our deepest sympathy, and we can say that of their numerous friends throughout the country. Mr. Kidd, who succumbed to an attack of typhoid fever, was only thirty-five years of age.

Just before going to press we were sorry to learn of the death of Herr Fritz Luckhart, of Vienna.

News and Notes.

Ealing Photographic Society's Exhibition.—Mr. F. Dunsterville's stereos received a silver medal in the open class, not a bronze medal in the members' class as stated.

Royal Photographic Society.—Ordinary Meeting, December 11, at 50, Great Russell-street, at five p.m. *Photo-engraving with Silver Salts*, by Mr. Warnerke, who will demonstrate the process.

South London Photographic Society's Exhibition.—On the closing night of the Exhibition, December 1, after the distribution of the awards, Mr. Maurice Howell (Vice-President) rose and intimated that he had a pleasant duty to perform. After referring to the progress of the Society, he said in its President the Society had a first-rate leader. It had been said "that the President should be the soul of the body over which he presided." Mr. Edwards had been the soul of the Society. A man who had been for many years a practical worker, equalled by few, excelled by none, and always at his post ready to advise in cases of difficulty and emergency, giving his time, talents, and experience for that purpose, never grudging time or trouble in anything he has done. He has endeared himself to every one in the Society. It was scarcely to be wondered that some of us made up our minds to present him with a testimonial as a mark of the appreciation of his zeal in the service of the Society. The form of the testimonial is a watch as a momento of the esteem in which we hold him. After the presentation had taken place, Mr. Edwards said he had great pleasure in accepting the testimonial, not merely

on account of its intrinsic value, but more particularly for the inscription engraved upon it, which will always recall to my memory the South London Photographic Society and its numerous friends. I hope the good fellowship which exists at the present time will always be maintained, and that the Society will continue to prosper and work to maintain its reputation. I assure you I shall take the same interest in the Society in the future as I have done in the past, and thank you for the testimonial.

EXHIBITION AT EASTBOURNE.—Mr. J. J. Hollway, of 11 Hyde-gardens, Eastbourne, Hon. Secretary of the Eastbourne Photographic Society, writes: "We propose to hold an Exhibition during next spring, and have just fixed the date of opening for April 30. The large concert-room and adjoining lecture-room at the Pavilion, Devonshire Park, have been taken for the purpose. The lecture-room will serve well for our lantern entertainment and lectures. Our picture show will, in the main, be by invitation, with perhaps a few competitive classes for members, or extended within the county. We are relying mainly on the technical exhibits with, of course, as good a show of high-class photographs as we can get together. The week we have chosen is that directly after a week which will be a round of attraction in the town (from April 22 to 27). That period will include a 'battle of flowers,' military tournament, and several other items, and we are hopeful of extending this time, and possibly, getting some of our visitors to stay longer. The following are the principal features:—1, Loan Exhibition of choice photographs; 2, Competition work to a limited extent; 3, Latest developements of colour printing; 4, Examples of photo-mechanical work; 5, Photography as an aid to astronomy; 6, Photography as an aid to meteorology; 7, Photo-enamel work with demonstrations; 8, The electric light as applied to portraiture; 9, The manufacture of lenses, with practical demonstrations; 10, The magnesium light as applied to the photography of interiors, &c.; 11, The optical lantern as an aid to the study of photography, chemistry, &c.; 12, Cycles adopted to photographic requirements; 13, Lectures on photographs and allied subjects; 14, Lantern picture entertainments."

AN amusing story is told at the joint expense of an engaged couple, a prospective mother-in-law, and an instantaneous photographer. The affianced persons, says the *Daily Telegraph*, a young man from the provinces, and his fair cousin, who lives with her parents in Paris, went with the young lady's father and mother to the Montmartre Fair, the youthful provincial paying all the expenses of the visits to the menageries, waxworks, and peep-shows. It suddenly occurred to him that it would be a good thing to have the family group photographed; so all repaired to the booth of an instantaneous artist, who, after he had fixed the sitters, undertook to send the proof to the abode of the father and mother when it was dry. The young man thereupon promised to call personally for the group, and he did so on the morrow, when a parcel carefully tied up was placed in his hands. He repaired with it to his prospective mother-in-law, who, on opening the packet, uttered a piercing shriek, which re-echoed through the house as well as the flat. Then she flung the parcel from her with loathing, and the young man picked it up. To his intense astonishment and horror, he found that, instead of the family group, the instantaneous operator had sent a photograph representing a donkey, an ox, and two cows. The young man from the provinces, deeming himself to be the victim of a derisive practical joke, lodged complaint with a commissary of police, who summoned the operator to his presence. The man was amazed at what he termed the result of a stupid mistake. He had been photographing cattle, owned by a farmer at Saint Denis, and he had mixed up the two *clichés*. The family group was sent to the farmer, and, as it could not be recovered for a few days, he offered to repair his error by taking a new likeness of the young man and his relatives. The prospective mother-in-law would not agree to this, and maintained, in spite of explanations and entreaties, that she had been grossly insulted. She furthermore declined to allow her daughter to marry the man who had foolishly led her into the photographer's booth; but she may rescind her Draconic decision after a day or two of calm deliberation.

A PHOTOGRAPHIC SOCIETY FOR BOURNEMOUTH.—A meeting to form a Photographic Society for Bournemouth was held on November 27 last at Athenæum-chambers, Town Hall-avenue, now the headquarters of the new Society, and was well attended by those interested in this art, which has now become so fashionable, and from which so much pleasure is derived. From the amount of interest taken in the proceedings at the meeting, there seems every indication that the new Society will prosper. Although photographic work in Bournemouth has been carried on during the past four years by a section of the Scientific and Antiquarian Society, yet it was found that as a section, owing to not having control of its own funds, it was unable to make that progress which photographic work in the district merited. The new Society starts with a membership of over twenty, and it is intended that practical demonstrations on photographic subjects by well-known experts shall be given during the winter months, also exhibitions of lantern slides. An enlarging apparatus has already been presented to the Society by the President, and we understand that the Shaftesbury Hall has been secured for a photographic Exhibition, to be held during the first week in February next. A well-fitted dark room has also been placed at the disposal of the members. All these attractions augur well for the Society. The following officers were elected at the meeting:—*President:* Mr. J. W. Bennett.—*Vice-Presidents:* Dr. Hyla Greves and Rev. J. R. Husband.—*Committee:* Messrs. Marriner, Toone, Bilson, Lee Lloyd, Youngman, and Price.—*Treasurer:* Mr. W. Jones. *Secretary:* Mr. E. Greenleaves. The subscription has been fixed at 10*s.*, but this includes the use of a well-supplied reading-room, containing most of the daily and photographic papers, as well as attendance at all the meetings of the Society, and, by an arrangement with the Scientific and Antiquarian Society, attendance at the meetings and the use of the library of this Society can be had without extra payment.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 22,895.—"Improvements in Photographic Cameras." D. H. HOUSTON.—*Dated December*, 1894.

No. 22,896.—"Improvements in Photographic Cameras." D. H. HOUSTON.—*Dated December*, 1894.

No. 22,952.—"Improvements in and connected with the Developing of Photographs." Complete specification. A. G. ADAMSON.—*Dated December*, 1894.

No. 23,052.—"Improvements in Screens employed in Photographic 'Process' Engraving." A. W. K. BRYAN.—*Dated December*, 1894.

No. 23,068.—"Improvements in or connected with the Printing and Developing of Photographs." H. W. SEABLE.—*Dated December*, 1894.

No. 23,113.—"Improvements in Frames or Mounts for Photographic and other Pictures or Objects." STRONG & Co., Ld., and C. WELSH.—*Dated December*, 1894.

PATENTS COMPLETED.

IMPROVEMENTS IN FOLDING PHOTOGRAPHIC CAMERAS.

No. 18,595. HENRY HILL, 151, Fentiman-road, Clapham, London, S.W., and ARTHUR LEWIS ADAMS, 81, Aldersgate-street, London.—*September* 29, 1894.

OUR invention relates to folding photographic cameras, and has for its object to so arrange and construct such camera that it may be set up for working by a single movement, and may, by a reversal of that movement, be folded into a small compass.

Now the manner in which we arrange and construct our folding camera is as follows:—

On a suitable frame of wood, or other suitable material open on one side, we pivot two arms, the other ends of which are attached to the ends of a plate (which latter may carry the shutter and also the lens); this plate—which we will term the front plate—being in length the width of the camera or thereabouts, and the width of the plate being the depth (or thereabouts) of the camera from back to front, and the length of the arms being the focal length of the lens or thereabouts.

At the upper edge of this front plate we pivot two other arms (*i.e.*, one on each side), having slots in the direction of their length, and travelling or guided on fixed studs on the aforesaid frame, the length being sufficient to allow the front plate to be brought forward and downwards until the ends of the slots in the two last-named pivoted arms come into contact with two said studs inserted in the sides of the camera, or, instead of slotting these arms, same may travel in a guiding swivel, or equivalent manner.

We now provide a suitable bellows or covering, flexible, and jointed in such a manner that it covers in the space between the said frame and the said front plate, thus forming a light-tight chamber of the usual description.

The camera thus arranged and constructed can be readily and quickly got ready for use, as, by a single movement, the front plate is swung through an arc of about 90° (*i.e.*, from its folded position, where it lies in a parallel plane—or thereabouts—with the side of the frame to its position ready for use where its plane is at right angles, or thereabouts, to the plane of the side of the aforesaid frame) and just as it reaches the latter position, a spring catch—or other suitable means—engages and locks each of the said slotted arms (or equivalents), so that same are held rigid, and in conjunction with the first-named pivoted arms hold the bellows part and front plate in a fixed position to form the camera ready for taking photographs.

To fold or close the camera, the aforesaid spring or other catches are released, and the front swung in the reverse direction until same lies in a parallel plane (or thereabouts), and close to one side of the frame, the bellows part folding within said frame, the whole camera being thus, in one movement, reduced to a very small compass.

Any suitable dark slide, or changing backs, or reservoir plate, or film-holders may be arranged to be used in connexion with this camera.

IMPROVEMENTS IN AND RELATING TO CARRIERS OR ENVELOPES FOR, AND TO MEANS FOR, EXPOSING PHOTOGRAPHIC DRY PLATES.

No. 21,675.—JAMES MCLACHLAN DOBSON, Springpark, Springfield-avenue, Uddingston, Lanarkshire.—*September* 29, 1894.

THIS invention has reference to and comprises improvements in envelopes or carriers for photographic dry plates, and in appliances in connexion with the ordinary dark cell or slide used for exposing the plates in the camera, and its object is to enable any number of dry plates, each enclosed in an envelope or carrier, to be carried by the operator, and exposed singly, all in a more convenient manner than by the methods heretofore in use.

According to one mode of carrying the improvements of this invention into practice, an envelope or a carrier would be used of a form much the same as the ordinary envelopes used for postal purposes, and preferably made of stout, actinic, light-proof orange or ruby-coloured paper, and of a size to hold the dry plate to be used. This envelope would have the usual folding and closing gummed flap on its back side, and the inner surface of the plain front side would be lined with thin cloth, preferably black, which is carried out through one of the ends for a short distance, and this end is closed by securing by glue or equivalent material a small folded-over flap at the end of the back side of the envelope. The plates would be inserted singly into envelopes so prepared within the dark room, with their sensitive films next the cloth on the front side, and, the flaps being securely gummed down, they could be freely handled under ordinary daylight without being injuriously affected.

In order to expose in the camera dry plates enclosed in envelopes, as de-

scribed, a dark cell or slide, preferably one formed for carrying a single plate, would be used, fitted with the improved appliances to be described. Upon the rear end and on the outside of the sliding shutter, which is drawn out to expose the dry plate, would be mounted a transverse spindle or roller, carried in bearings secured at each side to the shutter, and extended on one side to project beyond the bearing and over the side bar of the frame of the slide, this projecting part being formed as a small toothed pinion. A corresponding toothed rack would be secured on the same side bar, extending some distance front end towards the back, and the toothed pinion would take into and be revolved with the roller by this rack when the shutter is drawn outwards. The roller may be smooth, but would preferably be roughened on its surface, or be formed with teeth similar to the pinion. To one end of this roller a small semicircularly curved plate or cover would be hinged or pivoted by a pin passing through the roller, so that the plate can be folded down on the roller so as to grip the cloth of the envelope, as will be explained. When folded down, this covering plate would be secured in its closed position by a collar on the roller being slipped over its free end, said collar being kept in position by a spring between it and the bearing at that end of the roller. Other means of actuating the roller may be employed instead of the rack-and-pinion arrangement.

To use these appliances, the plate enclosed in its envelope would be placed within the dark cell provided with the usual plate-holder and sliding or hinged shutter for the purpose, and, the exposing shutter being drawn slightly open, the projecting cloth of the envelope would be passed out through the opening to the outside of the cell, and the shutter closed light-tight on it. This projecting cloth would then be turned over on to the roller, and the covering plate of same shut down over it and secured in position by the beforementioned collar, when all would be ready for exposing the plate in the camera. On the exposing shutter being drawn out, the drag upon the cloth would tear away the whole front of the envelope and expose the plate to the light, and the roller being revolved by the rack and pinion would roll the cloth and paper upon itself. After exposure the plate would be dropped into a box suitably prepared and fitted to receive it from the dark cell without exposing it to the influence of light.

Portable Apparatus for Producing Enlarged Copies of Photographs.

No. 21,880.—Edgar Clifton, 106, Regent-street, London, W. *September* 29, 1894.

My invention consists of an improved apparatus for producing enlarged copies of photographs, either negative or positive, from small *clichés* either on glass plates or films. It consists of a rigid baseboard of suitable length, having frames hinged to both ends. The frame at one end is grooved so as to take an ordinary photographic dark slide capable of holding a plate, film, or paper of the dimensions of the proposed enlargement. The frame at the other end is covered by a board with an aperture, to which is fitted a photographic lens. At each side of such opening are placed grooves or runners, in which is fitted a small bellows camera body, having at one end an opening for the aforesaid lens to pass through, and at the other a suitable carrier for holding the film or plate which is to be enlarged from. These frames are connected by means of a tube or body, which may be made of leather, cloth, paper, or other suitable material. This tube is made with such gussets or folds as will enable it to be folded down flat upon the baseboard without detaching it from the aforesaid frames. The small camera body is also made to fold so that it may be closed without removing from the main body. Either or both of the cameras may be provided with an adjustment for focussing, or the focus may be permanently fixed at the making the cameras.

The claim is :—A portable apparatus for producing enlarged copies of photographs, consisting essentially in a rigid baseboard, to the opposite ends of which frames are hinged so that same can fold down in relation to such baseboard, and the two frames being connected by a camera tube or body, which can also fold up, one of such frames being provided with means to receive a dark slide to contain the sensitised plate or film on which the enlargement is to be made, while the other has an ordinary camera lens secured thereto, and a small bellows camera being fitted to the latter frame, and into which the photographic lens projects, the outer end of such small bellows camera being provided with means to receive the *cliché* or plate from which the enlargement is to be made, all substantially as specified.

Improvements in the Construction of Panoramic Scenes, and Method of and Apparatus for Producing the Same.

No. 16,326. Joseph Train, Ayrshire House, Albert-road, Albert-park, near Melbourne, Victoria.—*October* 6, 1894.

Since Barker, of Edinburgh, obtained, in 1787, Royal Letters Patent for his invention of the panorama, by which extensive views of nature were exhibited as seen from a central point, such cylindrical representations have attained great popularity, and entire buildings now exist up to 130 feet in diameter, erected and fitted at enormous expense, solely to show panoramic, or, as they are now called, cycloramic views. These views clo-ely imitate nature, and reproduce to the eye of the spectator the actual appearance of the real landscape as it would be seen when he successively directs his eye in every direction from his point of view towards the horizon.

The enormous expense and labour, and great skill required by the present method of preparing, viz., painting the view on the cylindrical surface or sheet used in such cycloramas, are, however, a bar to frequent changes of subject, or to the easy portability of the material. The educational advantages and the pleasures afforded by cycloramas are thus restricted.

No means has hitherto been suggested by which the production of panoramic views with realistic effects might be vastly cheapened and simplified, so that they might become objects of greater utility. My invention comprises such means.

The apparatus I use comprises a series of optical lanterns, a series of views (each view containing the "subject" of some other view), and a continuous series of screens or like surface placed around the series of lanterns, so as to form a complete circuit or a partial circuit.

The area to be occupied by the spectators should be approximately central, relatively to the screen and not exterior thereto, as the latter arrangement would prevent the production of the peculiar cycloramic effect I aim at.

By using all these parts simultaneously, and observing certain other conditions hereafter stated, the appearance of a continuous scene all round, or for a large angle around, may be reproduced in a strikingly faithful manner. The various features I employ co-operate so that the individual effect of each picture no longer attracts the eye, and instead of the spectator discovering a number of parts, each producing a mere pictorial effect, he has the illusion of seeing one continuous scene naturally and as a whole.

When a single lantern view is projected on any screen, the illusion that one sees as in reality cannot be entertained. But, by means of a series of lanterns such as sixteen, when the subject is projected on to a curved or approximately curved screen, and is continued to the right and left (all round until a complete or the major part of a complete circuit is formed—with the station of the observer at about the centre), then the individual effect of each view is effaced, they blend into one, and the eye is deceived into acceptance of the series of views, as one unbroken whole. By such means as these I produce cycloramic pictures.

Some of the parts I use have, taking them individually, been used before, but they have not before been similarly combined either for the purpose I have stated, nor in the manner I shall state.

In respect to the screen, I sometimes use a special form thereof, viz., curved in horizontal section. Screens hitherto used have consisted of a plane sheet, or of a plane wall. The rays of light falling on such surfaces leading from the objective are not equally long, and this is partly remedied by using a curved screen having the same centre approximately as that around which the optical lanterns are ranged.

The claims are :—1. The process of producing cycloramic or panoramic representations in the manner hereinbefore described. 2. In combination, in panoramic apparatus, one or more central series of optical projection lanterns or systems as described, and one or more corresponding series of lantern slides, each slide forming part of a complete scene, and placed in proper relative position as described, whereby such scene may be exhibited as a panoramic whole upon a surrounding screen or screens as set forth. 3. The combination, with a wholly or partly surrounding screen or screens and foreground, as set forth, of a cycloramic or panoramic picture representing an unbroken scene, said picture consisting of a series of separate views, which meet and merge together, and are projected upon the interior surface of the said screen or screens and foreground from one or more series of optical systems, substantially as set forth and illustrated. 4. In apparatus for producing cycloramic pictures, the general construction, combination, and arrangements of parts as hereinbefore described and illustrated in the drawings, said parts having an independent relation to each other as, and for, the purposes set forth. 5. In apparatus for producing cycloramic representations and combination of one or more series of optical systems as set forth with a movable revoluble platform for each series, and the operation of the same, substantially as, and for, the purposes set forth.

Method and Apparatus for Timing Photographic Development.

No. 23,894. Alfred Watkins, the Imperial Flour Mills, Hereford.—*October* 6, 1894.

In photographic development considerable experience is required for estimating correctly how long the plate should be left in the developer, as the appearance of the plate is not much guide in the matter. The length of time necessary varies with the amount of alkali and restrainer in the developer, and also with the temperature thereof.

I have ascertained by numerous experiments that the total length of time of development required to bring a correctly exposed plate to a given density is always a definite multiple of the time which elapses between the pouring on of the developer and the first appearance of the image. I have found that this multiple is always the same for a particular make of plate, but varies with different makes. If, therefore, the time between the pouring on of the developer and the appearance of the image be determined, which observation is easily made, this time forms a reliable basis to determine the total time required for leaving the plate in the developer.

According to my present invention I determine this time by means of an instrument so arranged that, on setting an indicator in action when the developer is poured on, and on effecting a change in such action when the image appears, the continued modified action of the indicator will correctly automatically indicate the desired multiple of the first-obtained indication. Such instrument may be variously constructed for carrying out this mode of action. Thus, according to the simplest construction, which I prefer to employ, I construct a glass vessel somewhat similar to an ordinary sand hour glass, so arranged that, when turned up one way, the sand runs through at a speed from four to ten times faster (regulated by adjustment) than when standing the other way up.

If, therefore, the sand is started to run at the faster rate at the moment when the developer is poured on the plate, and the instrument is turned upside down when the image appears, the quantity of sand which had run through has now to run back at the slower rate, so that, assuming that the instrument has in the first instance been adjusted to the correct multiple for the particular make of plate ; then, by the time the whole of the sand has run back, the plate will be found to have been correctly developed.

The construction of the instrument which I prefer to employ is as follows: A glass tube is formed with a restricted passage near one end, the orifice of which passage has projecting into it the point of a stem, screwing through the end cover of the tube, so that, by turning the stem in one direction or the other, the stem is advanced or withdrawn so as to either reduce or enlarge the size of the opening. The outer end of the screw stem is provided with a pointer which points to a circular scale on the cover, indicating the positions

into which the stem has to be turned for a certain make of plate. Within the other part of the tube is fixed concentrically a second tube closed at one end all but a very small orifice, which is presented opposite the restriction of the outer tube, while the other end of the inner tube is wide open.

The outer tube extends beyond this end of the inner tube, and is formed beyond the same with a moderate restriction. The part of the outer tube terminating in the adjustable orifice, being charged with sand, then, on turning this part of the instrument uppermost, the sand will flow through the adjustable orifice and through the annular space between the inner and outer tubes into the space at the other end of the outer tube. If, on the appearance of the image as before stated, the instrument be reversed, then the sand which had run into the other end of the tube will now be caused, by the before-mentioned restriction, to run into the interior of the inner glass, from which it will now run at a much slower rate through the small opening back into the first-named end of the outer glass, so that, by the time the sand has run back entirely, the development will be completed.

It will be obvious that the same, or a similar, instrument might be made to work with a liquid instead of sand; also, that air or other gaseous fluid might be forced to flow first through a hole, or holes, of a certain size, and then the same volume of air be forced to flow through a smaller hole or holes.

Again, a clockwork movement may be used, in which a certain part is made to travel a certain distance until the image appears, and then has its action so modified that, after the expiration of the required multiple of that time, it will give a visible or audible indication of the termination of such time.

The claims are:—1. In the development of photographic negatives, the method of timing the complete development, by ascertaining, after pouring on the developer, the time which elapses between such pouring on and the appearance of any one part of the image, then multiplying that time by a previously ascertained factor for the developer employed, and arresting the development at the expiration of the time so determined, the value of the said factor being previously determined for different developers, substantially as described. 2. The use, for determining the time required for the complete development of a photographic negative, of an instrument so arranged as to first give an indication of the time that elapses between the pouring on of the developer, and then to have its action varied so as to give a second indication of time which shall correspond to that required for the complete development, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
10	Camera Club	
10	Devonport	*Bromide Printing.* W. H. Lethbridge.
10	Lantern Society	
10	Norfolk and Norwich	
10	North Middlesex	
10	Putney	
10	Richmond	Demonstration by A. C. Baldwin.
11	Birmingham Photo. Society	
11	Brixton and Clapham	*Lantern-slide Making.* T. J. Bartrop.
11	Hackney	*Italy.* S. J. Beckett.
11	Manchester Amateur	
11	Newcastle-on-Tyne & N. Counties	
11	Paisley	
11	Royal Photographic Society	*Photo-engraving with Silver Salts.* Mr. Warnerke.
11	Stockton	
12	Croydon Camera Club	Photographic Chat.
12	Ipswich and Suffolk	
12	Leytonstone	
12	Photographic Club	Members' Open Night.
12	Southport	
12	Stockport	
13	Birkenhead Photo. Asso.	
13	Camera Club	
13	Cheltenham	
13	Dublin Y.M.C.A. Camera Club	Members' Holiday Papers, illustrated by Lantern Displays.
13	Ealing	*Carbon Printing.* A. S. Handford.
13	Glossop Dale	
13	Hull	
13	Leicester and Leicestershire	
13	Liverpool Amateur	Annual Meeting.
13	London and Provincial	Lantern Evening: Members' Slides.
13	Manchester Photo. Society	
13	Oldham	
13	West London	Exhibition of Record and Competition Prints.
14	Bristol and West of England	
14	Cardiff	
14	Central Photographic Club	Open Evening.
14	Croydon Microscopical	*On the Influence of Orthochromatic Plates and Yellow Screens on Colour Values.* J. H. Baldock, F.C.S.
14	Halifax Camera Club	
14	Holborn	
14	Ireland	*Results of Summer's Work.* Geo. Drury.
14	Maidstone	
15	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 29,—Mr. T. E. Freshwater in the chair.

The Chairman passed round several anaglyphs. These consist of two stereoscopic pictures, printed out of register in red and blue. When viewed through red and blue glasses, a stereoscopic effect is obtained. He also exhibited Benham's spectrum. It consists of a disc, one half of which is black, while the other half has twelve arcs of concentric circles drawn upon it. Each arc subtends an angle of forty-five degrees. In the first quadrant there are three such concentric arcs, in the next three more, and so on, the only difference being that the arcs are parts of circles of which the radii increase in arithmetical progression. Each quadrant thus contains a group of arcs differing in length from those of the other quadrants. When this disc is revolved, the impression of concentric circles of different colours is produced upon the retina. If the direction of rotation is reversed, the order of these tints is also reversed.

PHOTOGRAPHIC CLUB.

NOVEMBER 28,—Mr. Frank Haes in the chair.

Mr. NESBIT asked if the process of steel-facing a copper plate was likely to stop up the finer details?

Mr. WILMER said no, but steel-facing in some cases improved the plate and sometimes otherwise.

Mr. H. W. Newman was unanimously elected a member of the Club.

Mr. F. W. HINDLEY then gave his lecture upon *A Trip Through Ireland with a Hand Camera*, illustrated by about 150 slides, which were projected by the Club lanternist, Mr. R. R. Beard. Mr. Hindley, in his opening remarks, dwelt at some length upon the "disthressful country" and the ever-ready wit of its inhabitants. London omnibus and cab drivers, he said, were given to making such a remark now and then, but the Irishman was not approached by the best of them. The pictures, in conjunction with the most graphic descriptions, went a long way to help one to realise the pleasures, troubles, and humours attached to a trip through a comparatively unknown part. Nearly every picture had a tale attached, so it would be next to impossible to commit them to paper, but the following, taken at random, will serve to show the quality. Scene: A Fair. *Dramatis personæ:* Irishwoman; Mr. Hindley. The woman had driven in two beasts a distance of twenty-eight miles. Mr. H.: "Now, what's the price of those two beasts?" Irishwoman: "Sure and they'r 4*l.* 10*s.* a piece." After a little argument Mr. H. agrees to buy if she'll deliver them at his house. "But wait," says she, "the poor bastes could na swim." "Oh, yes, they could!" says he. "Perhaps better than you." "Faith, now," says she, "I'm after selling fresh mate, and by the time you got them they'd be salt mate, sure." On another occasion, after tipping a jarvey, he deliberately took off his coat, with which he covered his horse's head. When asked why he had done so, he said, "Shure, now, an' I'd be sorry to let the poor baste see so small a tip after such a long dhrive." Another jarvey, upon starting out on a drive of twenty odd miles, was asked if it was likely to rain as it had been. "Sure, now, 'tis going to be foine, an' never a drop shall we see." During that trip we passed through two fearful downpours, but which did not make that jarvey put on a mackintosh, which was tucked away on the back of the seat. 'Twas only that he should be able to say, "See, now, the rain's been nothing at all, for I haven't needed my coat." And so throughout his lecture Mr. Hindley kept his audience amused, earning for himself a most hearty vote of thanks. This was put from the chair after it had been given by the large and appreciative audience.

Croydon Microscopical and Natural History Club.—On Wednesday evening last this Club held its "Silver *Soirée*," which was, if anything a greater success than usual. We are, however, only concerned with the photographic work shown. Of this there were seventy-seven framed and sixty unframed pictures, and no less than 600 lantern slides. These were very effectively displayed, the framed pictures being hung on the walls, and the mounted pictures on screens placed on the tables. The slides were displayed in eight screens as transparencies. Although it may seem somewhat invidious to particularise, still, among the pictures, may be mentioned six 15 × 12 architectural subjects by Mr. J. T. Sandell; eight platinotypes each, by Mr. H. C. Collyer and Mr. J. Epps, jun.; and eighteen by Mr. F. W. East; four pictures by Mr. J. Packham, illustrating his new platinum process; seven by Mr. Weir Brown, chiefly by his well-known uranium toning process; eight very fine pictures by Mr. Ernest Straker, but whether they were platinotypes or matt bromides it was difficult to say, so closely may these be made to resemble one another; five platinotypes by Mr. Lincoln; and one enlargement by Mr. C. F. Oakley of a very remarkable flash of lightning, the negative of which he was fortunate to secure in July of this year, and in which the primary flash split into two, diverged, and each came to earth at a distance of five or six miles apart. It was noticeable that platinotypes and bromides practically held the field, not a single albumen print, and hardly a dozen gelatino-chloride prints, being shown. Among transparencies, Messrs. Dodd, Sandell, Oakley, and Hoole contributed some excellent examples both technically and pictorially. During the evening there were three lantern exhibitions, under the direction of Mr. J. H. Baldock, and mention may be made of some beautiful views on the east coast of Yorkshire by Mr. W. H. Dodd, and some exquisite flower studies by Mr. A. P. Hoole, of Sutton.

ON Friday evening a demonstration was given by Mr. W. J. RAMSEY, of the Eastman Company, on their *Method of Toning Solio Paper with Platinum.* This process is simple, and the results, of course, permanent. Matt-surface paper is preferable to glossy. The colour of the prints as they leave the frame depends on the age of the paper, the character of the negative, and the temperature during printing. The prints should be previously washed, and the colour depends on the depth of printing and the time the prints are in the bath, a nice warm sepia colour being got by printing deeply and short toning, the colour being judged by transmitted light. After toning they should be placed in a *stop bath* of salt, 1 in 32; or carbonate of soda, 1 in 20; then rinsed, and fixed in hypo, 4 in 20. The more acid in the bath the bluer will be the resulting print. It does not seem to matter whether citric, hydro-

chloric, or nitric acid was employed in making the bath. Mr. C. H. B. Sparrow, who had worked the process, occupied the chair.

Ealing Photographic Society.—A meeting was held on Thursday, November 29, at the Society's room, Public Buildings, Ealing, Mr. H. W. Peal in the chair. The meeting proceeded to the dark room to see a trial run of the "Davy" arc lamps. Although only temporarily placed in position, they ran very smoothly and noiselessly, and gave great satisfaction. It was then definitely settled to have these lamps placed permanently in the enlarging lantern. The ordinary meeting was then proceeded with. The CHAIRMAN proposed a vote of thanks to the Exhibition Judges, pointing out the very conscientious manner in which they had done their judging, and remarking on the very general satisfaction that their awards had given. This was carried unanimously, as was a vote of thanks to Mr. Huth. A vote of thanks to the Hanging Committee, and Mr. Simpson, and a most hearty vote of thanks to the President, Mr. Peal, for all they had done for the benefit of the Society, was unanimously passed. Nine new members were elected.

Hackney Photographic Society.—November 27, Mr. T. H. Smith presiding.—The HON. SECRETARY announced that the programme of the next two meetings would be altered. December 4, Rejlander's pictures would be shown, and on December 11 Mr. S. J. Beckett would give a lantern entertainment in special room on *Italy*. Messrs. Kendall, Sharman, Collins, and Cross were nominated for membership. Mr. WILLIAM SMITH showed and explained a new lantern-carrier called the "Uno-mano." After some discussion, it was decided to use the next open night for considering the late Exhibition, and discussing matters relating thereto. Mr. W. L. BARKER then read a paper entitled *Retouching for Beginners*, and described the materials necessary and the way to use them, giving useful hints to amateurs who wish to improve their portrait negatives.

Richmond Camera Club.—At the meeting on Monday, the 26th inst., at which Mr. Cembrano presided, a discussion on *Shutters and Hand Cameras* was substituted for Mr. Kidd's lecture, which was postponed owing to that gentleman's serious illness. There was a good attendance of members and a very interesting show of apparatus. Mr. Shew, of the firm of J. F. Shew & Co., amongst other things, showed the well-known Eclipse camera in a variety of forms, viz., with swing front, with swing back, with focal-plane shutter, and stereo and half-plate eclipse; also the Xit, claimed to be the smallest quarter-plate camera extant; and the Featherweight, whose skeleton aluminium extension gave it extreme lightness, comprised with rigidity. Mr. Adams, of the firm of Adams & Co., showed a great novelty, which, it may be safely predicted, will make a stir in the photographic world. This was the "Ledo," a magazine camera (quarter-plate) for cut films. With a capacity for eighty-four films, it appeared to be rather more than half the size of the firm's "Ideal," and has a somewhat singular changing movement, by which the exposed film is dropped into a lower chamber and a fresh one brought into register. Messrs. R. & J. Beck sent down a quarter-plate "Frena," and, although there did not happen to be a frenagrapher present, no difficulty was found in working it with the aid of the instructions. Mr. H. Little showed a mammoth "Eclipse," measuring 28×18 centimetres, and a great variety of shutters. Mr. Huddy showed Loman's Reflex; Mr. Davis, Pullman's stereo hand camera, and many other members brought cameras and shutters of various descriptions.

West London Photographic Society.—November 22.—A humorous paper was read by Mr. H. SELBY on *Photographic Questions and Answers*. Tyros at the black art soon find themselves in difficulties, and, having that species of vanity inherent to the human race—the desire to see themselves in print—rush to the editors of photographic papers. These editors, though they could point out the page and line in any shilling primer, have to keep up their circulation and so answer in a column devoted to correspondents, and one of these columns was taken and pulled to pieces, much to the amusement of the Society. The PRESIDENT (Mr. Blackmore) thought that a paper of this kind sometimes did good, though it could not be said the members would go home wiser for being there. After a hearty vote of thanks, there was an informal discussion on various matters.

West Surrey Photographic Society.—November 21, at the Public Library, Lavender-hill, Mr. W. Winsford (Vice-president) in the chair.—Colonel Gale gave his awards in the "Brook" Competition. This was for the best sets of four photographs illustrating lines from Tennyson's "Brook." There were eight competitors. Colonel Gale, in opening his remarks, read the poem, line by line, pointing out those which best lent themselves to illustration. Mr. S. Wenman took the first prize with a set of 4×3 pictures, taking for his titles, *By Twenty Thorps, Till last by Philip's Farm I Flow, With many a Curve my Banks I Fret, I make the Netted Sunbeams Dance*—the latter a charming rendering of a most difficult subject. The great difficulty found by many was to find a typical brook, and some of the sets were views rather of rivers and torrents, but all showed good and careful work. Mr. Wenman was then presented with his prize, given by Colonel Gale, which was a handsomely framed copy of *Sleepy Hollow*. A hearty and sincere vote of thanks for judging and also for his prize was passed to Colonel Gale, who, in returning thanks, offered another prize for next year, the subject to be decided upon later. A paper by Mr. G. H. James was announced for December 19, and the meeting was brought to a termination by an exhibition of the competing pictures.

Woodford Photographic Society.—This young Society held its first annual display of members' work on November 24, the admission being by invitation tickets. The Council of the Society, assisted by some of the more energetic members, worked with a will, and completely transformed the ordinary club-room, so that the ninety frames were hung clear of each other on a ground of deep terra-cotta coloured drapery. The lantern slides—eighty in number—were shown in an upright structure, very evenly and brightly illuminated from within, rendering this one of the most attractive portions of the display. The Exhibition was announced to be open from five to nine o'clock, and promptly at the former hour the visitors began to arrive, continuing in a steady stream until past the time for closing; indeed, it was at last necessary for the President to request the visitors to withdraw so that the pictures might be removed before midnight. The friends and neighbours of the Woodford Photographic Society were evidently unprepared for so much really good work as the members had provided for them, and evinced much interest in many of the examples. This was notably the case with regard to the charming photogravures by Mr. H. Wilmer, who exhibited not only the finished prints, but included one of his etched and steel-faced plates for the satisfaction of those interested in this beautiful process of reproduction. Situated as this village is, midway between the southern portion of Epping Forest on the west and the Valley of the Roding, with its alternations of wooded banks and level stretches of meadow, on the east with Wanstead Park and the high ground of Buckhurst Hill and High Beach within easy walking distance, south-east and north respectively, what wonder that we should find represented on the walls of this Exhibition many charming though nameless bits of local scenery, under varying meteorological conditions, the bright clear air and brilliant clouds of spring time, the leavy loveliness of full summer, when the streams have shrunk to the merest threads of silver, meandering through the flowering rushes; the cattle stand knee deep in the quiet pools beneath the overhanging trees; or again, when hoary winter holds the world ice-bound, and every tree and bush and blade of grass is transformed, as by fairy hand, into a semblance of the purest white coral, all sparkling with myriad diamonds in the tender light of the feeble sun. Many such were among the collection, notably, by Messrs. Spurgeon, Smith, Emler, and others, showing a delightful appreciation of the spirit of the local scenery which promises well for the Exhibitions which they propose to give in future years. These were varied by some capital enlargements of Highland cattle from snap-shots by E. B. Caird, and Swiss and other Continental views by Mr. A. Savill, jun. The proportion of enlargements to direct prints was notably large, and contained some excellent examples on Alpha paper, by Mr. E. S. Noble, the warm tone of which was eminently suitable for the subjects, while portraiture was well represented in the contributions of the present Hon. Secretary. One of these—an enlargement on Ilford rough bromide paper (24×16) from a cabinet negative, said to be wholly innocent of retouching (the subject being the author's two daughters)—attracted a good deal of attention, as did also some of the same worker's enlarged flower studies. Having previously seen something of the lantern slides produced by some of the members of this Society, we had expected to find this portion of the display above the average of the ordinary show collections, nor were we disappointed. The forest scenery was well represented by the work of several members, but we were most interested by the particularly brilliant series of Sussex views by Mr. Noble, and the quaint wood and stone carvings so ably photographed by Mr. E. Marriage. Mr. Malby was represented by much the same collection as he showed at Pall Mall, including one or two fresh copies of old engravings after J. W. M. Turner, R.A.

Aintree and District Society of Photographers and Lanternists.—November 20.—Mr. D. J. NEILL (Hon. Treasurer) delivered a lecture on *A Trip to the Highlands*, illustrated by ninety-nine limelight views of his own making. The President (Mr. W. B. Hellon) occupied the chair. At the close of the lecture, Mr. HELLON proposed, and Mr. I. E. BENNETT seconded, a hearty vote of thanks to Mr. Neill for his enjoyable lecture, which was carried unanimously.

Ashton Photographic Society's Exhibition.—A local critic writes of some of the exhibits at this Exhibition:—"Miss Janet Reid has a number of very sweet and nice character studies. Mr. L. Rolfe, one of the advanced workers in photography, sent a valuable set of photographs which were recently exhibited in London. The designation of the set is *Meadow Land and Mill Stream*. Mr. M. J. Harding sent a fine little picture styled *The Miller*, representing one of that trade surveying mankind from the open window of his mill, and obviously caring for nobody, no, not he. Karl Greger has sent another little picture named *Home from the Dunes*. The pictures of Lamond Howie are among the most attractive exhibited; the extreme whiteness of his snow is unrivalled, as in his *View on the summit of Ben Nevis, taken at Easter*, 1894. Green Brothers, of Kendal, have exhibited several delicate views from the Lake District, some in platinotype. Mr. J. W. Kenworthy has a fine large picture of Gawsworth Hall, and a little further on a grand view of Lichfield Cathedral, with umbrageous surroundings. From Birmingham, Mr. Harold Baker sent two frames of very pretty portraits; and Mr. Bernard Alfieri, one of the best workers in London, sent a large photograph of a girl, and many other noteworthy contributions. A Continental artist, M. Victor Selbe, of Antwerp, sent a number of very interesting and well-executed pictures illustrative of the entry of Charles V. into Antwerp. The pictures are gummed on wooden panels, and have a very smooth and satisfactory appearance. The procession of priests is full of life and character, as is also the picture of the Corps de Garde solemnly contemplating what little remains in their tankards after the drain that has just been made upon them. Above is seen a large picture of Harlech Castle, by Mr. Hutchinson. Mr. W. Crooke, of Edinburgh, has sent a number of large portraits, evidently done direct with the lens, and not enlargements; these were to be found in various parts of the room, and among them were *A Warrior* (a great prize-winner), *Paderewski, Lord Rutherford, J. L. Toole, A Moorish Boy, Colonel Leslie in Highland Costume*, &c. A charming little study by Stoddart, *In Thoughtful Mood*, represents a lady walking in the fields and apparently knitting. Mr. Alfred Maskell sent what he describes as a *Tocatta*, a musical term, which, as applied to a photograph, appears to mean something removed by many degrees from the intense vividness characteristic of the photographic art. The spectator is like the blind man in the New Testament, who, when not quite cured, saw 'men like trees walking.' This is called the 'impressionist' style of doing the thing, and it seems to have arisen out of dissatisfaction with the sharp-cut outlines of a well-focussed picture. This exhibit was an object of much curiosity, but we did not hear of anybody who thought the view satisfactory. Views of Galtee Castle were sent by young Mr. Abel Buckley. The old castle has been pulled down, and these are distant prospects of the new building. Mr. Glazebrook has several strings to his bow. His most interesting character studies on this occasion are laughing and rejoicing *All among the Barley*, or *Amid the tall Meadow Grass*, or *Good Rye that Grows High*. The pictures are redolent of the fresh air, and suggestive of the humming-bee among the

flowers, and the singing bird on the nearest thorn bush. Mr. Kidson Taylor of Manchester, sent some very beautiful little landscapes. *The Pine-clad Heights* is another large Alpine scene by Dr. Hamilton, and near it a similar work by Mr. Lord, *After a Storm on the Reider Alp*, a very striking aspect of nature, the lower levels being in deep gloom, while the top of the dark mountain is swathed in light luminous clouds like cotton-wool. Mr. Charles Job, a very good photographer, sends a picture named *Evening*. *Cheedale* was another of Mr. Kenworthy's fine enlargements, and near it were two pictures by Dr. Hamilton—*The Little Matterhorn*, and the *Saas Valley*. Then come a number of Mr. Cheyne's pictures, *Chrysanthemums*, *Thuringian Peasant carrying Baskets*, and *Fireside Chat* (taken with the magnesium flashlight). Mr. Arthur Pratt, who also contributed a notable enlargement of the Old Hall of Ashton, had in this part of the room a view of Marple Bridge, and S. A. Platt, *Eccleston Ferry* and portraits of children. In a large frame, Mr. Byrne, of Richmond, had a number of figure studies. Mr. Paul Lange exhibited a curiosity. The picture had evidently been taken from the stern of a steamer, and showed the tortuous swell on the water just about to strike a small boat. There were many admirers for Mr. Kenworthy's *Table Talk*, three young ladies at tea, who, we believe, were taken when they formed a tableau at the Technical School. Mr. W. Waddelow had a large framed exhibit in which the popular reciter and elocutionist, Miss Lilian Roberts, is represented in a great variety of dramatic attitudes. *Conway Sands*, exhibited by Harding, of London, was another noteworthy picture. Mr. Robert Marsland had on view an enlargement of his interior of Lincoln Cathedral, which gained a prize in a recent competition among members of the Society. Mr. Herman Rausch showed three views taken during a recent tour on the Continent. Mr. J. W. T. Norton had some views of road and river very nicely rendered. Mr. Walter Leigh contributed a view from the Thuringian Forest of stick gatherers, and some street scenes in Germany. Many views were shown of Conway Castle, one of these being by Mr. J. T. Hodgson. Two very good pictures, made out of the most unpromising materials, were contributed by Mr. A. H. Hinton, a mere bit of fenland with a bit of ditch and a lowering sky. The amateurs were unanimous in agreeing upon the merit of these pieces. The portrait of an Indian juggler, by Selbe, was spoken of with approval as a soft rendering of a hard subject. One of Mr. Glazebrook's happy inspirations was the picture of a boy making a rush whip-stock while seated on a stone with large foxgloves and ferns growing around in great profusion. The boy is at first overlooked, so well are the foxgloves brought out. It only needed the magic of colour to give inconceivable life and charm to the whole. *The Matterhorn*, by Lamond Howie, catches the eye at once as one of the finest pictures in the Exhibition. The way the fleecy clouds wreathe about the mountain side, and here and there are stripped off and dissipated by the wind, is very fine. The picture must have been taken at a very lucky moment. *The Old Lock*, by Baker, is a picture in which indistinctness is raised to a merit, but that merit is not likely to be popularly acknowledged. On the other hand, Lintott has some views *On the Derwent*, the artistic merit of which it is easy to appreciate and recognise. Some more views of *Ben Nevis*, by Howie, could not be surpassed for effective rendering of snow, and bare rock, and sky. Mr. Paul Lange's *Hardanger Fiord* and *Norwegian Seas*, taken against the light, are very powerful and effective. An autotype enlargement of himself, made by Mr. Glazebrook, is remarkably good. *A Sunset on Norwegian Seas*, by Mr. J. W. Kenworthy, in blue carbon print, is worthy of remark, and near it will be seen a panoramic view of Swiss scenery, by Mr. Brown, a member of the Ashton Society. *Where the wild duck loves to roam* is the poetic title applied by Mr. Glazebrook to a lake scene taken in the neighbourhood of Chapel-en-le-Frith. High up on the left of the main doorway on entering is a family group, taken by the Secretary, Mr. Marsland. Sound judgment must have been shown to obtain such a good rendering. In the four figure subjects by Byrne, of Richmond, the light and shade are beautifully rendered. Mr. Greenwood, a member of the Society, shows a good enlarged picture of Conway Castle. Near this is a very pleasing picture, by Mr. J. W. Kenworthy, *Cottage near the Mill*—not any cottage or mill such as we are familiar with. It is embowered in trees. Even the smoke from the chimney has to percolate through thick foliage to the open air above. The sun is shining brightly, and everything is sharply defined—just the opposite of the hazy pictures before referred to. *Marjelen Sea* is a very attractive picture, in blue carbon, by Dr. Hamilton. Some floating ice and snow in the foreground, which has come down from the glacier in the hills, attracts the eye by its singular verisimilitude. The whole picture is strikingly realistic. *Lincoln Cathedral*, by Mr. Charles Lord, differs from all the other views of it in that this one gives a good and distinct view of the whole of the three towers. This he was enabled to take through being admitted to one of the adjacent buildings. *The Home of the Artist* is a pretty picture of mountain and flood, by Mr. Kenworthy. *Miss Springett*, a direct portrait by Byrne, of Richmond, is one of the best full-size portraits in the Exhibition.'

Bath Photographic Society.—November 21.—Mr. Pumphrey gave a lecture on the subject of *Italian Cities*. Of course, only the best of photographic views were employed, all of which had just recently been produced by the lecturer and his brother. These included instantaneous and other street scenes, examples of ancient and modern architecture, rural and aquatic views, and other subjects which the lecturer felt would prove interesting. The places visited comprised Turin, Pisa, Rome, Naples, and its neighbourhood, Florence, Venice, Varallo, Orta, Menaggio, Lugano, &c. The lecture was prefaced with remarks concerning some details in the production of the lantern slides, which were collodion positives reproduced from film negatives. These, he said, left nothing to be desired, while they offered the greatest advantages of any method in point of convenience and efficiency for a prolonged tour with the camera. The journey from Bath to Turin was briefly described without illustrations, but at Turin, and thence over the entire route, the lecturer lucidly described the places visited, depicting many scenes which are not altogether in the beaten track of ordinary travellers. The lecture was listened to with marked attention and frequent applause, and at the close Mr. George Powell, who presided, thanked Mr. Pumphrey very cordially.

Dunstable Photographic Society.—This, the only "learned society" in Dunstable, although not yet a year old, has already made its reputation, and its "local habitation" in Anchor Gate has become one of the public buildings of the town. Its meetings have been held with regularity, and platinotype printing, magic-lantern slide-making, enlarging, and other mysteries of photography, have been from time to time, demonstrated by the members. The local press has, each week, fully chronicled its proceedings, and has thus created an interest which, it is hoped, will educate the public taste, and, notwithstanding the wet summer, excursions have been made for the practice of landscape photography. The Society is fortunate in having amongst its most active members, an accomplished professional, Mr. P. Vlako Turner, who, instead of viewing with jealousy the small successes of the amateurs around him, takes an intense interest in all their work, and has constantly placed at their disposal his own knowledge and experience. Dunstable is by no means overdone with attractions, and the formation of this Society has been a distinct gain both to the town and to the district.

Leigh Photographic Society.—November 22, Mr. Miles F. Burrows presided. —The Poetical Illustration Competition was held, and Mr. Burrows was awarded the first prize for *Stepping Stones*, a pretty platinotype; Mr. R. Leigh the second prize for a bromide enlargement. Mr. T. L. Syms exhibited, not for competition, two splendid *genre* studies in carbon, entitled *Blackberrying*, which gained a bronze medal at the Royal Aquarium Exhibition, London, and *The Pedlar*, which was splendidly grouped. Afterwards Mr. Syms gave a practical and most successful demonstration of the carbon process, first transferring the sensitised tissue to opals and drawing-paper, and then washing the pigment out not acted on by the light in hot water. The pictures were pretty, and carbon is known as a permanent process. The demonstrator advised those who wished to try the process to purchase the carbon tissue and sensitise themselves as required, as the ready-sensitised tissue did not keep for any length of time. Mr. H. H. WRAGG proposed a vote of thanks, and Mr. J. H. STEPHEN, in seconding, said he thought that the continued success of the Society due to the absence of formality and the sociability of the members.

Midland Camera Club.—Wednesday last was a members' Lantern Night, Dr. Hall Edwards in the chair.—Owing to the oxygen bottles giving out, a discussion was started on the advantages of a slide made by reduction over one by contact, the Doctor being very emphatic in his opinion, and gave a practical example of his using a gross of plates to get a perfect slide. In the mean time Mr. Baynton had kindly fetched another cylinder from his shop, and slides were shown by Dr. Hall Edwards, Messrs. Baynton, Beaumont, Baker, Cox, Cooper, and Leech. Mr. COOPER gave a demonstration on *Spotting, Trimming, and Mounting of Prints.*

Newcastle and Northern Counties Photographic Association.—November 26, Mr. J. P. Gibson (President) in the chair.—This was one of the special evenings devoted to the enlightenment of beginners in the photographic art. Mr. PARKER BREWIS gave an address on *The Choice of Apparatus.* He showed and explained the use of tripod stands, cameras of various forms, dark slides, lenses, shutters, printing frames, and other accessories. A vote of thanks to Mr. Brewis concluded the meeting. On the next occasion of this kind (December 18) Mr. J. Hedley Robinson will discourse upon *Exposure and Development*, having reference also to the choice of plates, development by pyro, hydroquinone, and the newer developers.

Shropshire Camera Club.—The annual dinner was held at the George Hotel, on Thursday, the 28th ult., the chair being filled by Mr. F. W. Williams, President of the Club for the second successive year, supported by the Mayor of the Borough and the Borough Member H. D. Greene, Esq., Q.C., M.P. After partaking of an excellent repast and the Chairman giving the usual loyal toasts, the MAYOR proposed the toast of the evening, "The Shropshire Camera Club," drawing attention to the progress of the Club from its commencement, some eight years ago, when it held its first meeting in a room lent by its first Hon. Secretary (Mr. W. W. Naunton) to the present day, when, through the increased interest in the art and the great increase in number of members, it had taken permanent rooms at Castle Chambers, comprising a spacious club-room and dark room. He was pleased to see that amongst its members were those who had gained special honours and mention in photographic competition, one of whom had gained medals, not only in competitions held in our own country, but in international competitions abroad, receiving the special distinction of an invitation to exhibit some of his works at the Chicago World's Fair. The Club itself had come off successful in lantern competition occupying second place in all England last year. Their annual lantern exhibitions held in the Music Hall were a source of much enjoyment, and he always looked back upon them, and hoped he might look forward to them, as some of the most enjoyable evenings of the year. In proposing success to the Club, he hoped it would continue its progress, and he had much pleasure in requesting to be enrolled one of its members. The CHAIRMAN, in responding, invited the visitors to join the Club and especially to take part in the work of welcoming the Photographic Convention at their visit to Shrewsbury next July. It was not easy for any one who had not had the advantage of being in a town where the Convention was assembled to fully appreciate a visit from so important and large a body of eminent scientists and great men. It was not only of import and interest to those who practised the art of photography, but to the town at large, and the Council were expecting that the Shrewsbury gathering would be the crowning Convention of all that had preceded it. It was no small accomplishment for the Club that they, after only a few years' existence, should have such a privilege conferred on the town as the visit of the Photographic Convention of the United Kingdom. Mr. WILLIAMS concluded a graceful speeeh with a strong appeal to their guests that night to join them in giving a fitting reception to the Convention. "The Visitor" was proposed by Mr. W. W. NAUNTON, and Mr. H. D. GREENE, Q.C., M.P., in responding, drew attention to the President's remarks, and said he was sure Shropshire would not be behindhand in welcoming the Convention, it being characteristic of the county that, having once taken a thing in hand to carry it out with a determination that not only should it be equal to former events, but, if possible, surpass them. Speaking for himself, as a member of the

invitation committee which he had been asked to join, he would do all in his power to help the movement forward, giving it his personal assistance during the week it was being held. Mr. M. J. HARDING, in responding on behalf of "The Vice-Presidents," humourously proposed by Mr. J. L. Matthews, Clerk of Assize to the Oxford Circuit, referring to the Convention held in Dublin last year at which he was present, said when he heard that the Convention had accepted the invitation of the Shropshire Camera Club to hold its next annual meeting at Shrewsbury, it was with some misgiving following a city which carried out its arrangements on a magnificent scale, but after the words which had fallen from the borough member and the fact that it, the project, had been well received and taken up in the county, such names as Earl Bradford, Earl Powis, Lord Newport, Lord Kenyon, Lord Harlech, &c., being amongst those who were on the invitation committee these misgivings had in a great measure, if not wholly, disappeared; he also thought he might justly claim that in some respects we could surpass Dublin in being able to offer work without the necessity of making long journeys, Shropshire, from the beauty of scenery, both in the immediate neighbourhood of its county town and in the country town itself, offering ample scope for the most enthusiastic worker in our fine art.

FORTHCOMING EXHIBITION.

1895.
March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ANOTHER GROWL FROM THE ANTIPODES.

To the EDITOR.

SIR,—I think in my last letter to you I fell into an error, which I hasten to correct, with your permission. I refer to the discolouration of the paper wrapper in bromo paper envelopes. The discoloured paper with the mottling and dark brown spots, and having also lines showing the folds of the envelope was P.O. paper and not bromide paper, as I think I described it. Of course the developing trouble was with bromide paper. Possibly the P.O. paper was a long time made, and I presume there is a limit to its keeping qualities, but I have not met any so injured in the tubes.

A wrinkle. A piece of open muslin for holding salts, &c., in suspension for dissolution is good, but has the objection that if you leave the ends hanging over the edges of the vessel a quantity of the liquid finds its way on to the table by capillary attraction. I have found a very convenient article for small quantities of material in the wire tea strainers procurable for about threepence; they would be better still if nickel or silver-plated.

Unsatisfactory results and formulæ are often published and republished. I have tried various substances for the preservation of gelatine, starch, and other similar materials. Salycilic acid did not long arrest decomposition, nor did boracic acid. A combination or mixture of gelatine and starch always went bad, even with a liberal addition of spirits of wine, which appeared to injure the adhesive properties.

In writing of the P.O. paper, I forgot to mention that some of my friends will not use alum for hardening the film. They declare it cuts out the fine detail or half-tones, and a few cases of rabid and hopeless fading of my own prints were set down to the use of alum. Has any one else had a similar experience?

By the way, in a lengthy article published some time since upon this subject (the fading of prints), all sorts of courses were suggested by different workers, but not much stress was laid upon a cause which I have to be the most decided, *i.e.*, the mounting boards. I have now prints on albumenised paper taken from twelve to eighteen years ago—mounted and unmounted—most of the mounted ones are yellow, spotted, and vanishing; in fact, perishing fast. The unmounted ones are almost perfect. I have a strong objection to mounting prints I value; what appears to me a preferable plan is to have two light boards (where albums are used) with openings similar to the common portrait album, but, instead of being solid, the two cards would be hinged at the back, and, when two unmounted pictures were placed between these, faces outwards, the cut-out ards would be brought together and fastened either by small paper fastenings or neat silk cords; or, perhaps, three cards or mounts would be better, a solid one between two cut-out ones.

The starch became granular, and would not hold, the gelatine seemed combine with the water, extracting it from the starch, and the spirit also seemed to lose its strength and preservative properties. I have tried the mixture several times—with always similar results.

Bleached shellac.—I have had some of this for months in spirits of wine, but it has had no effect upon it. Can you suggest a solvent (other than an alkali)?

Gum (Dammar?) in Acetone.—Some time ago the journals had a recipe for a varnish for cards of the above composition, I think. I sent to Sydney for both substances and tried to get a solution, but failed. After many moths the gum was intact, but bore a bleached or chilled look.

Nitric ether has more than once been recommended as a solvent for gelatine. I (very sceptically) tested that also, and was not much surprised to find that it did not answer.

Gelatine Plates.—Is there not invariably some substance used to harden the film or cause it to adhere to the plate, instead of frilling all round, or expanding to an indefinite size? I have not met it referred to in the formula generally. This frilling has always failed me.

If any of your readers have overcome the difficulties I have met with and noted, I will be pleased to get a hint, especially if tried in a warm and moist climate.—I am, yours, &c., A. J. SIMPSON.

Lismore, N. S. W., October 13, 1894.

PHOTOGRAPHIC IMPRESSIONISM.

To the EDITOR.

SIR,—I would suggest as a way out of our difficulties in endeavouring to arrive at the meaning of the impressionist's work, as so frequently shown now at Exhibitions, the Salon, and elsewhere, that a print of the subject as it is usually rendered by photographers who admire detail and drawing should in all cases accompany the fuzzy specimen.

This is already recognised in enlargements when exhibited. I make this suggestion as, at a recent meeting of photographic devotees, the mystery of what was intended to be represented in a photograph recently shown at the Salon, was most satisfactorily explained by the production of a negative of the same subject taken by another camera.

The pleasure of having our imagination invoked and wonderment excited by the mysterious prints now so prevalent is greatly added to when we can elucidate the mystery by reference to another print upon which is shown the way out of the maze.—I am, yours, &c.,

FRANK HOWARD.

"BLACK-BALLING" AT THE ROYAL.

To the EDITOR.

SIR,—I should not have cared to address you on this subject, which is necessarily a rather delicate one, had not the rejected candidate himself written to all the photographic papers in the first instance. Even then the matter might have been allowed to drop, but for the letter from the Hon. Secretary of the "Royal," which appears in your last issue, in which he has seen fit to accuse those who voted against Mr. Horsley Hinton of having made a "gross abuse of the ballot," and hinting that they were actuated by personal spite.

Being one of those who did vote against Mr. Hinton's election, perhaps an explanation of my reason for so doing may help to unravel the mystery which has been woven round the matter.

It having come to my notice that Mr. Hinton—whose name was starred in the Exhibition Catalogue as a member of the Society—was proposed for election, I examined my membership list to see if his name was on the roll. Finding it there, I made some inquiries at the offices of the Society, and received the following information:—

1st.—That no notice of resignation had been received from Mr. Hinton.

2nd.—That his subscription was in arrears.

3rd.—That fourteen applications had been made for the overdue subscriptions, and that no notice had been taken of such applications.

4th.—That the Journal of the Society had been sent regularly to Mr. Hinton, and had not been returned.

This official information received at the Society's offices does not accord with the statement of the Hon. Secretary, in a contemporary, that Mr. Hinton resigned three years ago.

If the statements which I have enumerated are not true, a grave injustice has been done Mr. Hinton, and it would be well if both he and Mr. Chapman Jones would let us have their comments on them.

Believing them at the time, I regretfully felt compelled to vote against Mr. Hinton's election, and I have no doubt that others were similarly influenced by the same information, and not by the unworthy motives suggested by the Hon. Secretary and some commentators in the Press.

That there was organized or personal opposition to Mr. Hinton, I do not for one moment believe. Under other circumstances, I should have been only too glad to have supported the election of a man for whose work I have so much admiration.—I am, yours, &c., JAMES A. SINCLAIR.

26, *Charing Cross-road, W.C. December* 1, 1894.

To the EDITOR.

SIR,—I think Mr. Chapman Jones has acted a courageous, not to say honourable, part in denouncing the action of the meeting which was against the true interests of the Society, and his merit is the greater since it is notorious that his opinion is shared by but a comparatively small proportion of the members, both on and outside the Council. It is time something was done to put an end to the mischief done by what may be

termed the anti-Robinson faction; but, while Mr. Jones is in office, we may rest assured that Mr. Robinson and his friends will not lack his support, however they may criticise the Society. I consider the blackballing of Mr. H. Hinton disgraceful, and the alleged reason for it absurd in the extreme. If it be a fact that this gentleman has received the *Journal*, exhibition tickets, and other privileges of membership, whose fault is that? The Assistant Secretary's, certainly. It was not Mr. Hinton's business to correct the Society's errors, or to reply to demands for subscriptions.

If the Exhibition is not better managed in future, it will lose interest with the public. I sent four pictures to last year's Exhibition, politely requesting that, as an old member and exhibitor, they might be hung together on or near the line. One was skied and three were rejected. This year, in consequence, I did not send, nor do I intend to again. No wonder the Salon flourishes if this is the treatment accorded to members of the Society.—I am, yours, &c., AN OLD MEMBER.

December 4, 1894.

To the EDITOR.

SIR,—As one of those members of the Royal Photographic Society who are so violently attacked by Mr. Chapman Jones for making a reality of the right of voting if for once it is used in a manner contrary to his wishes, it occurs to me that, if silence is kept by all those who think as I do, it may be supposed that there is nothing to be said on the other side.

Mr. Chapman Jones implies that there are no circumstances which might account for the blackballing if it were mentioned at the Council meeting at which he was present; and, further, that all the members of Council voted for the candidate, who was subsequently blackballed. Is Mr. Chapman Jones prepared to assert as a fact that which is implied? I will ask Mr. Chapman Jones to point out any rule of the Society which gives the Council power to "blackball" a candidate before presenting his name for election. Further, if some of the Council had decided that they could not give their own votes in favour of a particular candidate, they might yet not desire to arbitrarily enforce their own view by excluding the members generally from a voice in the matter.

What were the reasons influencing the other blackballers (about double the number, I believe, mentioned by Mr. Chapman Jones) I cannot, of course, say. It may be that, in some cases, it was considered sufficient that, if a member leaves the Society * as a protest against its action in supporting the Secretaries in refusing privileges to prominent members not accorded to others, that protest ought to be resented, especially if the protester has since used his literary opportunities to attack the Society.—I am, yours, &c., AN INDEPENDENT MEMBER.

December 4, 1894.

A CORRECTION.

To the EDITOR.

SIR,—I notice that, among the lectures to be given in connexion with the Photographic Exhibition at the Imperial Institute, you mention one by myself on "Photography and Art Reproduction." Will you grant me space to say that this announcement was made under a misapprehension, as I was unable to accept the invitation which was courteously given to me by the authorities of the Institute? I hope, however, that somebody better qualified than myself may be found to deal with the important subject of Photography and its relation to Art, a subject much in want of temperate and impartial discussion.—I am, yours, &c.,

H. T. WOOD.

Society of Arts, John-street, Adelphi, London, W.C.,
December 2, 1894.

PHOTOGRAPHIC COPYRIGHT.

To the EDITOR.

SIR,—The recent decision against Mr. Ellis in his copyright action, seems to plunge this matter into deeper obscurity than ever. A photographic operator in employ of any firm, and receiving a salary for his services, is said to enjoy exclusive copyright in his work, in the absence of any assignment of his right. This is the present view of the lawyers, and at Stationers' Hall they will *not* register without the name of the negative-maker, who they assert is the copyright-holder.

In the case before mentioned, the question was one of fact. Did plaintiff receive "valuable consideration" for work done? and, the receipt of such being proved, it was declared that he (plaintiff) held no copyright.

I should be very glad if some of your readers could inform me wherein lies the difference between a firm's operator in receipt of "valuable consideration" (wages), and yet holding copyright, and the case of Mr. Ellis, who, by virtue of such consideration, was not allowed to claim copyright. I am, yours, &c., J. LIDDY.

London, E.C., November 29, 1894.

* Did the candidate in question leave the Society? His name is down as a member for the current year.

To the EDITOR.

SIR,—Will you kindly make it known through the medium of your Journal, to all whom it may interest, that Messrs. Johnson, Matthey, & Co., of Hatton Garden, have favoured us with a *further* donation of 14*l.* 10*s.* towards the Reserve Fund of the Photographers' Copyright Union, which fund now amounts to 282*l.* Thanking you in anticipation,—I am, yours, &c., HENRY GOWER,

Botolph House, Eastcheap, London, E.C. *Secretary.*
December 4, 1894.

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITOR.

SIR,—With reference to your report of the Council Meeting of this Association in London, on November 9, in your issue of November 23, my attention has been drawn to a letter from Messrs. Marion & Co., characterising your report as "half truth garbled."

I should not have troubled you further in this matter but for the vast importance of the case to all photographic dealers and manufacturers, as well as to the professional photographers of the United Kingdom, who are represented by this Association, and of which I have the honour to be Secretary.

Mr. Baker knows nothing of this letter, which I write (reluctantly) solely in my official capacity.

After one has waded through Marion & Co.'s piece of "special pleading," which is, as Hamlet would say, merely "words, words," the facts in your report remain as they were stated, and Marion & Co., in their own letter above named, admit both facts and details. The high reputation of Messrs. Johnson & Co., the solicitors acting for Mr. Harold Baker (the late Mayor of Birmingham being senior and active partner) is sufficient guarantee that no "threatening letter" was ever written them in the sense conveyed by Marion & Co.

Harold Baker is well known to be one of the most courteous men in the profession, and one of the mildest-mannered men in Birmingham. From Marion & Co.'s own letter it is evident that they have been dealt with all through in a courteous and businesslike manner. They say that "Mr. Baker treated them with marked courtesy." They say that "they did not reply to the solicitors' letter." Well, the strongest letter which followed, and of which they complain, was the natural result of their action. They say that the photograph on card, hawked about by the barrow-men, with Harold Baker's name on the back, "was a copy of one of Mr. Russell's prints," a copyright picture, in fact, of the Duke and Duchess of York!

The real difficulty still remains, that it is not possible for Harold Baker to ascertain, as Horatio would say, "to what base uses" the defective mounts have been, or may be, applied, and he is utterly powerless to protect himself against such things.

Marion & Co. admit the case by saying "it was sufficiently grave to be taken seriously; and they say further, "For years we have been in the habit of clearing out such wastes;" also, as the inevitable result of "clearing out," "there is a danger of printed mounts getting about." Precisely! a certainty, in fact. Macawber would say that way of stating the case "was not putting too fine a point on it."

Marion & Co.'s suggestion as to the barrow-man's specimen card which was produced when the would-be purchaser called on Harold Baker, was, "After all it is but a supposition that this mount came from us. It might just as well have come from Harold Baker!" A suggestion which only aggravates the facts!

What would Marion & Co. have thought if a dealer in such articles called on them, asking their prices, and submitting such a derogatory specimen, with Marion & Co.'s name on the back?

Marion & Co. have, by their own letter, "given themselves away," and admitted the facts in your report. However, it is pleasant to read their promise now, "In future we have determined that every waste mount shall be destroyed by ourselves."

As to Marion & Co.'s complaint of "loss of time, and the expense of a journey to Birmingham and back," all this would have been easily avoided if they had sent a prompt reply to the solicitors' original letter, when, no doubt, the case would have been settled promptly and finally. Let us have facts, not "truth, half garbled."

Marion & Co. say they promised that day, in Birmingham, at Harold Baker's studio, to find, and destroy, the cards which were being thus hawked about, "it being settled between us." Mr. Baker wanted the predominant partner (as Lord Rosebery would call him) to go to the solicitors.

This is incorrect. There was *no settlement whatever* until the visit to the solicitors, *and then* only after much discussion! Harold Baker would have acted very stupidly to have taken the case out of his lawyers' hands. As stated in your report, "an agreement, *pro tem.*, was made, staying proceedings." *The settlement has yet to come.*—I am, yours, &c.,

47, *Charlotte-road, Birmingham.* D. J. O'NEILL,
Secretary N.A.P.P.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

I will exchange one 3d patent Dallymeyer for one Marion portrait lens, three and a half inch diameter.—Address, H. LISTER, Photographer, Darwen.

Wanted, light sketchy background in exchange for grass mat, 8 feet by 6 feet.—Address, A. BETTS, Photographer, Merthyr Tydvil, South Wales.

Wanted to exchange a Zoka hand camera and flash-lamp with three wicks, for a vice for picture-frame making, tripod, or slides for Griffith's hand camera.—Address, J. COX, 26, Edward-road, Clarendon-park, Leicester.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

C. OAKESHOTT.—Not received. The ALMANAC is published.

T. G. S.—1. Received. 2. Have nothing to do with the firm referred to.

G. E. ARNOLD.—Thanks for your communications. We are aware of the peculiarities of the firm referred to.

A. STACEY.—As we do not know how the negative was intensified, we can offer no opinion as to the safest method of reducing it.

A. M.—1. You are probably referring to Mr. T. Samuel's new patent film-changing box. It is not yet, we believe, commercial. 2. Yes, in due course.

ASSISTANT.—1. There is no society in existence for the "furtherance of the interests of *bonâ-fide* photographers' assistants." 2. We should advise you to enumerate your qualifications in an advertisement.

C. J. A.—There is no patent in connexion with the direct carbon printing method recently referred to. Any one is free to make the paper for his own use, or put it upon the market if he thought it worth his while.

EDITH.—Messrs. Tunny & Co., Edinburgh, will, no doubt, supply them. Potassio-chloride of iridium may be had from Hopkin & Williams, Cross-street, Hatton-garden. The price is somewhere about 6*l.* per ounce. It is an expensive salt.

AN AMATEUR.—Any old manual of photography of, say, twenty years ago, will give you full instructions. A series of articles on the wet collodion process appeared in the JOURNAL in the early part of the year. Have you overlooked them?

T. BOWERS.—If the mackintosh cloth of the bellows shows a tendency to stick in the folds after the camera has been closed up for a time, it should be well coated with French chalk before the camera is stowed away for the "long vacation."

D. O'MALLEY.—In making matt varnish by the formula given in the ALMANAC, the coarseness or fineness of the grain is governed by the proportion of benzole. The larger it is the coarser and more open is the grain. The varnish should be applied to the cold negative.

S. A. B.—It is doubtful if the prints can be removed now without injury. It is very little trouble to make fresh prints—less than would have to be expended in trying to get the present ones off the glass. Gelatine prints should be treated with alum before they are squeegeed upon the glass, so as to make sure of their coming off easily.

CONSTANT READER (Pontypool).—If the instructions were followed, the prints would not turn green. The only way by which we can account for their doing so is careless manipulation, probably unclean dishes, or very impure materials. Very likely the first washing waters were contaminated by hypo-sulphite of soda or other deleterious matter.

SIDNEY ROBERTSON.—Starch is the mountant most generally in use amongst professional photographers. Some have an idea that it is not a safe mountant, while others say it is the best that can be used. For our own part, we prefer a pure gelatine solution as being most conducive to permanency; but it must be confessed that it is not so convenient to use as starch paste. If it were, we doubt not that it would be more frequently employed than it is.

A. E. G.—1. We could not say without trying. Rotary burnishers are generally used for the purpose. Could you not take a few prints to some one who uses the other form of burnisher, and see if the result satisfies you? 2. Supposing the glass side of the studio faces north, or somewhere about that point, the design and proportions will do very well, except that four or five feet longer would, at times, be found more convenient, as in taking groups.

NEMO.—The spots on the prints forwarded have all the appearance of having been caused by air-bubbles adhering to the paper when they were first immersed in the fixing bath, and so preventing a free action of the solution, or, maybe, by air-bells sticking to the prints when they are put into the first washing water. In cold weather, air often adheres very tenaciously to the surface of prints, is difficult of removal, and its non-rapid removal is a prolific source of spots similar to those in question.

BON CAR.—The object of the article, as intimated, was to point out to experimentalists the conditions of working necessary to obtain the best results, and not give working details. Any colours that may be desired can be used, provided, of course, that they are in a fine state of division, and are not affected by the bichromate salt. The pigments supplied by artists' colourmen for water-colour painting answer well. Tube colour is a convenient form to purchase, or they may be had in fine powder. Any good paper will answer.

A. G. writes: "I shall be much obliged if you will kindly give me information on the enclosed subjects:—1. I have a lens from which I wish to remove some rather deep scratches. Can you tell me if I can do this myself, and how, or must I send lens to maker? 2. Tell me of a 'spotting medium' for spotting chloride prints previous to enamelling."—In reply: 1. The only way to remove the scratches is to regrind and repolish the lens. This you can do yourself, provided you are *au fait* with lens-grinding, and have tools of the proper curves—not otherwise. The lens had better be sent to the optician who made it. However, as a matter of fact, the scratches do not impair the working of the instrument, except by a very slight loss of light. 2. Most of the dealers supply such mediums. Mr. Rudowsky, 3, Guildhall-chambers, has special colours for the purposes.

VENT PEGS says: "Two years ago I purchased a business, including negatives. A few months ago a party who consider themselves aristocrats in our neighbourhood called, and asked, Had I any negatives of their deceased brother, who was taken by my predecessor? They took the negatives (three in number) away with them, and promised to remit amount by their servant the following day, which did not come to hand. I made application a few weeks afterwards for amount when I received a letter from their solicitor, saying that I had no 'property in the negative,' and looked upon my application for payment as an attempt at extortion of money.' I have entered an action in the county court, which is now proceeding, and their defence is that my predecessor was paid for his work, and that the negatives were their property. Could you kindly give me instances of cases, with dates and Judges' decision on ownership of negatives?"—You have a clear case, so far as we can see, as the negatives are your property. Communicate with the Secretary of the Photographers' Copyright Union (Mr. H. Gower) London Chamber of Commerce, Botolph House, Eastcheap. That gentleman will, no doubt, cite you cases in which the point has been decided, and give you further assistance. Read the circular of the Union in our last issue and a sub-leader upon it in the present issue.

MECHANICAL says: "I wish to block out negatives of machinery *after* varnishing, but find that I have the utmost difficulty in this case to get the stopping-out medium (Indian ink with a little gum added) to take to the varnished film. However dense it may seem on application, in a few seconds it appears to detach itself into an uneven mass with fine, hair-like clear channels all over. The same remark applies to Bates's Black and various other experimental liquids I have 'manufactured.' My negatives are all very valuable (15×12), and, if from your seemingly inexhaustible fund of photographic dodges you can put me on the right track, you will confer a great favour. What I want to do is this: 1. Varnish my film for protection first (Mawson's Hard). 2. Stop out with something that will flow easily from a fine drawing pen, and which will dry dense and even. 3. Some means of protection to the stopping-out. How would revarnishing do? 4. I use French curves for getting the curves of wheels, &c. Can you suggest anything quicker and better?"—1. No better varnish for the purpose. 2. Bates's Black or similar varnish is what is generally used. It flows better and takes well to the negative varnish. Indian ink is not easy of application; it is usually applied to the finer parts with a fine sable pencil. Want of experience seems to be the difficulty. 3. If black varnish be used, no protection is needed. 4. Usually the parts are traced round with the fine sable pencil, and the broader portions filled in with a larger brush.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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OUR 1895 ALMANAC.

The British Journal Photographic Almanac for 1895 is now published. It consists of 1344 pages, and is the largest of the series yet issued.

The editorial article is devoted to "By-paths of Stereoscopic Photography," and among the contributors to the volume are Professor W. K. Burton, Dr. R. L. Maddox, Mr. Andrew Pringle, Mr. W. B. Bolton, Mr. R. H. Bow, C.E.; Mr. Bolas, Mr. C. H. Bothamley, Mr. G. Watmough Webster, Mr. E. W. Foxlee, Mr. Thomas Bedding, Mr. John Howson, Mr. Redmond Barrett, Mr. George Mason, Mr. William Brooks, Rev. F. C. Lambert, Mr. A. L. Henderson, Mr. W. J. Stillman, Canon Beechey, Mr. B. J. Edwards, Mr. Chapman Jones, and over a hundred others.

The frontispiece is a print on Messrs. Elliott & Sons' "Barnet" bromide paper from a negative by Mr. James Bacon, of Newcastle-on-Tyne, and, in addition to many other illustrations in the volume, there will be found reproductions from negatives by Mr. J. A. Hodges and Mr. James A. Sinclair, and a specimen of photo-chromographic block-printing (direct three-colour process) by Messrs. Waterlow & Sons, Limited.

SPECIFIC GRAVITY AS APPLIED TO PHOTOGRAPHY.

When writing on the subject of specific gravity some seven years ago, we spoke of the advantage arising from the photographer testing the strength of certain of the solutions he employs by means of the hydrometer, by which the specific gravity, the real strength, could be ascertained at a glance. Seeing from a query we have received this week that a considerable amount of ignorance prevails as to what is really meant by specific gravity, and by what means the relative weights of solid bodies and strengths of fluids can be known by the application of its agency, we purpose indulging in a little plain talk as to the meaning of the term and its application to solids and fluids.

The term "specific gravity" means the density of any substance compared with that of any other substance, distilled water at a definite temperature forming that "other" substance which is the standard of comparison. This applies not alone to liquid substances, but also to those that are solid, such as the various metals and the various kinds of glass, nearly all of which have different degrees of specific gravity.

As regards the testing of fluids there is a close analogy between the two methods of doing so, (*a*) by the specific gravity bottle, and (*b*) by the hydrometer. The former is a bottle capable of holding a thousand grains of distilled water at a temperature of 63° Fahr. Of course, it may contain only 500 grains, which is the dimension of one we frequently prefer to employ as giving equal accuracy with the other, and not necessitating the use of so much fluid, but only the simple act of multiplying the results by two. To apply this to testing the strength of alcohol or ether is a pretty and highly educational experiment, and one that to a maker of collodion must prove valuable.

A specific-gravity bottle, having, as the best of them have, a very small hole running quite through the stopper from end to end, and capable of containing five hundred grains of water at the above-mentioned temperature, after the stopper is inserted and the excess of liquid escapes through the hole, is placed in one pan of a pair of scales, and in the other pan a weight which has previously been adjusted to accurately counterpoise the empty bottle with its stopper. To this counterpoise are added five hundred grains, and it will be found that the beam of the scales will stand at a dead level. Now, the water being poured out, and the bottle rinsed with strong alcohol, which is then poured away, it is filled with absolute alcohol, and will be found to weigh 0·795 or ·796, the actual weight being doubled, for, as before stated, we are operating with a bottle capable of containing only five hundred grains of water. Alcohol having great affinity for water, one need not be surprised if the figures obtained are in excess of this, especially if it is exposed to moist air for a brief period. If now a mixture of water and alcohol be weighed in the same way, it is quite easy to detect the degree to which it has been diluted. For example, the rectified spirit of wine obtainable in commerce is usually stated to be fifty-six over proof. This, when weighed, will show ·8376 as the specific gravity of the liquor thus diluted, "proof" spirit being represented by ·9200. The nearer the specific gravity approaches to 1·000 the weaker the spirit becomes. We may here mention as a point of interest that what is considered the *best* whisky (which is only diluted alcohol) is about fifteen per cent. under proof, or ·9374 sp. gr., when sampled as supplied.

The strength of ammonia may, in like manner, be ascertained from its specific gravity. Although ·880 sp. gr. is considered very strong and good, containing, as it does, 33·117 per cent. of pure ammonia, yet it is not the strongest that is possible to be made, for there is some the specific gravity of which is ·875,

containing 34·694 per cent of pure ammonia. Liquor of this strength is used in some freezing machines, but is sometimes rather difficult to be procured.

It is much less troublesome to ascertain the specific gravity of a liquid by means of an hydrometer than by the bottle. To do do this it merely suffices to pour the liquid into a glass jar, and then immerse the hydrometer, the zero point of which is so determined that it sinks to the level of distilled water. The denser the liquid, or, in other words, the greater its specific gravity, the higher will be the zero mark above the surface of the liquid. It is usual to have hydrometers graduated for the special purposes to which they are to be applied. Thus the well-known argentometer, for testing the specific gravity of solutions of nitrate of silver, is merely an hydrometer so scaled as to indicate the number of grains of the salt in solution per ounce of water. So with the lactometer for testing milk, and the ammoniameter for testing ammonia. The specific gravity of every fluid substance can be ascertained by the hydrometer. By its agency solutions of salts, such as oxalate of potash, sulphate of iron, carbonate of soda, hyposulphite of soda, and, indeed, of everything used by photographers, and capable of being dissolved in water, may be made of any definite strength, and without scales or weights. So may the strength of acids and ethers be ascertained.

A few words will suffice to explain the method of ascertaining the specific gravity of solid bodies, such as metals or glass. The substance, whatever it be, is not allowed to rest in the pan of the scales, as usual, but is allowed to depend from it for a few inches, being sustained by a filament of silk, one end of which is attached to the pan of the scales. The weight is very carefully noted, and a memorandum made of it. A glass of water is then brought below the scales, and the substance gently lowered into the water, and the weight once more observed, this being now lower than when its weight in the air was noted. By comparing the one weight with the other its specific gravity is ascertained. To do this, divide the original weight in air by the loss of weight in water; the quotient is the specific gravity.

QUICK CHRISTMAS WORK.

By the time these words come into our readers' hands, there will be little more than a week to get through all work required for Christmas, and, as we learn from professional portrait and landscape workers, every year shows a growing demand for portrait pictures and pretty pastoral bits, for sending in lieu of the time-honoured "Christmas Card," to friends all over the world. It rests with photographers themselves to increase this demand, by offering every facility to their clients. But what, as a matter of fact, is the extent to which they do "lay themselves out" for this kind of business, which, as every stationer will bear witness, comes with an increasing rush at this time of the year each day that Christmas is neared? Judging from what we can see, the provision made consists, in the majority of cases, of the utterance of excuses for slow execution of orders on account of dull printing weather, and complaints of the delay in giving sittings, or placing orders for replicas—all very desirable utterances as far as they go, but not bringing any grist to the mill. The consequence is that, at a time of commercial depression hitherto unexampled, as far as we can learn, in the ranks of photographers, money that is ready to be poured in their coffers is, actually, entirely needlessly directed into other channels of no benefit to photographers.

Our present purpose is, not to describe new methods, but to point out how some, perhaps many, smart business men still make the present the busiest and most profitable time of the year. What is wanted in trying to make a move is, in the first case, to encourage people to order pictures where previously they have been told it is impossible to execute commissions given late at this time of the year—a rather difficult undertaking, and one which will not be so successful the first season as it will on after Christmas times.

The orders obtained, the point next to be considered is how they are to be executed.

Let us first take orders for very large numbers from one negative at a "manufacturing" price. Here, of course, the very highest class of work possible cannot be expected; but, by means of one or other of the Collotype processes, prints at a low price, and of really good quality, may be obtained through one of the many firms as advertised in our ALMANAC, who undertake this class of business for professional photographers. Then, again, as every student of the illustrated papers of the day is aware, "process blocks" are now made exceedingly quickly, which, when properly printed on suitable paper, give results of high artistic value, often, indeed, with effects really superior to the best silver print the negative would produce. There are (again referring to the advertising pages of our ALMANAC) many process workers who will gladly do this business from beginning to end for photographers in business.

Passing now to what we may term home-produced photographs, the old albumenised paper print, or the modern gelatine "printing-out" paper are, when printed out, quite out of the question for the particular purpose we are discussing. Platinotype is a little better, as it prints so much more quickly than silver. A development process is a necessity. We hear little of the experience of those who have tried the development of printing-out papers faintly printed only, though here an immense gain is promised at the outset—an output of at least five times that obtainable under ordinary conditions. The plan which must be adopted where a few dozen prints are required in a single day is a bromide-paper process, and of these there is an *embarras de richesse*—papers matt, papers glossy, papers smooth, papers rough, in all degrees, from that of an ordinary Rives surface to the roughness of a Whatman drawing-paper. By contact printing, gas or lamplight only being needed—being, in fact, preferable—an average of from thirty to sixty prints an hour from one negative may be easily exposed, and the development carried out in an equally short time. When a paper suitable to the negative is chosen, prints of a very high order may be produced, a little colder in tone, it is true, than is usually preferred in silver prints, but still possessing rich blacks and pearly greys, prints running ordinary albumenised paper ones closely enough to satisfy the most exacting. Some of these, again, may be toned, but this matter we would rather not at the present time discuss, as some of them depend upon what can only be characterised by the old term—whatever it may really mean—"sulphur-toned," though, *pari passu*, there are others free from objection.

Then, when extreme urgency is shown, it is necessary to dry and mount quickly. The quickest washing will be done by alternate placing in fresh water and squeegeeing. Less than an hour suffices. This is followed by a final squeegeeing

on glass to get rid of the maximum of water, and the prints are next transferred to methylated spirit—twice over for extreme rapidity—and then hung up to dry, after which they may be mounted in the usual way. We may here caution the tyro at this work that he must be careful not to hurry the drying by heat, or he may melt the print; and, also, that gelatino-bromide prints when wet must not be treated with the same vigorous rubbing down that may be safely given to albumenised prints, or they may adhere to the protecting paper.

In conclusion, we may say that, if those of our readers who have not taken up bromide contact printing will do so, they will find Christmastide a time of over-pressure of business rather than of lamentations of its absence.

A Novel Painting.—At the last meeting of the British Astronomical Association, Mr. Sydney Hodges exhibited an oil painting of the surface of the moon as it appears through a powerful telescope. The relative positions of the craters, the artist explained, he took from photographs, and then completed the picture from actual observation. Mr. Hodges said that he had always been fascinated with the beautiful silvery whiteness of the moon, and that had induced him to depict it on canvas. This is, we think, the first time that a portrait of the moon has been painted as a purely artistic work and quite apart from scientific considerations, although accuracy has been retained.

The Shrewsbury Convention.—The report of the Shropshire Camera Club's annual dinner, which we printed last week, shows that the local Hon. Secretaries and the inviting Society for 1895 are early in the field with arrangements for next year's Convention meeting at Shrewsbury. Instead of being deterred by the remarkable success of the Dublin meeting, Mr. Martin Harding, Mr. Naunton, and their colleagues seem determined, if possible, to "go one better" than our Irish friends, and we have no doubt that this excellent spirit will lead to a highly successful meeting. It augurs well for the future of the Convention when so much in the way of emulation and healthy rivalry animates its friends.

The New Element.—The *Times* of Friday last comments somewhat strongly that, at the meeting of the Chemical Society the night before, there was nothing forthcoming about the new element, and that not one of the men known to have been engaged in working at it came forward to give information as to results so unequivocally proclaimed, as it was expected they would. It is now five months since the announcement was made at the meeting of the British Association, and the President of the Royal Society, in his late Presidential address, treated the discovery as fully authenticated, and also characterised it as the greatest scientific event of the year. With these facts before us, chemists are naturally desirous of knowing something more on the subject. It seems, however, that the discoverers of the new element are not anxious for discussion on the matter, and prefer to preserve the greatest reticence about it. The "new element" has been dealt with in different ways in Continental scientific journals, in some instances with great levity; indeed, a name has been found for it on the Continent, namely, "Oxfordgen." Any how, the scientific world is naturally interested to learn something about the substance whose principal characteristic was termed "its singular inertness," and which has been so loudly heralded.

Bleached Lac.—In our last issue Mr. A. J. Simpson, in a "Growl from the Antipodes," says he has had some bleached shellac in spirits of wine for some months, but it has had no effect upon it. Mr. Simpson's is by no means an exceptional experience with bleached lac that has been kept for a long time. In the process of bleaching the resin is materially altered in its character. If it is kept for a long time, it "perishes" and becomes insoluble in alcohol, although it was freely soluble in it at first. If the lac be kept dry, it quickly becomes brittle and cracks on the surface; but, if it be kept moist, say, in a jar with a little water in the bottom, the brittleness will be avoided, but in time it loses its solubility, sometimes within a few months, and sometimes not for a year or two. If the same lac be kept unbleached, it will neither become brittle nor insoluble, however old it may become. It will be readily understood that the character of the resin is altered by the bleaching process, which is this: The lac is first dissolved in a hot alkaline solution, then a solution of hypochlorite of lime or of soda is added to destroy the colour, and afterwards the whitened lac is precipitated with acid, sulphuric or hydrochloric, and finally washed. It is then thrown into hot water, softened, and worked into the form it is met with in the market. The commercial white lac frequently contains free acid and also chlorine, both very objectionable materials in a negative varnish, particularly for gelatine plates. Unbleached lac has often been recommended in these columns in preference to the bleached for negative varnishes, and there can be no question about its superiority for the purpose. The only objection to it is the colour, but that is more imaginary than real if "pale orange" lac be used, for, if a portion of a glass plate be coated with a negative varnish made with orange lac, and a part with one made with white little or no difference will be detected.

International Copyright.—A case of considerable importance in connexion with International Copyright Law was decided in the Court of Appeal on Thursday last week. Briefly, the case is this: The plaintiff, Herr Franz Hanfstaengl, is the well-known art publisher in Munich, and some time ago he published photographic copies of a picture entitled *The Love Letter*, of which he claimed the copyright. The defendants are the American Tobacco Company, trading in London, and they reproduced the work, and used it as an advertisement in connexion with their tobaccos. The reproduction was admitted, and the contention was that the work was not copyright according to the International Copyright Act, which Act gives the signatory countries under the Berne Convention the same rights in foreign countries as they enjoy in their own. The picture in question was painted in Florence, and sold, together with the copyright, to an Italian picture-dealer, who subsequently sold the latter to the plaintiff, who afterwards published the reproductions. The case, as tried by Mr. Baron Pollock some months ago, turned very much upon the terms "production" and "publication." The picture was publicly exhibited in Italy, but no copies of it were made there. According to Italian law, registration is necessary before publication; in Germany, where the copies were first issued, it is not. Mr. Baron Pollock ruled that the case was decided by Italian law, Italy being the country in which the picture was first produced within the meaning of the International Copyright Act, and gave a verdict for the defendant. Against this the plaintiff appealed, and the issue was tried before the Master of the Rolls, Lord Justice Lopes, and Lord Justice Rigby. In the end, the Court held held that, under the International Copyright Act, "first produced" means "first published," and that was done in Germany, and therefore the appeal was allowed. The three Judges were in accord on the subject. The International Copyright Act is a great boon to artists and publishers, but in details it requires amendment. Of that we may have something to say anon, as there are other cases pending under it which have soon to be decided.

PROFESSIONAL PHOTOGRAPHERS AND DEPRESSION OF BUSINESS: AMATEURS.

IV.

I MUST, in the first place, repeat my fears from what I have continually occasion to remark in other departments: First, that too many, when they once suppose themselves to have learned photography, settle down into a mere mechanical routine, which leaves them always very nearly where they began; second, that very many

are apt to consider chiefly, often exclusively, only the *money profit* on each separate transaction. I do not say there are not cases where this may be the truest business principle, and there may be photographers who are unable to do otherwise or who elect to depend on a mere catch-penny business; what I have written is not intended for them.

My next remark is that, if you are busy working on such lines as I have previously described, you need not trouble yourself about the much-dreaded amateur. You will scarcely find time or inclination to give your thoughts to him. If, however, he should come in your way and you are able to gain any advantage from him, there is no reason why you should not do so. It may be one of those who, like "dear Richard," resolves at least to get his negatives printed by the professional, perhaps also, in due time, negatives developed and prints mounted.

There is one more thought that may add to the encouragement which I hope you find in much that I have already said, and still further quicken your efforts to reach the state where *you* may have little cause to complain of the *depression of business*. At the commencement I pointed out the causes at work tending to limit the demand for photographic productions, by diminishing the funds that can be properly applied to their acquisition. However, alongside of the prudence which this state of things is calculated to engender, another sentiment, working in the opposite direction, has on many minds a great influence. "A thing of beauty is a joy for ever," especially when it is such as to recall vividly to the mind that around which many of the fondest affections are entwined. Even without this latter consideration the influence of the feeling remains very considerable.

In my more recent visits to London, indulging in my weakness for looking into shop windows, I have been struck with the beauty of many objects of common usefulness as compared with anything that could be seen twenty and more years ago. I have supposed that this may be partly due to the schools of art that were established all over the kingdom as one of the results of the first great Exhibition combined with the enormous competition that has been everywhere springing up. English manufacturers have felt the need, unless they were willing to be beaten out of the field, to place themselves and their productions among the *fittest*. By the means they have used, they have secured to themselves the chance of supplying these things where the *need* of them exists. But this is not all. I feel sure that many people, who really have not the *need*, and who doubt whether their means warrant spending more money on such objects, are, nevertheless, often induced to buy them because they are attracted by their beauty. Thus the very perfection to which such things are brought exercises a powerful influence in creating a demand for them, We cannot suppose that this kind of influence will prove less potent in reference to photography, where, as I said, the "thing of beauty" derives an additional value from the affections entwined around the object which it represents. Therefore, from this point of view also, the improvement in their productions, which all should constantly aim at, tends to provide a powerful antidote to that depression in business of which many complain. And now I must really take leave.

If at some later period I pass near some studio, and am led to enter, and if, finding myself not regarded as an intruder, although I must confess myself only an amateur, my curiosity should lead me to inquire into the state of business, I hope I may learn that it is very flourishing. If I have that satisfaction, I may be interested to learn, farther, whether it has always been so, and, if not, to what proceedings the change is due. There will always remain in the profession a sufficient number of those who, having entered it too rashly, and having neglected the means within their reach, will never have known their business otherwise than depressed unless, at the beginning, they had received it flourishing from some one else. These may still deservedly have to complain of depression of business.

W. WASHAM.

ON THE CAUSE OF THE FADING OF ALBUMEN PRINTS.

[London and Provincial Photographic Association.]

ON August 3 last year Mr. Grundy and myself contributed a paper to this Association on *The Amounts of Silver and Hypo left in Albumenised Paper at Different Stages of Washing*. The object of that research was to endeavour to find out how long, under given conditions, it was necessary to wash prints in order to eliminate all soluble salts; and, secondly, to ascertain, if any, the amount of silver left in paper after it had been washed for stated times.

I need not trouble you again with a description of the method we adopted, but have placed on the board the results we obtained. The point I wish to draw your attention to this evening with regard to that paper is that, after hypo and water have done their level best to dissolve out salts of silver and hypo, there is left in the paper a certain portion of the precious metal, which cannot be removed.

The weight of metallic silver in the paper after washing and previous to fixation was found to be ·0734 gramme per quarter sheet; after fixation and working, when the quantity became constant, the quantity was ·0037. By a simple rule of three we arrive at the result that five per cent. of the insoluble salts of silver in the high lights, previous to fixing and washing, remains in those parts.

A sheet of paper measures 22×17 inches, and has left in it $\cdot0037 \times 4 = \cdot0148$ gramme, or a little less than a quarter of a grain of metallic silver. This does not seem a large amount when spread over 374 square inches, the area of a sheet the above dimensions, and its thickness would not exceed the $\frac{1}{4000000}$ of an inch. Some idea may be formed as to what this thickness means if we compare it with the thickness of gold leaf. One grain of gold, by mechanical means, can be made to cover fifty-six square inches; its thickness is then $\frac{1}{282000}$ inch, so that the thickness of the silver would be about $\frac{1}{14}$ of the thickness of gold leaf.

The thickness of the silver being so small, it would, at first sight, seem incapable of producing any visible effect, *i.e.*, stopping light when placed on a white surface.

In order to test by chemical means the existence of silver in the albumen, I took a print that had been produced over four years, and to all appearance had not changed. This was divided into two portions, and, to one of these a solution of sulphuretted hydrogen was applied; almost at once the whites changed to a yellowish brown. Freshly prepared paper, fixed and washed, changes in identically the same manner.

The yellowing of prints is frequently ascribed to the combined action of light and moisture. Light I find to produce a bleaching action instead of a darkening or yellowing. In order to test this, I placed a piece of fixed and washed paper behind a circular opening cut in a piece of black paper, placed them in a printing frame, and exposed them to light. At the end of a few hours the exposed portion was perceptibly lighter than it was before, and at the end of eleven days, during which time the sun was shining on the paper, there seemed to be no further blackening. From this I conclude that light plays no part in the yellowing or change of colour in prints which have been as completely fixed as our present mode of operating will allow as to remove the sensitive silver compounds.

Judging from the specimens in the show-cases of photographers on the coasts, it would seem that sea salt, combined with moisture and heat, produces rapid yellowing of the high lights of prints. In order to test this, I soaked a piece of paper in a dilute solution of common salt, absorbed the surface moisture by means of blotting-paper, and placed it side by side with another piece of similar paper, excepting that the latter had not been treated with salt, in a wide-mouthed bottle containing a small beaker of water.

At the end of six days no perceptible difference was noticeable between the two pieces.

Unsensitised albumenised paper turns yellow when exposed to the action of ammonia gas, and water. This may account for the fact that fumed paper alters to this colour, independent of the presence of silver salts. The yellowing of prints in the high lights might therefore take place, under certain conditions, though no silver be present in the paper.

Photographers are, as a rule, practical men, and do not care much about figures or a simple chemical reaction, and, to tell a practical photographer that five per cent. of the insoluble salts, before fixing, are left in the high lights of the paper when the picture is complete, does not convey much information, nor yet does it convey to many any idea of the amount of silver present when they are shown a yellow stain produced by sulphuretted hydrogen or one of the alkaline sulphides. The two following experiments, however, I think, will appeal more forcibly to the minds of practical men, as they can be carried out by any one who will take the trouble. In the one case the metallic silver itself can be extracted from the paper and brought to view, and, in the other, the usual colouration due to light shown.

In order to extract the metallic silver from the fixed and washed paper, I took a quarter of a sheet, tore it to pieces, placed it in a beaker, then added some strong hydrochloric acid and water, saturated the whole with common salt, heated the contents of the beaker to about 50° C. for a quarter of an hour, and filtered the solution warm. Hydrochloric acid and common salt are both, to a small extent, solvents of salts of silver, especially in concentrated

solutions. If there be present in the paper any salt of silver, it will be dissolved by these two bodies. The clear solution, after filtration, was boiled for a short time to expel the greater portion of the hydrochloric acid, and a piece of clean, bright copper was added, and heat again applied. After about a couple of hours' boiling, the copper foil was covered with a layer of metallic silver sufficiently thick to completely mask the reddish colour of the copper below. This, I think, would be a very good method to test qualitatively as to whether any particular system of working yielded prints the high lights of which are absolutely free from silver compounds. All that would be necessary to be done would be to fix and wash at the same time with the prints a piece of sensitised paper that had not been exposed to light, and then to treat this test paper as described above. If the amount of silver in a quarter sheet was only one quarter of what was found by analysis, it would, I think, give clear indications of a silver deposit on the copper.

There are many other methods that could be adopted, but this one requires no particular skill and does not involve the use of poisonous materials or materials that do not already exist on the shelves of all photographers.

The next method, that of printing out an image on the silver left in the high lights, is perhaps the most conclusive of all of the real existence of a silver compound left in the high lights of finished prints. In order to do this, the paper, after being fixed and washed, was soaked in chlorine water for about five minutes. The object of this was to decompose the salt or salts of silver in the paper, and convert them into silver chloride; but, as you are well aware, silver chloride prepared under such circumstances darkens but feebly under the action of light, and in order therefore to make it sensitive it is necessary to bring into contact with it during exposure some chlorine absorber; the most handy substance was nitrite of potassium. I mixed a two per cent. solution of this salt, and, after washing out all the chlorine, brushed this over the surface of the paper. I expected to see a very feeble image produced on exposure to light, but the density of the image will, I think, astonish all who see it. It printed up to the density you see in sunshine in about ten minutes. From the analysis of the paper it was impossible to say whether silver was in the pulp of the paper or in the albumen. In order to test this point, I applied the nitrite to both sides of another piece of paper, and, before exposure under the negative, folded back a portion so that albumen came in contact with albumen. When this was placed in contact with the negative, the light could act directly on the albumen of one part of the paper, and on the paper of the folded portion, so that, if silver existed in both albumen and paper, an image would be produced on each, and, if on the albumen only, the image would be limited to the albumen surface. The action of the light was to produce an image on the albumen only, and, where the two albumen surfaces came into contact with each other, then we have on opening the paper the one image reversed as regards the other. Such an image can be washed and fixed in the ordinary way without great loss of vigour.

With such evidence before us of the existence of a sufficient quantity of silver in the high lights of albumen prints to produce such distinct images as I have shown, is it astonishing that silver prints, after a very short time, turn yellow and then fade? It would be marvellous if silver prints on albumenised paper did not turn yellow when we consider the impurities in the shape of sulphur compounds that exist in the atmospheres of large towns, in consequence of the enormous quantities of coal daily consumed. Coal, on an average, contains about one per cent. of sulphur, and some of this, when the coal is burnt, exists in our atmosphere as sulphuretted hydrogen. Effects we are able to produce in a few seconds when using a solution of sulpheretted hydrogen require many minutes when the gas is used, and months or years when the prints are exposed to impure air; but though the action is slow in the case of sulphur-contaminated air, it is sure, and the silver that is there must finally be converted into sulphide; and it is this silver sulphide, I think, which is the true cause of the yellowing of the high lights of prints.

Mr. Grundy and myself have for some time past been working at the elimination of this last trace of silver from the albumen surface, but up to the present, I am sorry to say, with little success. We have tried hypo, strong, weak, hot, cold, and associated with other bodies. The paper, after fixing in the ordinary way, has been subjected to different reagents, and again fixed, but in all cases this quarter grain of silver per sheet remains, and will not be displaced. Ammonia and carbonate of ammonia have been recommended as additions to the hypo bath, but. even with these, we find little if any diminution in the quantity of silver left behind. Treating the paper with hydrochloric acid and common salt after fixation, washing, and again fixing, seemed to give the best results; but whether this method could be applied in the case of photographs we are not prepared to say, the image might be too much affected by the hydrochloric acid to be of any value practically. Sulphocyanide of potassium is no better fixing agent than hypo. Chloride of ammonium leaves a very large quantity of silver in the paper. Chloride of magnesium, which has been recommended, also leaves much silver.

If each photographer would only make up his mind, and do a little work in the direction of eliminating the last trace of silver in the high lights of albumen prints, I have not the least doubt that we should soon have a perfect fixing agent for albumenised paper, and then the image, consisting only of silver and gold, when required, would stand the test of time much better than our silver prints of to-day do. We must, I fear, never hope to obtain images made up of two metals to stand as well as those built up of single metals. Silver prints toned with gold will never last as long as potassium images, but they will, if perfectly fixed, stand as long as any ordinary mortal will last, and, if we can achieve that, we shall have done much.

A. HADDON.

CONTROL IN DEVELOPMENT: A REPLY TO MR. WATKINS.

[Photographic Club.]

WHEN Mr. Watkins read his paper on *Timing Development* before the Club a few weeks since, I ventured to say that some of his statements, for instance, "that the photographer had no control in development except timing," and that "there is no advantage in modifying development to suit various subjects or exposures," were quite contrary to my own experience and that of others.

On a subsequent occasion I showed before the members some results of my own experiments which I thought were conclusive proofs of the enormous power of control which is obtained by modifying the developer, especially in cases of over-exposure. It was, however, objected by one or two of the members that in the pairs of negatives which I showed as illustrations the development had not been carried on sufficiently to give an equal amount of density in the higher tones, and it was suggested, I think by Mr. Sinclair, that if this had been done the negatives might possibly have been made identical in printing density and gradation; it was pointed out at the time by Mr. Mackie and myself that further development could only tend to still more accentuate the difference in the action of the two developers I used.

I now bring before your notice some further trials in which development has been continued as suggested, and you will see that the result is just what I anticipated.

Of the two negatives which I now show you, one has received in my actinometer an exposure of 180 seconds, the other was exposed under the same conditions for ten seconds; both plates were then cut in two and one half of each developed separately in a normal two-grain pyro and soda developer, without bromide. The other two halves were developed, also separately, in a very powerful and highly restrained developer containing eight grains of pyro, seventy grains of soda carbonate, and sixteen grains of potassium bromide to each fluid ounce. In the first-mentioned plate, which I have marked A, you will see that the half treated with the modified developer shows all the gradations throughout the scale in proper printing density, the exposure of 180 seconds being about correct for this developer. In the other half, with normal development, the scale of gradation is quite different; the lower half-tones are very much too dense in proportion to the higher tones, which are quite buried and show scarcely any gradation either in negative or print. This half was developed five minutes, the half-tones appearing in about ten seconds, while the first half took eleven minutes to develop, the half-tones appearing in about five minutes. I tried to develop both halves to give as nearly as possible the same printing density in the highest lights.

The other negative, marked B, which had ten seconds' exposure, shows the half developed with the normal developer in about correct printing gradation, the half-tones appeared in sixty seconds, and development was completed in four minutes.

The other half of this plate was developed with the strong developer for thirteen minutes, and then stopped because the highest tones were up to full printing density. You will notice that there is a very steep gradation in the higher tones, while the lower tones have been kept back and show scarcely any detail; the half-tones, such as are visible, appeared in about twelve minutes, or just before development was completed. This half of the plate has every appearance of very great under-exposure, although it was exposed the same time as the half which with normal developer comes out as fully exposed.

These simple tests are, I think, amply sufficient to show that:—

1. It is impossible to obtain, with normal development, correct printing gradation in a much over-exposed negative.

2. That by modifying development we have an enormous power of control even with widely different exposures.

3. That the scale of tones and the ratio of gradation in the densities of a negative can be altered at will to an almost unlimited extent.

I also find that the time of appearance of the half-tones bears no definite relation to the time required to complete development. The same plate may be over-exposed for one developer, correctly exposed for another, and

under-exposed for a third, and the time required for development, as also the ratio between that time and the appearance of the half-tones, will vary in each; in these trials the variation is as 1 to 60.

I feel that some apology is due to the members of the Club for trespassing upon their time and patience in order merely to bring forward proofs of the existence of a power with which most are quite familiar. Mr. Watkins seems, however, to have taken a great deal of pains in endeavouring to show that this power, which is in daily use by thousands of practical photographers, "exists only in their imagination."

At first sight it may perhaps appear that the new theory adopted by Mr. Watkins is supported by his experiments; but, if we look more closely into his methods of working, we shall see how easily one may be misled. In all the examples he has shown I have not seen a single instance which may fairly be taken as a crucial test. In the first place, his first sensitometer trials show only three gradations of density, and also, in the later trials which he has described, only three progressive standard gradations are mentioned, *i.e.*, from 256 to 1024. All the higher densities, such as would show as the lighter half-tones in the print, are entirely omitted; it is precisely in these higher densities that the power of control is shown to its greatest advantage. In the lower tones used as a test by Mr. Watkins, and which are more akin to under-exposure, although there would, doubtless, be the usual difference in the ratio of gradation with radically different developers, the differences in printing density would probably hardly be perceptible within the very limited range of Mr. Watkins's sensitometer, such an instrument to be a reliable test should at least give a range of densities from the blackest tones of a silver print to white paper, or from the unit of 256—below which Mr. Watkins tells us his "exposures failed to make a developable impression on the plate"—to not less than 131,072, instead of 1024; that is to say, ten standard tints instead of only three as used by Mr. Watkins. This greater range is well within the power of representation in ordinary silver printing.

I would also point out that, in the sensitometer tests as well as in the landscape trials he describes, Mr. Watkins has not made a sufficiently radical change in the character of his developers. All his so-called normal developers contain too much bromide and too little alkali—they are too highly restrained for comparison. A normal pyro and soda developer should contain no bromide, or only the merest trace, instead of equal weights of pyro and bromide with a minimum quantity of soda, as used by Mr. Watkins. In my own comparative trials I find it impossible, with the two widely-different developers I use, to produce identical results on two exactly similar plates unless one has had from twenty to forty times the exposure of the other. This is quite irrespective of time of development.

I need hardly mention that, in bringing this matter again before you, I have not the slightest antagonistic feeling towards Mr. Watkins, for whom I have the greatest esteem, but as a practical worker, and one of the oldest members of the Photographic Club, I desire, most emphatically to protest against the statement that "there is no control, other than timing, in development," and that "there is no advantage in modifying the developer to suit various subjects or exposures."

If these statements were true, the practice of photography would lose one of its greatest charms, and would be degraded to a mere mechanical operation.

As a further illustration of the practical utility of the power of modifying results by development, I have brought with me a number of prints from negatives taken in Egypt and Greece on very rapid films. I am informed that these negatives were all much over-exposed, but you will see that, by modifying the developer as I have described, a very perfect set of negatives has been the result.

I also show you a pair of landscape negatives made in 1887, both were exposed for the same time, sixty seconds—but developed differently—one is a good negative with plenty of contrast, but the other is so flat and grey that it would require a very great stretch of the imagination to suppose for a moment that it is capable of giving a good print.

B. J. Edwards.

IVES'S STEREOSCOPIC PHOTO-CHROMOSCOPE.

[Philadelphia Public Ledger.]

At the Franklin Institute, on November 23, Mr. Frederic Ives lectured on *The Photo-chromoscope*. The photo-chromoscopes shown at his former demonstrations have been "single," but he now shows a stereoscopic instrument in which the solidity of the image, combined with the marvellous rendering of the natural colours, produces an illusion of reality which is absolutely startling. Owing to the fact that his patents for some recent improvements have not yet been issued, the back of the instrument was boxed in against the source of light, and some went so far as to suggest that the object seen was actually present, concealed in this box.

In connexion with the subject of stereoscopic photo-chromoscopes, Mr. Ives said: "Of course, any photo-chromoscope can readily be made stereoscopic by duplicating some of its parts, just as an ordinary camera is made stereoscopic by using two objectives instead of one; but Nachet, of Paris, claims to have recently accomplished the result in a simpler manner, by viewing the images of the red and green sensations with one eye, and that of the blue-violet sensation with the other. Such an instrument, however, can be neither a true photo-chromoscope nor a true stereoscope. It is defective as a stereoscope because the same colours are not seen by both eyes, which tires the nerves of vision, and because some strongly coloured objects will be distinctly represented only to one eye, and therefore without stereoscopic relief. It is even more defective as a photo-chromoscope because colours cannot be perfectly blended except upon the same retina, the impression otherwise being a changeable one, as the attention is involuntarily drawn from the sensation in one eye to that in the other in rapid succession. This curious effect can be seen by placing deep ruby-red glass in front of one eye, and a deep green in front of the other, and, looking at a white object; if Nachet's idea was correct, the object should appear bright yellow; but, in fact, the colour is not only changeable and the impression irritating to the eyes, but it is never at any moment a good yellow. With yellow and blue glasses, corresponding to the mixtures in Nachet's instrument, the defect is less marked and irritating, but it is of the same character. In my own instrument each eye sees an image complete as to colour-rendering, and it is only necessary to place a yellow glass over one eyepiece and a blue glass over the other, practically converting it into a Nachet instrument, in order to make the result intolerable by comparison. In view of these demonstrable facts, it is reasonable to think that accounts of Nachet's device which have appeared in print would not have been written by anybody who had ever seen the image in a true photo-chromoscope. In fact, Leon Vidal, the writer, has confessed that the Nachet pictures are not equal in quality to the Lippmann productions, which have in no instance reproduced all of the natural colours as perfectly as you will see them in the photo-chromoscope to-night."

The latter portion of Mr. Ives's lecture was devoted to the production of permanent colour prints from photo-chromoscope negatives, and a magnificent series of such prints in the form of lantern slides was projected upon the lantern screen. Besides many familiar still-life subjects, the colours of which were well known to the people present, there were views of scenery in Switzerland, Italy, and the Yellowstone Park. The first use of such photographic natural-colour lantern slides for popular lecture illustrations this winter, Mr. Ives said, will undoubtedly mark the commencement of a new era in lantern-lecture work.

ALPINE CLUB EXHIBITION.

At the Nineteenth Century Art Gallery, 9, Conduit-street, Hanover-square, W., the Alpine Club have on view a collection of mountain paintings and photographs. The latter are placed in a separate room, and form a capital little exhibition of themselves. In a "preliminary note" to the catalogue, the President of the Club (Mr. Douglas Freshfield) has the following references to photography as a means of depicting Alpine and mountain scenery:—"Of late years photography has claimed an increasing share of attention at these our winter exhibitions. The Club has been fortunate in reckoning among its members photographers of the highest technical skill, and of singular audacity and energy as climbers. They have depicted the highest crests of the Alps and the Caucasus with a thoroughness hardly equalled in far more accessible regions. More than one of them has shown how artistic sense and intimate knowledge of the mountains may be brought into play in an art some might deem mechanical. Mr. W. F. Donkin often selected his standpoint, and limited his picture with the utmost skill. Signor Vittorio Sella chose the moment of the day for his great panorama from Elbruz. Captain Abney's vision of Mont Blanc by moonlight is a masterpiece. M. Loppé, when he exchanges the brush for the camera, surprises us by turning into an impressionist, by giving us less form than atmosphere. It used to be a commonplace with certain persons that, on the great peaks, nothing was to be seen; that, as a writer once unhappily put it, "Altitude is not Pulchritude." The man who could maintain such a paradox in the face of the revelations of our photographers would prove himself blind.

"In one point, however, we must admit that the new art is often open to criticism. Mountaineers are sometimes charged with making the most of their gymnastic feats. Those I have known have been, for the most part, modest and precise, not to say prosaic persons—at any rate, in their writings; but I cannot claim as much for their cameras. These little instruments are given to sensationalism of the crudest kind. They make the easiest rocks look highly dangerous, and difficult cliffs impossible. Let wives and mothers take heart—mountaineering is not nearly so bad as it is photographed."

The collection of over 200 photographs, is a good and varied one, and not, as might at first be supposed, simply confined to Alpine views. Captain Abney shows his excellent *Mont Blanc by Moonlight—Winter*, an enlargement from a $7\frac{1}{2} \times 5$ negative, which received thirty-five minutes' exposure; also his *Snow, Hoar Frost, and Ice at Chamonix*, a pretty study aside of its intrinsic merit. Signor Sella is largely represented by many of his admirable glacier views in the Alps and the Caucasus. *Kulu Mountain Scenery—Himalayas*, affords Mr. St. George Gore an opportunity of depicting views in the Himalayan range. Mr. W. Lamond Howie illustrates some of the ridges of Ben Nevis. Mr. Spooner, Mr. Dent, and others lend some of the large Alpine studies made by the late Mr. Donkin.

In addition to some of her beautiful Alpine snow scenes with which visitors to photographic exhibitions are familiar, Mrs. Main sends a series of hand-camera studies, illustrating *Climbing in the Engadine*. Mrs. Lewis has some good *Views in the Dolomites*. The work of Messrs. Trousdale (Zermatt views), Garwood, and others will attract attention.

Aside of the generally excellent photographic qualities of the exhibits, much interest will, doubtless, be taken in them by mountain travellers, explorers, tourists, &c. In the large room are numerous beautiful paintings, by eminent artists, of Alpine and similar subjects.

CLOUDS.

Written for the ALMANAC, but received too late.]

In photography, equally as in painting or any other graphic art, a suitable and effective sky is frequently the making of the picture. Many landscapes, or specially marine views, are converted from being commonplace and uninteresting into pictorial successes by the addition of striking and harmonious clouds, while a picture that is good in itself is incomplete until they are added, if absent from the original negative.

A guiding principle in adding a sky is that it forms part of an existing picture, of which it is in fact the extreme distance, and the harmony of the composition as a whole must overrule every other consideration. As the general impression of atmospheric effect is conveyed by the more distant rather than the nearer objects, these will in most instances determine the depth to which the sky must be printed; as a general rule, its predominating tone must be lighter than that of the distance, though, where there is any considerable expanse of sky, the upper part may occasionally be darker, provided that it is lighter as it approaches the horizon.

It is frequently contended, as an absolute rule, that, when clouds are printed from a separate negative, all the data relating to the two must be in perfect agreement. Focus of lens used in each case, direction of light and wind, and time of day must all be the same. From this view the writer very strongly differs. In many cases clouds may be secured on the same plate with a landscape, or be taken separately under identical conditions, and yet appear less harmonious than others printed from a negative in which all the conditions are at variance. In pictorial work the appearance of truth is far more important than the rendering of actual facts, and this applies equally to the legitimacy of adding clouds to a landscape photographed on a cloudless day; if neither the trained artist nor the close observer of nature can see anything discordant in the completed work, the correctness of the method should not be questioned.

A good reason can be urged in favour of taking cloud negatives with a lens of shorter focus than that used for most landscapes. In fine settled weather, that generally chosen for out-door photography, any clouds that there may be are high, and consequently might be taken with a lens including an angle of about 40° to 45°; but the most favourable opportunities for obtaining cloud negatives are in unsettled, showery, and changeable weather, when the clouds are so low that, if the same lens were used, the individual masses would appear so large that they would be out of all proportion for any ordinary landscape, and the negative almost useless.

Their size, too, would make them appear far too near, instead of giving the effect of the greatest possible distance. Most of the writer's landscapes and marine negatives have been taken with lenses embracing angles of 33° and 41°, that is 14½ in. and 11½ in. focus, for plates 8½ × 6½; while nearly all his sky negatives include 55°, or 8¼ lens for the same plate.

The most useful clouds are those ranging from opposite the sun to right angles to it. Those nearer, and especially the very near, are valuable for special, bold, and striking effects, but must be used with the greatest caution.

In obtaining cloud negatives under any conditions, isochromatic plates give immense advantages, with or without a pale yellow screen according to circumstances. Even the most delicate light cirrus clouds, in a clear blue sky, are easily secured without any modification of the normal developer. For Edwards's medium isochromatic plates, with a pale yellow screen, exposures will vary from three seconds with *f*-64 for a bright sky in spring, to as much longer as the conditions, and light, and character of negative desired may require.

Excepting for bold and striking effects, negatives should be thin and full of gradation; a full exposure will secure this result.

HENRY W. BENNETT.

RECOVERING GOLD FROM TONING SOLUTIONS.

[Written for the ALMANAC, but received too late.]

It is well known to chemists that gold is precipitated in the metallic state from solution if sulphurous acid be passed into the same for a short time. It occurred to me that we might take advantage of this fact in order to recover any gold that might be left in a toning solution which had done the work it was called upon to do, but which work had not thoroughly removed all the previous metal.

The favourite toning solution for gelatino-chloride paper is, undoubtedly, the sulphocyanide, and my remarks apply specially to that toning bath. If it be kept after it has been used, especially if made alkaline or neutral by the addition of a small quantity of carbonate of soda, it usually turns reddish, due to the precipitation of gold in a finely divided state, and in this condition I have seldom found it work satisfactorily; a fresh bath therefore is the best way of enabling any one always to produce the same and satisfactory tones.

When the bath is done with, add to it a small quantity of sulphite of soda, and then any strong acid such as hydrochloric or sulphuric (not nitric) till the solution smells strongly of sulphurous acid. In this condition leave the solution for 24 or 48 hours (it is best to close the bottle with a cork or stopper to prevent the escape of the gas), at the end of this time a brownish deposit will be found at the bottom of the bottle which is metallic gold. Old toning baths can be saved in Winchester quarts and, when a sufficient quantity of solution has accumulated, it can be treated as above. The supernatant liquid can be poured off and the gold collected from the different bottles on a filter paper in a funnel. The precipitated gold can then be dealt with as desired *i.e.*, either converted into chloride for use or sent to the refiner with the other residues.

A. HADDON.

STEREOSCOPIC BITS.

[Written for the ALMANAC, but received too late.]

Flowers, crystals, and many small curios form excellent subjects for stereoscopic work; care should, however, be taken in photographing them that the lenses are not too widely separated; a single-lens camera is the best for this purpose, as, when photographing any near object, as a small fossil, a separation of one inch is quite sufficient to give a proper idea of relief.

Paper stereoscopic slides can be conveniently mounted in optical contact with a clear white glass of the standard size, in the style generally known as "opaline." This to a great extent obviates the granularity usually visible on paper slides.

If some obliging manufacturer would furnish us with matt-surfaced celluloid coated with a good printing-out emulsion, it would greatly facilitate the production of transparent stereoscopic slides. The celluloid could easily be cut for transposition of the pictures, while a stout cut-out mount would at the same time ensure flatness and protect the surface of the film from abrasion.

A couple of stout mounts with cut-out apertures of the correct size, bound together at the ends with stout paper or tape, affords a handy means of adjusting paper prints before trimming and mounting. After the best position for the prints has been found by placing them between the cards and sliding them slightly from one side to the other, a blunt tracing point may be run round the opening, and the print afterwards trimmed to the line so made.

Many people have never been able to see a picture properly in the stereoscope. This is usually due to a great disparity in the two eyes. If an ordinary single unrimmed eyeglass of suitable focus is placed over one of the eyepieces, it will generally be found that the pictures will be seen to unite perfect and give the desired effect of solidity.

EDGAR CLIFTON.

A BIG YELLOW BOOK.

[Written for the ALMANAC, but received too late.]

Three days out from Bombay, homeward bound, I am comfortably dozing off after luncheon, stretched at full length in my bamboo chair on the hurricane deck of a *particularly* comfortable P. and O. liner, when something falling on the deck disturbs me; I discover that a fellow voyager, three chairs away, has succumbed to the influence of Morpheus and dropped the book he was reading, which book is no other than that wonderful package of literature, THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. I make up my mind at once to be very friendly with that sleeper for the next few days, for had I not seen the volume on sale at Bombay before leaving, and strongly coveted it? but I had to conquer my covetousness, for my portmanteau absolutely refused to receive another toothpick, let alone a bulky brick like the aforesaid "yellow book."

But, alas! I am doomed to despair, for, on begging the loan of the book two days after, I am plaintively told by its owner that it took up so much room in his valise that he was obliged to put it away in one of his chests in the hold!

In the course of my travels during the last few years I have discovered that its popularity amongst photographers is pretty well world-wide, for I have come across it in icy Montreal, and in friend Burton's library in sunny Tokio, in dealers' stores in sweltering Calcutta, and in dusty, windswept San Francisco, in imperial Rome and queenly Melbourne; I have seen it on a shelf in a photographic gallery in that city of great altitude, Denver, as well as at charming, hospitable Hong Kong, at beautiful, balmly Honolulu, and even at that paradise for photographers, Grand Cairo. I have seen its lordly bulk highly cherished in the sedate hub of the universe, Boston, as well as at tropical steamy Singapore, and though, dear editors, as a common or garden globe trotter, I plead guilty to having refused, when travelling, to add such a bulky package to my already bursting baggage, may I as a photographer (who reads it all religiously through every year, advertisements and all) beseech you not to allow it to get the thousandth part of an inch thinner, but let it get bigger and bigger, for "may its shadow never be less."

R. P. DRAGE.

ARRANGEMENT FOR PLATE-BACKING TO PREVENT HALATION IN LANDSCAPE WORK.

[Written for the ALMANAC, but received too late.]

I HAVE often noticed plates put forward as securing perfect freedom from halation. Whether there may be any that attain this desirable end, I am not prepared to say. In my landscape work I have generally preferred to give rather full exposures, and have found in a very varied series of plates halation almost constantly present wherever circumstances were at all favourable to it. Last year (1893) I constantly backed my plates, both English and Continental, with paper sold for the purpose by an English firm. Theoretically, I had my doubts as to whether it would prove effective because of its smooth surface and orange colour, many of my plates being orthochromatic, and during the summer of 1893, in Germany, made a considerable series of trials with very varied landscapes. My greatest trouble throughout was from the halation. If I make a further analysis of these negatives, I may be able to satisfy myself as to which plates are most free from it; but I think, where circumstances are at all favourable to it, the safest thing is to back the plates, and this year I have done so with one of the non-actinic mixtures recommended, which dries quickly, and can easily be removed with a wet sponge, and so far I have had no further trouble. I come now to the main purpose of this little article.

When I resolved that my plates must be backed, the question arose for me how to do it in the simplest and easiest manner, and how, at the same time, to avoid any dust that might arise from abrasion of the backing in plate boxes, &c. With paper backing, I should have had no fear of this latter. I pointed out to the maker or vendor of that which I used that the smooth surface would be calculated to reflect a certain amount of light, and this light, being of an orange colour, might prove detrimental with orthochromatic plates. I suggested that he should provide a paper with matt surface, and of a colour that would absorb all actinic light. I do not know if he has taken the hint; I noticed that he looked upon me as rather a novice.

To secure dispatch in applying the other kind of backing and absence of dust from its abrasion, I make the following arrangement. Let me premise only that for outdoor work I have nearly always used Mr. George Hare's patent plate boxes, which, as the smaller sixes take each eighteen plates and the larger one dozen, I find a great convenience. I was much afraid, if the backing were not kept carefully from the edges, the friction of these latter, sliding in and from the grooves, might produce dust, so I proceed as follows. I will suppose the size to be half-plate:—

Take two pieces of cardboard, one, a_1, quite thin; the other, b_1, nearly the thickness of the plates, and of such a size that, when six pieces slightly larger than the plates have been cut out of each, a margin of about an inch may be left round the edges and between the plates. It will easily be seen that, if the plates ($6\frac{1}{2} \times 4\frac{3}{4}$) be arranged along the boards in two rows of three each, and so that their lengths lie across the board, the measurements of the boards must be $4\frac{3}{4} \times 3 + 4 = 14\frac{1}{4} + 4 = 18\frac{1}{4}$ inches long and $6\frac{1}{2} \times 2 + 3 = 13 + 3 = 16$ inches broad. On a_1, the thinnest board, mark out, by means of measure divided into inches, &c., with flat ruler and pencil, in two parallel rows of three each, places for the six plates, and cut out the six pieces of cardboard so that the six plates will just fit nicely into their places. This may be done very nicely by means of a strong knife, with edge well sharpened right up the point, such as a shoemaker's knife, a flat wooden straight-edge, not too thin, and a board, like a drawing-board. The cardboard laid on this latter, the straight-edge adjusted to one of the pencil lines and held firmly down with the left hand, while the knife, the blade moving against the straight-edge, is drawn along with the right hand as many times as are necessary to make a clean cut through. Generally, with thin cardboard, one cut will be sufficient; but it must be so placed that the cut comes across the grain of the drawing-board. Mark on one corner of this cut-out piece a_1, and on one corner of the other b_1. Lay these together so that the two boards exactly fit. Now run round the pencil, so as to mark the places for the plates on b_1, and cut out the rectangular pieces, as in a_1. By bringing the corners a_1 and b_1 together inside, the holes will always coincide. Now take two other pieces of the same size and mark a_2 and b_2. The former should be rather stout, the latter may be less so. Take a_1, a_2, wet the front sides with a damp sponge, and apply strong gum or glue, or whatever you are accustomed to use, to the backs (I generally use gum), bring them together and rub down with something hard and smooth, so as to bring the gummed surfaces into close contact, and put between paper under pressure to dry. Proceed in the same manner with b_1 and b_2. Now, on the two inner corners, instead of the pencil marks a_1, b_1, put in ink a large A_1 and B. Take the latter, and in the hollows left for the plates, mark round with pencil lines, at one-eighth or three-sixteenth of an inch from the edge. That will give rectangles $6 \times 4\frac{1}{4}$ inches, or rather less; cut out these pieces as before. Our backing frames are now ready for use. I generally colour them myself with some non-actinic colour, and, when thoroughly dry, varnish them.

TO USE THE FRAMES.

Having got everything ready, the lantern on a table, giving a non-actinic light just sufficient to enable you to see what you are about and not enough to be dangerous for the plates, the A_1 frame, face up, in front of the lantern, lay six plates face down in the hollows. On these place the frame B face down, and the corner B on the corner A_1. It ought to fit so as just to take the upper parts of the plates into the hollows on its under side and to let the backs of the plates appear through the holes at the upper side, all except the one-eighth or three-sixteenth-inch margin all round. It is from this margin that we wish to keep the backing medium. With a sufficiently stiff brush spread it evenly over the other part (not too thickly), bringing it quite up to the pasteboard margin all round. Now remove the B frame and you see your plates nicely backed with a beautifully clean margin, so that there need be no abrasion producing dust from the edges of the slides, grooves of plate, or changing boxes, &c.

If it is desired to back a dozen, or larger numbers of plates rapidly at one time, one or two extra frames A_2, A_3, &c., may be provided. Then, A_1 being removed with the backed plates upon it, another half-dozen on A_2 may be proceeded with and then removed, giving place to A_3. By this time, probably sooner, the backings of the first set will be quite dry, and the plates may be removed to boxes or slides, setting A_1 free for further use. This process may, of course, be continued indefinitely. I am writing this in case it should be useful to any others wishing to work under similar conditions.

W. WASHAM.

ETHNOGRAPHIC PHOTOGRAPHY.

[Written for the ALMANAC, but received too late.]

MAY I offer the following suggestions to the large army of excellent amateur photographers who are scattered over the world, and who are in a position to use their art (the most perfect and accurate recording process known) in the interests of science and for the benefit of posterity. Very many good amateur photographers are also Government officials, or other professional men and women, who are so situated as to have unique advantages for observing the peculiarities of savage races, the manners and customs of little-known or intentionally secluded people, and their methods of work, &c.

There is no necessity for a big scheme of work being undertaken. Most amateurs who have brains and energy enough to be good photographers have also other accomplishments, and I offer the following as illustrations of the work which might be done:—

Burmese Musical Instruments.—The patala, or bamboo harmonicon, supposed to be one of the oldest instruments, and to contain the original scale of Burmese music, might be taken. A photograph should be taken of the rough wood and bamboo; three or four photographs should be taken of the workman shaping the wood, &c., showing his method of holding it and working it with his tools, and the parts of the instrument gradually approaching completion; a photograph of the finished instrument; photographs of the way in which the instrument is tuned and also played. Accompanying each photograph should be a carefully written description of it, noting any peculiarities in the method of work, what woods, tools, varnishes, &c., are used, the musical notation, &c.

The agriculture of semi-savage tribes, showing in a similar way, by photography, the methods of manufacture of their implements, &c. The manufacture of the pottery of savage races, costumes, tattooing.

The photographs should not be smaller than whole-plate, the prints should be in platinotype, mounted in albums, with the printed descriptive letterpress pasted underneath, and the albums when filled should be sent to Sir A. W. Franks, K.C.B., F.R.S., the British Museum, London, W.C.

Three plates per week would in a year or two result in a very valuable monograph on any subject, and now is the time to undertake the work. Before an advancing civilisation the savage races, and their arts and trade secrets, their peculiar customs, &c., are fast changing or vanishing, and, as in the case of the extinct Tasmanians, scientific facts are left unrecorded and lost for ever, for want of public-spirited and educated people to collect and record them.

Now, the amateur photographer must, from the amount of plates he wastes, be public-spirited, and those of the class I mention are always educated, so they are evidently indicated as the photographic recorders of the present and future, for science.

A copy of *Notes and Queries on Anthropology*, published by the Anthropological Institute, 3 Hanover-square, London, W., will assist any inquirer who is puzzled as to his subject.

M. V. PORTMAN.

Our Editorial Table.

THE ILFORD YEAR-BOOK FOR 1895.

Ilford: The Britannia Works Company.

THIS nicely printed and bound little Year-book takes the form of a convenient diary, being prefaced by a concise guide to photographic practice, condensed from Mr. Bothamley's *Ilford Manual*. At the end of the book are spaces for recording 396 exposures. The frontispiece is a pretty little picture of a *Thrush's Nest*, the negative being taken on an Ilford plate. Perhaps the most commendatory thing we can say of the *Ilford Year-book* is that our copy is already in use for noting future engagements, and that it is likely to enjoy a twelve months' tenancy of the editorial pocket.



Photo by MESSRS. G. WEST & SON,] "VIGILANT" WINNING THE CUP. [SOUTHSEA. *Copyright.*

Marion's "120" Instantaneous

SPEED DETERMINATION IN H. & D.'s UNITS.

"Just to Hand."

Splendid Batches from Factory. Send for a Sample of a Batch.

"Palmerston Road, Southsea.
"*August 8th*, 1894.

"You will be pleased to know that we have obtained some very good photos of the yachts last Saturday, although the day was dull, and when taking the photos of *Vigilant* winning the Cup it was very dull and rainy, yet owing to the MARVELLOUS RAPIDITY and QUALITY of your plates we obtained a splendid picture.

"G. WEST & SON."

"Just to Hand."

Splendid Batches from Factory. Send for a Sample of a Batch.

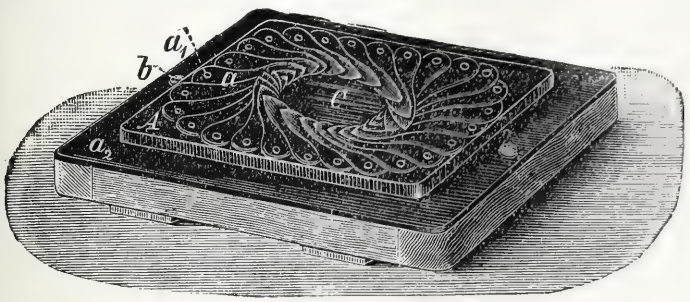
The above will speak for the Wonderful Rapidity of our "120" Instantaneous.

MARION & CO., 22 & 23 Soho Square, LONDON, W.

Krudnik's "Iris" Vignetting Mask.

C. A. Rudcwsky, 3, Guildhall Chambers, E.C.

The principle employed in this vignetting mask is that of the "Iris," which allows of the vignetting being adapted to various shapes. As



will be seen from the cut, the leaves turn on pivots, and can be arranged to give any size or form of vignette. The leaves will not move by themselves. This is an excellent and convenient form of vignetter, which should be appreciated by professionals and others.

News and Notes.

Mr. E. A. Leblanc is at present in Belgium demonstrating Dr. Andresen's developers.

The Christmas Holidays.—Messrs. Wratten & Wainwright, of 38, Great Queen-street, W.C., inform us that their warehouse and office will be closed at 2 p.m., on Saturday, December 22, for the Christmas holidays, and re-opened at 9 a.m. on Thursday, December 27.

Croydon Art Society.—The annual Exhibition of the above Society was held on Monday, the 10th inst., at the Public Hall, Croydon. In the class for "the Most Artistic Photograph," the prize was awarded to Mr. Charles Moss, for *A Winter Sunset*, prints by Mr. E. A. Carry and Miss Lamotte being commended. The Judge was Mr. H. Maclean.

Mr. F. N. Parsons, of the Library, Budleigh Salterton, sends us a photographic Christmas card. The photographs are a group of Budleigh Salterton and neighbourhood, including Hayes Farm, the Birthplace of Sir Walter Raleigh, and the Raleigh Arms, on a pew end in the parish church. The card is a folding one, and makes an effective photographic Christmas card for local use.

Royal Institution.—A general monthly meeting of the members of the Royal Institution was held on the 3rd inst., Sir James Crichton-Browne presiding. The following gentlemen were elected members:—The Rev. J. O. Bevan, Messrs. H. T. Brown, F.R.S., H. S. Keating, G. Lindo, S. Morse, E. Steinkopff, G. J. Stoney, F.R.S., C. L. Tuckey, M.D., A. E. Western, C. Wightman, and G. W. Wolff, M.P. The special thanks of the members were returned to Mr. Ludwig Mond and Dr. William S. Playfair for donations towards the fund for the Promotion of Experimental Research at Low Temperatures. The following lecture arrangements were announced:—Professor J. A. Fleming, F.R.S., six lectures (adapted to a juvenile auditory) on *The Work of an Electric Current;* Professor Charles Stewart, twelve lectures on *The Internal Framework of Plants and Animals;* Mr. William Samuel Lilly, four lectures on *The English Humourists of the Nineteeth Century;* Mr. L. Fletcher, F.R.S., three lectures on *Meteorites;* Dr. Samuel Rawson Gardiner, three lectures on *Three Periods of Seventeenth-century History.* 1. The Monarchy. 2. The Commonwealth. 3. The Restoration; Dr. E. B. Tylor, F.R.S., two lectures on *Animism;* Mr. Lewis F. Day, three lectures on *Stained-glass Windows and Painted Glass from the point of view of Art and Craftmanship;* Dr. A. C. Mackenzie, three lectures on *Music* (with musical illustrations); the Right Hon. Lord Rayleigh, six lectures. The Friday evening meetings will commence on January 18, when Professor Dewar will deliver a discourse on *Phosphorescence and Photographic Action at the Temperature of Boiling Liquid Air.* Succeeding discourses will probably be given by Sir Colin Scott-Moncrieff, Mr. Henry Irving, Dr. G. Sims Woodhead, Mr. Clinton T. Dent, Professor A. Schuster, Professor A. W. Rücker, Professor Roberts-Austen, Professor H. E. Armstrong, the Right Hon. Lord Rayleigh, Mr. Clinton Dent, and other gentlemen.

"Photo Notes."—Respecting this projected new publication, which is intended to be a fortnightly magazine for members of photographic societies only, Mr. C. Welborne Piper, of 46, Shooters's-hill-road, Blackheath, writes: "I enclose for your perusal a copy of a circular which I have just issued to the various photographic societies. The details, of course, may be subjected to slight modification, but the general idea of the scheme is pretty fully explained. It is put forward in the hope that it may assist in infusing new life and interest into the work of the societies, and also assist those responsible for their management in some of their most irksome duties, besides which, I believe, from past experience as an Hon. Secretaty that in most societies the adoption of the *Notes* will also have the effect of reducing their annual expenditure. *Photo Notes* is not intended to rival in any way the present journals, and it will be conducted on altogether different lines. It is proposed in each issue to devote a space to contemporary publications, drawing special attention to any important or interesting articles, &c., that may have been published during the previous fortnight, by mentioning the number in which, and the page on which, they are to be found." The following outline may give some idea of how *Photo Notes* is to be conducted:—To issue a fortnightly journal to all such clubs as may agree to arrange for its distribution among their members, and to pay a *merely nominal* annual subscription. The necessary number of copies to be sent post free every fortnight to the secretary of each society. The magazine not to be sold publicly or have any circulation outside the subscribing societies, excepting the usual complimentary copies sent to the photographic press and to advertisers. The outside cover of each magazine to contain a list of the meetings of all the subscribing societies for the following fortnight, this list serving as an announcement to each individual member of the next meeting of his own society, thus saving the cost to the club of printing the usual notices.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 23,387.—"Improvements relating to Photographic Printing Frames." Complete specification. H. J. Spratt, A. S. Spratt, and G. A. Spratt.—*Dated December*, 1894.

No. 23,587.—"Improvements in Photographic Cameras." The Hon. S. M. T. Amherst.—*Dated December*, 1894.

No. 23,648.—"nmprovements in or relating to Photographic Cameras.' J. Pearse.—*Dated December*, 1894.

No. 23.663.—"A Folding or Rolling Scale for Showing on Phctographs Actual Measurements of Buildings, Bridges Machinery, and other solid objects where measurements are required." J. W Addy.—*Dated December*, 1894.

PATENTS COMPLETED.

Improvements in or connected with Photographic Shutters.

No. 16,844. Walter Oehmke, 35, Dorotheenstrasse, Berlin, and Carl Paul Goerz, 140, Haupstrasse, Schöneberg, near Berlin, Germany.—*October* 27, 1894.

Our invention relates to a photographic instantaneous blind shutter, in which the slit in the blind is capable of being narrowed or widened by means of a knob placed outside the apparatus, according as it is desired to give a longer or a shorter exposure.

The blind is made in two portions stretched upon rollers, and, when the shutter is being set, the blind is wound on to one of the rollers, and at the same time a spring, situated in the other roller, is placed in tension. The exposure is effected by releasing a catch lever, when the blind is drawn by the spring on to the roller.

The two portions of the blind are connected together by cords, which are wound upon drums mounted loose upon the spindle of the spring roller, and having fixed thereto toothed wheels, which engage with pinions situated on a spindle. A spiral spring passes against one of the drums, and constantly tends to force this drum towards the roller, so as to cause a pin upon the roller to engage in a hole in a toothed wheel, and thereby couple the drum with the roller, so that, the drums being connected by the said gearing and spindle, they are compelled to partake of the movements of the spring roller.

To adjust the width of the slit in the shutter, the lower drum must be released from engagement with the spring roller. For this purpose the spindle, which is furnished with a knob, is adapted to be moved vertically or in the direction of its length, and carries a collar, which then bears upon the toothed wheel of the lower drum, so that, when the spindle is shifted, the drum is moved out of engagement with the pin of the spring roller. The drums can now be turned in either direction, as desired, by means of the knob upon the spindle. If they be turned in the direction to cause the cords to wind off the drums, the spring in the roller will draw a portion of the blind back to a corresponding extent, so that the slit will be widened. If, on the other hand, the drums be turned in the direction to cause the cords to wind on to the drums, the other portion of the blind will approach the first-named portion, the slit being thus narrowed.

In order to indicate the width of the slit upon the exterior of the apparatus a toothed wheel is placed upon the spindle, and this wheel is brought, by the longitudinal shifting of the spindle, into engagement with a toothed wheel, upon which is a fixed pointer, which indicates the width of the slit.

Improvements in Producing Photographic Prints.

No. 24,963. James Packham, 16, Katharine-street, Croydon Surrey. *October* 27, 1894.

My invention relates to the production of warm or pleasantly tinted photographic prints that have been previously produced by the ordinary process of photographic printing by the action of light on the salts of platinum, or platinum salts in combination with other metallic salts.

According to my invention I produce varying coloured tones upon the ground-work of prints, as above described, by a permanent deposition of vegetable tinctorial matter, such deposition being brought about by the action of a solution of vegetable dye-stuffs which may or may not be heated.

Several tinctorial agents may be employed to produce the deposition described above, but those which I prefer to employ, when sepia or brown tints are desired, consist of tannin, cutch, or catechu, or their products, or derivatives, or a combination of these organic matters with other vegetable dye materials as, for instauce, barks of various kinds, sumac or madder, either alone or in combination with deoxidising agents.

In carrying out this process care must be taken that any examination, and changing and handling of the paper and prints is carried out in absolutely non-actinic light, so as to retain the high lights in their greatest purity.

The developer used for platinum prints materially affects the resultant tint produced by my process; varying results may therefore be obtained by employing a neutral acid or an alkaline developer, or a developer in combination with organic matters, as, for instance, sugar or glucose.

The platinum printing paper may be allowed to become what is known as stale, *i.e.*, it may be allowed to be freely acted upon by the atmosphere, either before or after printing, with advantage to the resulting tints where varying results are desired; such exposure may vary from hours to days, but in all cases the paper must be carefully shielded from the action of light. Other variations in the process of development of the platinum paper will also produce varying results at the will of the operator, such as by using a very dilute or strong developer, and employing it at varying temperatures.

To produce the deposition of the tinting substance by what I will call the hot process, I proceed as follows:—I lay the print, previously soaked in distilled water, in a porcelain developing dish having a perforated false bottom, or tray, which serves to prevent the print from falling to the bottom of the dish. I next take a porcelain dish containing, say, twenty fluid ounces of pure water (distilled) at a temperature of 120° to 130° Fahrenheit, and dissolve therein from ten to thirty grains of the tinctorial matter which I intend to employ, say, cutch or terra japonica, an extract of uncaria gambir, which has been previously reduced to a fine powder, stirring with a clean glass rod till dissolved. This solution is now poured over the print in the developing dish, the latter being slightly rocked to keep the fluid in motion, and the temperature of the solution maintained at from 115° to 130° Fahrenheit, until such time as the desired depth of tone is obtained. The print is then well washed with plain water for two or three minutes, pressed between porous paper, and hung up to dry.

Varying results are obtained by keeping the tinctorial bath neutral or very slightly alkaline; if alkaline, the tint obtained will be warmer in proportion to the quantity employed at the expense of the high lights. It is sometimes desirable to employ one or two grains of oxalate of potass or sulphate of alumina to each pint of water when deep well water or water containing lime is employed.

Small proportions of other tinctorial matters may with advantage be introduced producing varying results.

In carrying out what I will call the cold process, I first prepare a strong decoction or infusion of the tinctorial matter to be used as, for instance, cutch or catechu, by boiling, say, 150 grains of the tinctorial substance, in 5 or 6 ounces of water until dissolved; from 20 to 60 minims of this strong preparation is then added to one pint of water, and the print to be toned is immersed in this liquid until the desired tint is secured, which will be in from 3 to 4 or more hours.

Some papers or prints during the above processes may become somewhat degraded in the whites; this may be rectified by treatment in a soap bath containing 100 to 150 grains of pure soap to each 40 ounces of water, and heated to a temperature of from 200° to 212° Fahrenheit.

The high lights are sometimes brightened by submitting the prints to the action of acid, preferably acetic acid, in a very dilute form, say, 30 to 60 minims to the pint.

When quite dry, if the prints require brightening, I sometimes treat them in a bath of very dilute spirit varnish.

What I claim is:—1. The production of varying tones upon photographic prints obtained by the action of light upon the salts of platinum, or platinum salts in combination with other metallic salts by the permanent deposition upon such prints of vegetable tinctorial matter, substantially as described. 2. In the production of photographic prints obtained by the action of light upon the salts of platinum or platinum salts in combination with other metallic salts, the use of vegetable tinctorial substances such as cutch, catechu, terra japonica or the like, substantially in the manner described. 3. Toning photographic prints substantially in the manner hereinbefore described. 4. Photographic prints toned substantially in the manner hereinbefore described.

Improvements relating to the Development of Photographic Pictures.

No. 25,002. Momme Andresen, 44, Melchoirstrasse, Berlin, Germany. *October* 27, 1894.

The invention relates to improvements in the development of photographic pictures by means of naphthaline derivatives.

In the Specification No. 5207 of 1889 is described a process for developing photographic images. At the date of that patent certain substances, belonging or related to the groups of naphthaline derivatives referred to in the said specification, were not known.

The present invention relates to the application for developing of the following substances which I have found useful developers:—

1. α-amido-β_1 naphthol-monosulpho acid, more correctly named α_1-amido-β_1 naphthol-α^2 monosulpho acid (*Journ. pr. Chem. N. F. B.* 44 S 521 ff.)

2. α-amido-β naphthol disulpho acid, more correctly named α_1-amido-β_1 naphthol-α_2 β_3 disulpho acid, prepared by the reaction of sulphurous acid on the nitroso compound of the β naphthol-monosulpho acid, Schaeffer.

The acid is obtained in the shape of fine, white, crystalline needles, easily soluble in water, insoluble in alcohol, and sparingly soluble in concentrated hydrochloric acid.

The alkali salts are very soluble in water, their solution turns brown after exposure for some time in the open air.

The acid solution turns yellow on addition of ferrichloride.

3. α_1-amidoβ-$_1$ naphthol disulpho acid, more correctly named α_1-amido-β_1 naphthol-α_2 β_4 disulpho acid, prepared by the reaction of sulphurous acid on the nitroso compound of the β_1-naphthol-$\beta_4$monosulpho acid.

The acid crystallises in the shape of fine white needles, easily soluble in water, insoluble in alcohol, and very sparingly soluble in acid solution. The alkali salts are very soluble in water, and their solutions become yellow brown in the open air. The acid solution turns yellow on addition of ferrichloride.

4. α_1-amido-β_1-naphthol-carbo-sulpho acid, more correctly named α_1-amido-β_1-naphthol-β^2-carbo-α_2 sulpho acid, prepared by the reaction of sulphurous acid on the nitroso compound of the β-oxy-naphthoïc acid having melting point 216°.

This acid is obtained in the shape of white crystalline needles, sparingly soluble in water, insoluble in alcohol. The alkali salts are soluble in water, and their solutions become brown after exposure for some time in the open air.

The acid solution turns yellow on addition of ferrichloride.

The process of developing with any of the four substances mentioned is analogous to that described in the specification above referred to.

What I claim is:—The herein-described process for developing photographic pictures on coatings of silver chloride, bromide, or iodide, or any mixtures thereof, by treating these coatings in a developing bath containing any of the four substances hereinbefore mentioned.

Improvements in Apparatus for Taking Photographic Pictures.

No. 18,823. Alphonse Alexandre Foiret, 11, Rue Macarani, Nice, France. *November* 7, 1894.

My invention relates to an improved apparatus for taking photographic pictures, so constructed that all the operations necessary for taking the pictures are effected by pressing a single button or knob; that is to say, when the button is pressed, the instantaneous opening and closing of the shutter are effected, the lens is exposed, and the changing of the sensitive plates takes place.

The improved apparatus consists of a rectangular box or camera, in which the whole of the mechanism is contained, but which has no external projection except a small knob or button. The mechanism consists of a spring barrel, round which is wound a cord, the other end of which is wound round a spindle revolving in bearings.

Upon a prolongation inward of this spindle is fixed (in the interior of the camera) a disc, which serves as a shutter, the disc being provided with two opposite apertures, which pass in turn in front of the lens.

The freedom of rotation of the barrel can be regulated by a brake, which is pressed against it by an eccentric upon an adjustable lever, the other end of which carries a stud, which can be adjusted in any one of a series of holes in a guide. The inner face of the disc is provided with two opposite projections near its edge, which abuts against a lever worked by the knob or button described, so that by pressing the latter the lever is disengaged from the top, and the disc makes a semi-revolution, during which it uncovers the lens.

The knob or button also operates two other levers carrying a bar, which is therefore raised and lowered when the knob is pressed and released, and which disengages the front one of a series of frames holding sensitised plates, which accordingly falls forward upon the bottom of the camera, leaving the next plate ready for exposure.

The frames carrying the plates are supported upon strips or frames at the sides of the camera, and are pressed forward by a plate, against which presses a spring fixed to the back.

This plate carries, at its upper edge, a horizontal strip projecting forward, and marked with figures corresponding with the number of frames in the apparatus, which figures can be seen through a small opening in the top of the camera.

Improvements in or appertaining to Lime Cylinders or Cases used in connexion with Magic Lanterns.

No. 24,567. Hermann Bamford and William Bamford, both of 242, Yorkshire-street, Rochdale, Lancashire.—*November* 10, 1894.

Our improvements relate to cylinders or cases used in connexion with magic lanterns, which cylinders or cases are employed for the purpose of storing the small perforated circular pieces or blocks of lime which must be, as is well known, kept in an air-tight cylinder or case, and thus preserved from the influence or effects of the atmosphere.

Our object in connexion with such cases or cylinders, as hereinbefore referred to, being to provide a means in order to obviate the fracture, powdering, or falling of the said limes within the case or cylinder, or fracture, when required to be used, as is of frequent occurrence from the fact of the rubbing action of one upon or against one another, as the limes are, as is well known, of a brittle and powdery nature. We are also enabled by our contrivance to maintain the perforation through the block free from obstruction or impediment, such as lime dust, thereby facilitating their application for the purposes for which they are required, as oftentimes, when the aperture or perforation is closed, the removal of the dust therefrom greatly interferes with the duties of the operator, and frequently results in the breakage of the lime block.

According to our present construction, we provide within the tube, cylinder, or case hereinbefore referred to a spindle or wire of a length corresponding to the length of the case, and provided at one end with a circular disc or plate of a diameter corresponding to the diameter of the case; we pass the wire or spindle into the case, the disc being situate at the bottom of the case. The perforated limes to be stored within the case are then passed on to the spindle until the case is filled, the perforations being thus kept or maintained free and open by such means; the limes are consequently always ready when required for use, obviating the necessity of loss of time or damage as heretofore, the whole of the limes, by our arrangement, being maintained in one mass or whole, obviating independent movement with relation to each other, thus avoiding the rubbing action of one against the other, consequently obviating the powdering or falling thereof.

Lantern Lectures for Winter Evenings.—With the view of bringing the advantages and delights of travel more prominently before the general public, the Association for the Promotion of Home and Foreign Travel has arranged a series of six lantern lectures for delivery and representation at such centres and institutions as may apply for the same. Each lecture, which will be illustrated with about sixty lantern slides, is designed to work out a complete tour, based upon personal experience and from notes taken on the spot, and will lay down a given route, with the cost and time required. The programme includes the most attractive tours in Wales, Ireland, Norway, and Belgium, and the lectures and slides will be lent, free of cost, on giving conditions as to due return. If desired, a competent lecturer will be sent for a moderate fee.

MR. RICHARD KEENE.

We very deeply regret to learn of the sudden and serious illness of Mr. Richard Keene, of Derby, an illness from which the worst may be feared.

Mr. Keene has been so long before the photographic world, and is so well known to many, that a wave of sorrow will pass over the kingdom, and wherever his name is known. No man is more universally respected than he; a good technical and artistic photographer; the head of an art business long since established, and carried on on the soundest of commercial principles, a man imbued with the legendary lore of Derby and its surroundings, and a clear writer on its archæology. Mr. Keene has ever taken a lively interest in the Photographic Convention, from the first meeting of that body, which was held in Derby in 1886, up to the recent one in Dublin, at which he was elected President for the following meeting in Shrewsbury. He was at business on Saturday last as usual, but on Sunday morning he had a stroke of paralysis, and the case is complicated with bronchitis. He has been quite unconscious since the stroke, and the medical advisers look upon his condition with grave concern.

Fortunately, the absence of Mr. Keene from business will not interfere in any way with its being conducted in an efficient manner, as every department has, for a considerable time, been under the special management of competent heads, members of his own family.

Since writing the above, we are apprised by telegraph that Mr. Keene passed away on Thursday (yesterday) morning,

Meetings of Societies.

December.	Name of Society.	Subject.
17	Camera Club	
17	Central Photographic Club	*Elementary Photo-micrography.* C. H. Oakden.
17	Devonport	*Toning and Developing Prints.* J. Crook.
17	Glasgow and West of Scotland	
17	Leeds Photo. Society	*New Lantern Slides.* Godfrey Bingley.
17	North Middlesex	*Enlarging.* H. Stuart.
17	Richmond	Open Discussion.
17	South London	*Bridges: Ancient and Modern.* C. F. Dickinson.
18	Birmingham Photo. Society	
18	Brixton and Clapham	*Architectural Photography: What to Do and How to do it.* E. Dockree.
18	Derby	
18	Exeter	
18	Hackney	*By Stream and Tor.* G. J. Avent.
18	Hastings and St. Leonards	
18	Keighley and District	
18	Munster	Discussion on *Retouching*, introduced by J. O'Connell.—Members' Lantern Slides.
18	North London	
18	Paisley	
18	Rochester	
19	Brechin	
19	Bury	
19	Croydon Camera Club	*The Transferotype Process applied to the Decoration of Glass, Wood, and Porcelain, also to the Production of Lantern Slides.* W. J. Ramsay.
19	Halifax Camera Club	Annual Meeting.
19	Leytonstone	
19	Manchester Camera Club	
19	Photographic Club	*The Humour and Pathos of the Street, portrayed by the Hand Camera.* W. D. Welford.
19	Southport	*Ireland.* J. S. Dickin.
19	Southsea	
19	West Surrey	*Toned Papers as an Aid to Expression in Picture Photographs.* G. H. James.
20	Birmingham Photo. Society	
20	Camera Club	
20	Ealing	*Collodio-bromide Lantern Plates.* Dr. Clifford Gibbons.
20	Glossop Dale	
20	Greenock	
20	Hull	
20	Leigh	*Making Lantern Slides.* W. Crouchley.
20	Liverpool Amateur	*Printing in Gelatino-chloride.* Mr. Anyon.
20	London and Provincial	*A Point in connexion with Plate-coating.* R. Child Bayley.
20	Oldham	
20	Putney	Prize Slides.
20	Oxford Photo. Society	
20	West London	Social Technical Meeting.—Lantern.
20	Woodford	*Photographing of Ancient Wood-carving.* E. Marriage.
21	Cardiff	
21	Croydon Microscopical	
21	Holborn	
21	Leamington	
21	Maidstone	
21	North Kent	
22	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

December 11,—Ordinary Meeting,—The President (Sir H. Trueman Wood, M.A.) in the chair.

The attendance was an exceedingly large one, the room being so crowded that some members had to stand.

The scheme for the incorporation of the Society as approved by the Board of Trade was formally accepted by the members.

Twenty-eight new members were elected, and the nominations of thirty-one candidates for membership were read for the first time.

Photo-engraving with Silver Salts.

Mr. Leon Warnerke gave a demonstration of a process for photo-etching partly dependent on sensitive silver salts instead of bichromated gelatine. Briefly the process may be outlined as follows: A negative of the original is taken in the usual way through a screen (that is, if the *cliché* is desired for letter-press printing), Mr. Warnerke stating that, for the exposure, he preferred magnesium to any other source of illumination. The screen, he mentioned, increased the duration of the exposure by about three times. After the negative is developed and dried, it is given a safe edge. The next step in the process is to place the negative in contact with a sheet of paper coated with gelatine pigmented with a sensitive silver salt, such as the bromide, and making an exposure, the image being developed with pyro-ammonia. After development, the image is pressed or squeegeed in contact with a copper plate previously polished with snakestone and charcoal, the paper backing and the soluble silvered gelatine being removed by hot water in the same manner as a carbon image is developed. After washing and treatment with alcohol, the plate, when dried, is ready for etching with perchloride of iron in the ordinary way. The process, Mr. Warnerke pointed out, might be adapted to photogravure purposes by commencing with a transparency instead of a negative, and transferring the developed negative to the plate grained with asphaltum, the subsequent operations being as usual.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

December 6,—Mr. R. Beckett in the chair.

On the proposition of Mr. Thomas Bedding, seconded by Mr. W. D. Welford, it was unanimously resolved that an expression of the Association's sympathy and condolence be transmitted to Mrs. Kidd, on the death of Mr. R. L. Kidd, of Richmond, who was a member of the Association.

Fading of Albumen Prints.

Mr. A. Haddon read a paper on this subject [see page 788]. An interesting discussion, chiefly of a conversational nature, ensued, Mr. Haddon stating that he would guarantee to produce a print on the vignetted part of an albumen print. With gelatine paper, no image would be obtained in that way, provided the picture were properly printed and washed. The salts washed out of both papers in about the same time.

Mr. A. Mackie quoted some experiments in restoring faded prints. The white parts of the prints contained sufficient silver to develop up into a brown stain.

Mr. P. Everitt referred to his own experiences of albumen printing, and said that over a period of eight or nine years he had not had any cases of fading. It was a question as to whose prints stood the best—the photographers' who worked in bulk or the amateurs'?

The Chairman instanced the cases of some albumen prints that had been exposed for two or three years, and had actually become stronger than when sent out. He was of opinion that prints produced in large numbers stood the best.

Mr. J. S. Teape had fixed a piece of white sensitised albumen paper, passed it through a solution of salt, washed it again, and exposed it to sunlight under negatives. The light action was a bleaching one.

The discussion, which concerned itself very largely with gelatine papers, was continued by Messrs. J. Cadett, W. T. Wilkinson, Bedding, Debenham, W. H. Harrison, and others, and at its close Mr. Haddon received a hearty vote of thanks.

PHOTOGRAPHIC CLUB.

December 5,—Mr. M. L. Troup in the chair.

The Chairman showed a light-tight box, hermetically sealed with moist rubber, for transporting films.

Mr. Tottem showed a label, printed in seven languages, for pasting outside parcels containing plates or films, which was recognised by Continental Customs authorities.

Mr. Foxlee gave some instances of the differences in the marking of the apertures of German and English lenses.

The Chairman asked Mr. Foxlee to continue his experiments, and let the members have the benefit of them.

The Hon. Secretary reported the demise of an old photographer and friend of many, Mr. R. L. Kidd, of Richmond.

Mr. B. J. Edwards proposed, Mr. Bedding seconded, and it was unanimously resolved, that an expression of condolence be sent from the Club to Mrs. Kidd.

Mr. R. R. Beard, the Club lanternist, gave some valuable information concerning limelight jets. He showed some old and new forms of jets, which he described in detail, pointing out the advantages and disadvantages of each. One, made by Otway, was described as a perfect jet. Mr. Beard showed one made by himself—a little elaborate to look at, still one that would give great satisfaction in use. He also spoke of saturators, pointing out that they were coming largely into use. After explaining his theory of the accident which had happened through "pop back," he suggested that a saturator should be used for each lantern; this would do away with any chance of accident. Speaking of limes, he said the most satisfactory to use with the mixed jet was the Nottingham. Limes should be at least five-eighths of an inch from the orifice of the jet if the best result was required.

The CHAIRMAN asked the smallest diameter of tube Mr. Beard would use when taking house gas.

Mr. BEARD said not smaller than a quarter of an inch bore.

Mr. BRIDGE asked which was the best form of saturator.

Mr. BEARD said all were good if the supply of ether was sufficient. If one shut off the hydrogen, and got the lime incandescent, then one could tell at once of a dangerous compound, and it was simply a case of shutting down at once.

Mr. SINCLAIR asked what was the most satisfactory opening for the nozzle of the mixed jet.

Mr. BEARD said one-twentieth, or a little more, might be used with advantage, and in the blow-through one-twenty-fifth.

Mr. CHILD BAYLEY asked if there was any advantage when using two points of the lime.

Mr. BEARD said he invariably used the top first.

Mr. WELFORD said that he thought that the cause of explosions with ether saturators was that people were too careless. They did not go to a show with a short supply of gas; why, then, should they go with an insufficiency of ether?

A hearty vote of thanks was passed to Mr. Beard for his information.

Mr. B. J. EDWARDS read a short paper in reply to a former communication of Mr. Watkins, entitled, *Control in Development* (see page 789).

Mr. COWAN disputed the correctness of Mr. Edwards's designation of his sensitometer that he used. It was formed by the superposition of sheets of tissue paper, first one sheet, then two, and then three, up to ten thicknesses, and he (Mr. Edwards) called it an arithmetical one, whereas it was a geometrical one.

Mr. W. T. WILKINSON said that one might go on talking all night when discussion was based on different developers. The true facts could only be arrived at by using amidol for developing.

Brixton and Clapham Camera Club.—December 4.—Colonel Gale, at the invitation of the Club, showed a series of his slides, entitled *Odds and Ends, Old and New*, to an audience both large and appreciative. The subjects need not be detailed, being characteristic and worthy of the reputation the Colonel has gained. The Chairman (Dr. Reynolds), in proposing a vote of thanks, which was most heartily accorded, said that without doubt they were a collection of gems, and the finest series the Club had ever had the privilege of seeing, although not a few masters had honoured the Club on previous occasions. The holding of weekly meetings, tried as an experiment this session, seems to meet with the approval of the members, the attendances being, if anything, better than at the fortnightly. Recent evenings have been occupied with demonstrations of flashlight photography, carbon printing, and by special instruction classes. A competition for lantern-slide workers (fifteen slides, illustrative of *Holiday Work*, with reading), was lately decided, the Club's bronze medal being awarded to Mr. John Gunston, and a certificate for second place to Mr. T. Buck. The judging, being by popular vote, afforded a very entertaining diversion from the usual Lantern Show. The Club is at present busily engaged in arranging a week's open Exhibition next March.

Croydon Camera Club.—The Lantern Show on Wednesday, the 5th inst., at the Braithwaite Hall, again drew a full audience, largely attracted, no doubt, by the opportunity afforded of hearing Mr. H. Snowden Ward describe his experiences of a trip to Chicago, illustrated by a diversified and, both technically and intrinsically, attractive series of slides. Many of these elicited unmistakable approval, specially a series of sunsets taken by one of the party on the journey across the "herring pond," and also telling view of Niagara in winter. The unceasing flow of talk with which Mr. Ward accompanied the above included many anecdotes, notes, and impressions which he had picked up during his trip, and which the audience evidently found very relishing. The second part opened with *A Vacation in Wales*, which Mr. E. A. A. Woodcock, who made the slides, explained, the subjects, some forty in number, giving much satisfaction. The remainder of the slides were described by the President (Mr. H. Maclean, F.G.S.), who read a letter from the Hon. Sidney Herbert, M.P. (a Vice-President of the Club), received that morning, hoping the Club would have a successful evening. Amongst the subjects illustrated by a series of views were *A Visit to Deepdene, Beating the Bounds of Croydon* (which provoked much interest, and reflected great credit upon Mr. J. Smith, who took the series of snap-shots), and *Croydon Fair* (which included some unusually telling instantographic views by George Cordon), also a very fine collection of seacoast pictures, by Mr. H. E. Holland, some commendable scenes by Mr. Burn, a few notable contributions by Mr. Wreford, and various subjects by Messrs. Hirst, Frost, Noaks, Jenkins, and Maclean. The lantern was well served, being in the capable hands of Mr. J. Ryan. During the evening the President dwelt upon the educational power of the lantern and photograph, especially in teaching the arts and sciences; he expressed his wonderment that the lantern was not regularly used in the local Board schools, in the School of Art, and in the Whitgift Schools, and trusted that, attention being directed to the matter, it would not be long before this valuable auxiliary in making the path to knowledge easy is adopted by the above institutions.

Ealing Photographic Society.—December 6.—The usual monthly Lantern Evening was held in the Prince's Hall Public Buildings, Ealing, a large number of members and friends being present, Mr. H. W. Peal in the chair. The minutes of the previous meeting were read and confirmed. Upwards of 200 slides were shown during the evening, some of them being of exceedingly high quality, notably those of Mr. George Hankins, the winner of many medals, including the bronze medal in the open class at our own Exhibition. Mr. C. N. Peal officiated at the lantern. The first slides shown were those by Mr. Hankins, they were technically and artististically good, and elicited much applause. Next were shown slides by the Rotherham Photographic Society and the Holborn Camera Club, both sets being kindly lent by the Royal Photographic Society; then followed numerous slides by our own members. Messrs. Peal, Phillips, Fryer, A. E. Smith, Crisp, and Dawson, all showing. Some of these slides were excellent, possibly the most popular being Mr. H. W. Peal's yachting studies and Mr. Fryer's comical portraits.

Hackney Photographic Society.—December 4, Mr. G. J. Avent presiding,—Mr. A. BARKER asked whether members had experienced loss of power in metol developer during cold weather. In reply, several of those present spoke of similar experiences, not only with metol but with amidol and other developers. Mr. FORT thought that lowness of temperature had more effect on metol than on amidol. Mr. S. J. Beckett showed models of a new posing chair and a new studio camera. The latter was a most ingenious instrument, and much admired. The Rejlander slides were then shown on the screen, and a collection made on behalf of Mrs. Rejlander, after which members' slides were shown.

Putney Photographic Society.—December 3, Dr. Sheppard in the chair.—Mr. J. R. GOTZ gave a demonstration of his new celloido-chloride emulsion papers. He said gelatino-chloride emulsion papers were first introduced by him to the English market in 1886, they having been commercially produced by Obernetter in the previous year. These papers can be printed out or developed, but for the latter purpose the celloido-chloride papers which he was now introducing will be found more successful. Various papers were demonstrated with, such as gelatino-chloride by development, celloido-chloride by development, in the case of the latter paper printing out or development being optional. A new kind of paper was also shown which will print sufficient in five to ten seconds in diffused daylight, printing out not being optional, a characteristic of this paper being, though a development paper, sufficient image is seen to gauge whether the exposure is correct. Prints made by Mr. Gotz by gaslight, showing only a very faint image, were developed and toned, the following being the formulæ used:—Distilled water, 100 cm.; pyro, 1 gramme; citric acid, 1 gramme; sulphite of soda, 10 grammes; and ten per cent. solution sulphite of soda is handiest for this. For each ounce add 5 grains pyro and 5 grains citric acid. Development must take place by a yellow light washing for ten minutes in running water, and subsequently toning by following bath:—Water, say, 20 ounces; hyposulphite of soda, 4 ounces; sulphocyanide, 1 ounce; alum, 1¼ ounces; acetate of lead, 1 ounce. When clear, add 1½ ounces of one per cent. gold solution. After toning, wash for about one hour. Matt surface celloido-chloride papers are also made, and, though they do not tone so quickly as the glossy papers, they are not so likely to go wrong chemically. With all the papers it is best to stop development by the use of water, in which a small portion of common salt has been dissolved. A vote of thanks to Mr. Gotz was unanimously accorded.

Richmond Camera Club.—At the meeting, on Monday, the 3rd inst., to the deep regret of those present, the death was announced of Mr. R. L. Kidd, in whom the Club lose an active and valued member, and several of the members an esteemed personal friend. Mr. Ennis presided at the meeting, which was devoted to a show of slides. In addition to members' work (which included some very effective pictures of the late floods in the neighbourhood, by Mr. Purcell and Mr. Gibson), two sets of slides, by the Manchester and Leeds Societies respectively, which had been lent by the application of Photographic Societies, were shown, Both of them contained many excellent specimens.

West Surrey Photographic Society.—December 5, Mr. J. Bulbeck in the chair.—One member was elected. A Lantern Night, when slides were exhibited by Messrs Bond, Gresswell (Norwegian scenery), Horne, Joy, Thompson (including one of the late floods at Surbiton), Ward, White (the results from a neglected excursion), and Wilshere.

Bolton Photographic Society.—December 4.—Drs. JOHNSTON and BARR gave an account of their recent tour in Italy. The joint lecture was based upon a splendid collection of "snap-shots" taken in a three weeks' journey, the slides of which were thrown upon the screen by a powerful lantern, manipulated by Mr. Leach. The whole evening was most enjoyable and profitable to the members and visitors present, and at the close a hearty vote of thanks was accorded, on the motion of Mr. Rawsthorn, seconded by Mr. Newton.

Darwen Photographic Association.—December 6.—Messrs. E. J. BROWN and F. A. ABBOTT gave a demonstration on the working of zenotype. Mr. Brown developed and toned twenty half-plate prints in the very short period of about half an hour, in a 10×8 tray, varying the tones from the lovely zenotype brown to a beautiful rich green, which is unsurpassed for the effects produced in landscape work, especially with much foliage, making the picture to represent more of the character of an oil painting than a photograph. Mr. Abbott informed the audience that this tone is only attainable by the addition of a few drops of zenochrome, a solution of their recent invention, which has only for the third time been used before the public, and has not yet been placed in the market. The best results were produced on Otto, Citos, and Ilford papers, although equally good results are obtained on other papers with zenotype as with gold if properly manipulated, but the above are the papers recommended for the purpose. The lecturer afterwards applied to the audience for prints, and toned them to their requirements. The President and Secretary then toned a quantity of prints which the members had brought for development, with the previous satisfactory results. The usual vote of thanks was heartily bestowed upon the two gentlemen who had so kindly taken the trouble to journey from Liverpool to demonstrate the process of zenotype, and, in response, Mr. Abbott said they had spent a very enjoyable evening, and, at the same time, wished to mention that they were going to introduce an agent for developing gelatine chloride papers with a few seconds' exposure to gaslight, when they might have the pleasure of paying us another visit. The Association feel deeply indebted to the two gentlemen, and hold the honour of having had a personal interview with the inventor of zenotype. I would also like to mention that zenotype facilitates photography to a great

extent, dispensing with all washings other than the final, and enables one to produce any range of tone with the same solution, and still better results can be obtained by using different makes of paper according to the tone required, as given with the directions.

Liverpool Amateur Photographic Association.—The second of the series of practical demonstrations in Photography was delivered by Mr. F. ANYON, on December 6. He explained the theory of development of the photographic image, and practically demonstrated the method of controlling development when dealing with prolonged exposures. Many valuable hints were thrown out, and the demonstration was much appreciated.

Rotherham Photographic Society.—December 4, Dr. Baldwin (President) in the chair.—Large attendance of members. The annual Exhibition (non-competitive) was fixed for two days in the middle of February, when it is hoped there will be a good display of survey prints, in addition to the usual specimens of members' work, and a loan collecsion of photographs. The lantern was used for the first half of the evening, members' slides being projected and criticised. An enlarging lantern had been purchased for the Society's use, and it was on view. A trial of its capabilities was made.

Sheffield Photographic Society.—December 4, the President (Mr. Firth) occupied the chair.—Mr. T. G. HIBBERT gave a practical demonstration, *Development with the Brush*, in the course of which he developed two negatives, showing how, by a judicious use of the brush in applying various strengths of developer, a great improvement may be made in bringing out retail in the heavy shadows, at the same time keeping the high lights clear.

Widnes Photographic Society.—December 5, the President (Mr. V. C. Driffield) in the chair.—A demonstration was given by the Zenotype Company, of Liverpool; the inventor of the zenotype process, Mr. E. J. BROWNE, was the demonstrator. Mr. Browne developed and toned several prints on Ilford, Citos, and Otto P.O.P. respectively, producing a variety of tones ranging from sepia through the browns and reds to purple, some of which were much admired. The rapidity of the developer, the variety of tones obtainable, and the apparent simplicity of the process created much interest amongst the members present.

FORTHCOMING EXHIBITION.

1895.
March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A NEW THEORY OF NEGATIVE FROM NEGATIVE BY CONTACT.

To the EDITOR.

SIR,—In order to explain the fact that a negative image may result, when we develop a photographic plate which has been exposed to bright light beneath a negative in contact with it, the term "reversed action of light" has been employed. This explanation seems inadequate, because of the lack of evidence of such actions in other cases of over-exposure, where, by analogy, it might be expected to be found. The workers who have, from time to time, communicated to THE BRITISH JOURNAL OF PHOTOGRAPHY the results of their experiments in this field (vol. xxxix. p. 638; vol. xl. p. 389), agree in stating, that sometimes on development an over-exposed *positive* image first appears, and that this fades away as the negative image becomes more intense. This substitution of the negative image for the positive I have myself frequently observed. Have we not here, then, evidence of the presence, on the plate, of *two* images, viz., a thin, over-exposed positive image and a negative one of normal density? The second (and only useful) image is probably due to light *reflected* from the silver of the negative, the latter having, in fact, played towards the sensitive plate (in addition to its usual *rôle*) the part of a "positive on glass," the intense light employed in making these negatives, being a favourable factor.—I am, yours, &c.,

Mexborough, December 10, 1894. JOHN HENRY PAYNE, F.I.C.

FADING OF SILVER PRINTS.

To the EDITOR.

SIR,—In asking space for a few remarks on this subject of perennial uneasiness to photographers in the JOURNAL under your able editorship, we feel assured that they will be considered, at least by yourself, in the light of a full and necessary knowledge of the chemistry of the subject.

What strikes us most forcibly in the recent correspondence is that, while tilting at starch, a comparatively stable compound, the writer seems to lose sight of the very unstable and complex constitution of albumen and gelatine.

Their relative proneness to decomposition may be realised by a comparison of their formulæ:—

Starch ..... $C_{12}H_{20}O_{10}$
Gelatine ..... $C_{24}H_{40}N_8O_{10}$
Albumen per cent. ..... $C_{72}H_{7}N_{15}O_{21}S_2$.

Few who are conversant with the tendency of complex organic bodies under disturbing influences, such as air and moisture, to break up into simpler arrangements of their elements, will fail to recognise which of the foregoing bodies is most likely to be responsible for the fading of photographs.

With regard to the formation of acetic acid in the prints mentioned by one of your correspondents, we hesitate to assert that it would be impossible to manufacture that acid from starch, but we must say we think it an unlikely reaction, as will appear on consideration of the stages. The starch must first be converted into grape sugar (glucose), this would pass on into alcohol, and the alcohol be oxidised to aldehyde before the acetic stage is reached.

Does it not seem more reasonable to assume that the joint action of air and moisture has really induced a disruptive action on the more complex albumen, and that, as a consequence, an *un*mounted print would, *cæteris paribus*, show signs of so-called fading?

Admitting for a moment that starch *may* undergo a change unfavourable to the permanency of photographs when spread in a thin film between the picture and the mount, we cannot admit that the souring of a mass of starch in a basin is a parallel case, for in the latter case the aldehyde and alcohol, *if found*, would be retained, and so perhaps pass into acetic acid, while, in the former, being volatile bodies, they would be dissipated as soon as formed and "vanish into air, into thin air."—We are, yours, &c., MARTIN & Co.

General Photographic Works, New Southgate, N.

THE SULPHOCYANIDE TONING BATH.

To the EDITOR.

SIR,—It would be interesting to know if any other users of the sulphocyanide bath have had experiences similar to those of the writer of the letter (received by me last week) from which the following is an extract:—"This bath makes me feel very ill after I have been working with it; sick and cold, and all round my nails are sore; also people who have been in my dark room with me feel upset."

The widespread use of this salt, and the fact that some writers have alluded to it as being comparatively innocent, indicate that more attention should be paid to its powerful poisonous properties. Its action on gelatine would seem to suggest that the fingers should not be placed in its solution more than necessary.—I am, yours, &c., PHOTO-CHEMIST.

December 10, 1894.

PHOTOGRAPHING AT THE ZOO.

To the EDITOR.

SIR,—My attention has been drawn to an article by "Dexter" in your Annual for 1895. Certain sentences therein, which I used in two articles of a somewhat similar title in the Annuals for 1889 and 1894, have been criticised and my statements doubted. First of all, it will be generally acknowledged, to say the least of it, very bad taste on the part of the writer, under cover of a *nom-de-plume*, to wait twelve months in order to attack any one through a medium wherein no reply can be inserted. I will pass over the apparent ignorance shown as to which Zoological Gardens were referred to; I thought every one knew the Bartlett family was associated solely with those in London. That my name was removed by the Secretary from the free list at the instigation of some one is news to me, for the very reason that some years ago I wrote to Dr. Sclater to the effect, that I felt I could no longer trespass on the kindness extended towards me in the form of a free artist's pass, but should feel grateful if I might continue my photographic studies, at the same time paying for admission. This request he granted, and I received by post a letter granting me this permission for twelve months. From that day, years ago, I have not seen that letter, and I have visited the "Zoo" scores of times, generally with two cameras. During the whole of that period I was never once asked for a "permit," or to desist from taking photographs, or even "rushed out" by any one, not even by young and powerful fifteen-stone keepers, for the very reason, to the best of my knowledge, there are none.

Many of the hundreds of photographers I have spoken with could corroborate all I have said. There may be some such rules at Hanover-square, but on excellent authority I understand no definite instructions have been given to the officials to carry out such extreme measures as stated by "Dexter." On reading the article in question I at once went to Mr. Bartlett, sen., and he agreed with me that the contents, and particularly the paragraph as to the "rushing out" of ladies and gentle-

men photographers, was much to be deplored and calculated to give the "Zoo" and the officials a bad name.

I regret, Mr. Editor, that I have laboured under the disadvantage of not knowing the writer's name, and at first I had intended to ignore the practically anonymous article in question, but I felt it would only lead into further correspondence, and which I do not intend to be drawn into. Thanking you much for allowing me to trespass so much on your space,—I am, yours, &c., LEWIS MEDLAND.

Kimberley, North Finchley, N.

BLACKBALLING AT THE ROYAL.

To the EDITOR.

SIR,—The letter published in your last issue from Mr. Chapman Jones's candid friend—"An Old Member"—is interesting, as affording evidence that there still exists at least one person who looks back with regret to the old days of the Photographic Society, when favour was a factor in the bestowal of its honours; but Mr. Jones will hardly thank his somewhat indiscreet supporter for so pointed a suggestion that he is the most likely person to carry out the retrogression desired. If "An Old Member" intends his narrative of how his pictures were not treated with the partiality which he considers due to him as an old member and exhibitor, as an illustration of the mischief done by what he terms "a faction," he has chosen a singularly inapt example, and the bearing that the rejection of his pictures by the Hanging Committee of the Exhibition has on the right of the members to reject any candidate for admission to the Society whom, for any reason, they may think undesirable as a member, he has not made very clear.

Upon the blackballing incident I notice there appears, in one of your contemporaries, a letter from Mr. H. P. Robinson; but here we have a writer of entirely different calibre. If we cannot always agree with Mr. Robinson's opinions, we can, at least, always find something to admire in his literary style. When he treats of a congenial subject, such as art and its photographic connexions, his words flow with the ripple and sparkle of a meandering streamlet beneath a sunlit sky; but when a polemical subject is the mission of his pen, the torrent of his words rages like a mighty river swollen by the winter's rains. Fearless, he impetuously pursues his course, never attempting a defence, for when he is angry he is nearly always in the wrong, but relying upon a vigorous and dashing onslaught, he seeks to annihilate his opponents. Logic he has no sense of whatever. He will bring forward an argument in one paragraph and controvert it in the next without the slightest perception of what he has done. In idealising facts to suit his immediate purpose he is inimitable, and the reckless way in which he throws stones at his own windows, as it were, is as astonishing as it is damaging to himself. Who, in Mr. Robinson's position, except Mr. Robinson, would venture to call upon the Society to purify itself at the present time, when it is still fresh in our memories that it was the first step in the process of its purification that led to Mr. Robinson's secession? Who, in Mr. Robinson's position, but himself, would have the daring even to hint that reforms were necessary when the suggestion invites the comparison of the progress of the Society in the past three years with its stagnation during the twenty or so when he was a leader in its counsels? Who, again, but Mr. Robinson, would have the hardihood to speak of the Society's medal as "a doubtful distinction," when the time when he considered it a great distinction is not so far distant that we cannot remember that, in those days, any one who could produce a work a trifle above mediocrity was sure of being its recipient? Who, after having had the virtual control of the Exhibition for a long series of years, and having left it in the same state as he found it, except for the natural advance for which time and the progress of photography alone are to be thanked, would consider it reasonable for his successors to do, in a year or so, that which he failed to do in ten times the number? Who would taunt the Society upon the molehill errors of its present administration after the mountainous blunders, and worse than blunders, that he had countenanced? There is but one man. But, fortunately for himself, no one takes him seriously, or, at least, no one who knows him. However, we can well afford to grant him the poet's licence and to forgive the fiction of his facts, which deceive neither himself nor anybody else, in consideration of the gracefulness of the verbiage in which he clothes them.

In spite of his idiosyncrasies, which would overwhelm any ordinary individual, no one can know the man personally without liking him, or, after an hour spent in his society, can bear him animosity. His heart is in the right place, though his head may sometimes lead him into difficulties. His bark is very loud and deep, but his bite is very tender. Enemies he has none, except creatures of his own imagination, and that implacable one—himself. To me, his presence acts as a tonic. His originality, his boundless admiration of himself, his apparently firm belief that photography was invented expressly for his own especial benefit, and his bluff geniality, are as refreshing after intercourse with ordinary mortals, as a breeze direct from the ocean. Long may he live to delight us with his writings and his pictures, and, may I add, to amuse us with his antics.

I am afraid, Sir, that my wandering pen has led me to a panegyric of our friend Robinson and from the business of my communication, which is to express my opinion on the blackballing of Mr. Horsley Hinton. If the statements in Mr. Sinclair's letter are facts, and those facts were known, I am surprised that a dozen or so blackballs were all that were recorded against him. The question involved is a very simple one. Was the election carried out according to the laws of the Society? If so, and there is no evidence to the contrary, the candidate blackballed was duly rejected, and no one has a right to inquire what motives actuated those who recorded their votes against him.

In a letter from Mr. Hinton, which you published a fortnight ago, that gentleman casuistically endeavours to obscure the issue by confounding the excellence of a work as a work with the personal attributes of the individual who executed it, and, inferentially, he informs us that he is not socially obnoxious, and that he possesses the qualifications of merit and good character. That, of course, is his own estimate of himself, and, being so, we may take it for what it is worth. The duty of the members when a candidate is proposed for election is to decide whether the admission of that candidate is likely to benefit the Society. Does Mr. Hinton's record of the past three years show that he is likely to work in the interests of the Society or to benefit it? Pass in review his actions and study his writings—then answer. Mr. Hinton must remember that he is but a very young man yet, and that, although he has achieved some success as a photographer, his position is not firmly enough established to enable him to ride roughshod wherever his fancy may dictate. If he will curb his ambition for a while, he may well hope to be as successful in his career as his colleague and mentor, Mr. H. P. Robinson. He possesses many of the necessary qualifications—a ready pen, a dictatorial manner, a profound belief in himself and his own importance, an amount of modesty microscopical in its proportions, and a combative disposition. I am not disparaging these qualities, for, when tempered with prudence, they are those which lead to success in life. They are powers for good or evil according to the way in which they are used.

Mr. Robinson, in the letter which I have referred to, hopes that this blackballing incident may not only be "a storm in a teacup," but "a thunderstorm," and tells us that the situation demands "an earthquake." That is just like the dear old boy; he always talks as if he was accustomed to employ Jove's thunderbolts to crack nuts. There is no fear of a thunderstorm, still less of an earthquake, but we would welcome a beneficent shower to clear away the last traces of the grime which accumulated during long years of stagnation and maladministration.—I am, yours, &c., ANOTHER OLD MEMBER.

To the EDITOR.

SIR,—Lest, after certain letters in your issue of last week, especially Mr. Sinclair's, silence on my part should be misunderstood, will you kindly allow me to say that, when the interesting topic in which my name is involved appears to have worn itself out, I will, with your permission, reply to all at once. I regret I have no time for a week-to-week discussion.—I am, yours, &c., A. HORSLEY HINTON.

Camera Club, December 11, 1894.

[So far as we are concerned, this topic has quite worn itself out, but we shall be pleased to afford Mr. Hinton the opportunity of a rejoinder.—ED.]

YORK'S LANTERN SLIDES.

To the EDITOR.

SIR,—Referring to Mr. W. Hume's page (C) advertisement in your supplement of 7th inst., we have had many letters from customers asking how he can quote our slides at such *low* prices. We think Mr. Hume might have worded his advertisement in a less ambiguous way, so that readers would know that he was having what *we* take to be a *clearing-out sale* of *slides*. The quotations given in above are *not* the regular retail prices of our goods, which are as follows:—Plain slides, 12*s*. per dozen; coloured slides, 24*s*. per dozen.

Thanking you for your courtesy in inserting this letter,—We are, yours, &c., YORK & SON.

87 *Lancaster-road, Notting Hill, W., December* 11, 1894.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—At the meeting of the Photographers' Benevolent Association held last night (December 10), I was instructed by the Committee to state, through the Press, that the report which has found some circulation, and which has been published in certain photographic papers, to the effect "that the Photographers' Benevolent Association is about to be dissolved," is incorrect. There is no intention of giving up the good work that the Association is doing, and which has increased enormously during the past year, but the Committee is very carefully considering a scheme by which it is hoped that the usefulness of the Association will be greatly increased, and whereby it will be made worthy of the present

status of photography. I am instructed to prepare and send to you for publication next week, if you will kindly afford the space, a brief statement of the work of the Association during the past year, and to add to that statement an urgent appeal for further support. Never before have we relieved so many cases or distributed so much money, and it is many years since the income was so small as it has been in the closing year. Our accounts are made up to the end of December, so that there is still time for the friends of photography, and the Benevolent, to prevent our balance showing the worst income since the formation of the Association, which it will do unless greatly increased support is quickly forthcoming. The Benevolent has never before been short of funds.—I am, yours, &c.,

H. Snowden Ward, *Hon. Secretary.*

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the Editor.

Sir,—In reply to Mr. Elliott's letter in your issue of November 30, page 767, the National Association of Professional Photographers never claimed in any way, directly or indirectly, to have had anything officially to do with Mr. Whitlock's case against the illustrated papers for infringement of copyright in his portrait of the late Lord Chief-Justice Coleridge.

This case related to a professional photographer, who has given, like many others of his brethren in the National Association of Professional Photographers, much hearty support, in time, labour, and money, to support the interests and happiness of the professional photographer.

Naturally the case was referred to at the meeting on November 9 as a vital question for the profession; it received the full discussion it deserved; it constituted part of the *Proceedings;* for all of which it certainly was not needful to ask the permission of the Photographers' Copyright Union or Mr. J. J. Elliott.

It was a case of exceptional clearness, legally considered. Mr. Whitlock took the portrait himself, and immediately secured his property by copyright. There is not the slightest doubt his case would have been won by placing it in the hands of his Birmingham solicitors, who would have taken the necessary proceedings to compel acknowledgment and payment by the parties infringing. It was impossible to dispute either the copyright or the infringement.

Doubtless the delay and opposition made by the proprietors of the illustrated papers was the natural feeling of not wanting to "cave in" to the Committee of the Photographers' Copyright Union.

If Mr. Whitlock had acted for himself, through his solicitors, the "cash payment" would have been a very much larger one, the wool from all the "cry" being about 4*l.* 1*s.* 6*d.* net., viz., 10*l.* paid; deduct the charges made by the solicitors to the Photographers' Copyright Union, 3*l.* 13*s.* 6*d.*; deduct fares and expenses for the two visits to London by Mr. Whitlock, at the urgent request of Mr. Elliott and the Committee of the Photographers' Copyright Union, say, 2*l.* 5*s.*, leaves the gain to Mr. Whitlock of about 4*l.* 1*s.* 6*d.*, apart from loss of time.

As Mr. Elliott says, "Comment is needless." Quite so; in fact, comment was needless on the part of Mr. Elliott!

So far from Mr. Whitlock having made "repeated applications for the Union to take up his case," the appeals and the letters came from Mr. Elliott, on the part of the Committee of the Photographers' Copyright Union.

Mr. Whitlock yielded to their solicitations, because they knew the importance of such a "trump card" as a start for their Association.

I am too strongly in favour of the Photographers' Copyright Union to wish to say a word to decry their intentions, efforts, or acts, and have a great personal respect for Mr. Elliott in connexion with the movement. But the attack he made on the National Association of Professional Photographers, having been followed by an editorial note, accusing us of "laying claim to things it has not accomplished," compels me to write this letter. As a prominent member of the Photographers' Copyright Union said in a recent memorable letter, let us have facts, not "truth half garbled."—I am, yours, &c.,

47, *Charlotte-road, Birmingham,* D. J. O'Neill,
December 10, 1894. *Secretary N.A.P.P.*

THE MEDAL-HUNTER'S PARADISE.

To the Editor.

Sir,—Your report of the Stanley Show (Photographic Section) was so exceedingly fair and unbiassed, and yet candid, as usual with The British Journal of Photography, that it is with regret I have to correct you upon one point. But please consider that, in so doing, I only imagine that the remark was made hastily, and without any intention of being unfair. Your report stated, "They disposed of nineteen medals, so that, whatever objection may be taken to this Exhibition on the score of its being merely a side show to a display of bicycles, it is at least entitled to be regarded as a medal-hunter's paradise."

Figures may be made to prove anything, it is said. Certainly in this case they are very much against your assertion. Taking the recent exhibitions, and dealing with the pictures (lantern and stereoscopic slides counted as one exhibit for each set) in the competitive classes only, the result is as follows:—

	Exhibitors.	Exhibits.	Awards.
Hackney	79	483	16
Ealing	59	272	14
Stanley	182	685	19
South London	98	511	20
Leytonstone	78	233	17

and if from the above we calculate the percentages of awards, compared respectively with exhibitors and exhibits, we get the following:—

	Awards to Exhibitors.	Awards to Exhibits.
Hackney	1 to 5	1 to 30
Ealing	1 to 4	1 to 19½
Stanley	1 to 9	1 to 37⅔
South London	1 to 5	1 to 25½
Leytonstone	1 to 4⅔	1 to 13⁴

I think this proves pretty conclusively that the Stanley Show was really less a medal-hunter's paradise than any of the other Exhibitions. If your contention lies in the fact that nineteen medals were there awarded as against a less number at the other Exhibitions, except South London, please contrast the following:—

	Exhibitors.	Exhibits.	Awards.
Stanley	182	685	19
Leytonstone	78	233	17

These figures speak for themselves and need no further explanation from yours, &c.,

Walter D. Welford,
Manager Photographic Section, Stanley Show.

THE DECEASE OF THE CENTRAL CLUB.

To the Editor.

Sir,—I see by your last impression that the great Central Photographic Club, which, only about a year ago, was offering to take all the principal London Societies under its paternal umbrella, has ordered its coffin. Does it want an epitaph? If so, I would suggest two well-known lines. They were, I believe, originally written on the death of an infant who only lived a few days; but that don't matter:—

"If so soon that I was done for,
What on earth was I begun for?"

—I am, yours, &c.,

Drop Shutter.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatu in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted *Sketch* from No. 40 in exchange for photographic materials, &c.—Address, Edward Norton, Wells, Somerset.

Photographic News, fourteen volumes, 1875 to 1888, in exchange for half-plate field camera, or 9×7 ditto, not particular if out of repair, or quarter-plate lens by known maker.—Address, W. J. Watson, 3, Lower-terrace, Notting-hill, W.

A 9×7 camera, with focussing screen and dark slide, collapses at side into a portable shape, very light, weighs ten pounds, suitable for enlarging or studio camera, exchange for good quarter-plate lens.—Address, S. E. Kelf, 189, Southampton-street, Reading.

Wanted, an oil enlarging lantern with eight-inch condensers for half-plate negatives. Will exchange for same a whole-plate camera, leather bellows, double extension, swing and reversing back, and one double dark slide. Also nine-inch bar burnisher, fitted with gas burner; also three new half-plate and three whole-plate printing frames.—Address, W. Restall, East Lavant, Chichester.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

HYPO.—Not received.

EXO.—Use one of the metol-hydroquinone developers given on p. 823 of the ALMANAC for 1895.

J. W. F.—Barnard & Son supply colours specially for the purpose. Any artist's colourman in your district will procure them for you.

A. M. Z.—1. Yes, we believe so. 2. No, we do not understand him to go so far as that. See a paper by Mr. B. J. Edwards on this subject in the present number.

H. C. (Stockport) inquires: "What will precipitate silver from negative fixing bath?"—Sulphide of potassium (liver of silver) will throw down the silver as a sulphide.

E. A. HOLDSWORTH.—The photograph is probably from a negative taken by Mr. W. Cobb some years ago. Messrs. Marion & Co. may be able to supply you with a copy.

T. M.—If the assistant has taken himself off without having given a week's notice, you can proceed against him for an equivalent of his week's salary in the County Court.

A. WAITE.—Had you looked through the advertisement columns of the JOURNAL for the past few weeks, there would be no necessity to ask where Christmas and New-year's photographic mounts can be obtained.

GUEST.—We can give no particulars of the "wedding" beyond what was stated in the paper, as to how it is to be consummated. You are not the only one who seems interested in the matter. The author will probably publish details shortly, as he has given it such publicity.

AUTOGRAPH.—You are quite at liberty to make photo rubber stamps in the manner you describe. This was done many years ago, no patent having been obtained for the method of doing so. Of course, patents may be taken either by yourself or others, but they would be quite worthless.

E. R. C.—The simplest way to clean off spoilt gelatine negatives is to soak them for a day or two in cold water, and then immerse them in hot water. The film will then quickly dissolve off. After the plates have been soaking for a day or so, the film can often be quickly removed by scraping it off with a knife, or a flat piece of wood used as a chisel is often used.

W. PILKINGTON.—The object of the formulæ in the ALMANAC is intended for ready reference, and not to give full working details of the various processes in which they are employed. To do this in any useful way would be to increase the matter in the volume to perhaps double its present bulk. We can only refer you to back pages of the JOURNAL for the different working minutiæ.

H. W. B.—The only suggestion we can make is to send examples of the best pictures you have taken to the Exhibitions of small societies that offer medals. That is the system usually pursued by the recognised pot-hunters. By a steady pursuance of this plan, a large number of medals may be quickly acquired. With some, a medal is a medal, whether from the Little Pedlington or any other Society.

A. F. WILLIAMSON.—We are not sure, but we believe the Jena glass factory is not represented by any agents in this country. This is easily ascertained by writing to it direct. However, whatever kind of glass is made there is, of course, obtainable direct from the works, even if there is no agent for its supply here. We have no reason to surmise that they restrict their business solely to professional opticians.

T. OSBORNE.—Gum acacia is simply what is known as "gum arabic." It is very generally described as a mountant for photographs, but, we think, on quite unauthentic grounds, provided the gum be of the best quality (it will answer) and the solution is used freshly made. Some of the oldest photographs we have, dating from the "fifties" and "sixties," were mounted with gum, and they are yet more perfect than many only two or three years old.

BROWN.—1. Any lens that will give sharpness with an aperture of *f*-5·6 will do quite well for cabinet portraits. 2. If to the books you already possess you were to add Bigelow's *Treatise on Lighting and Posing*, you would require nothing more. The last-named book is invaluable, but it is difficult now to obtain a copy. 3. Ground glass is often useful in the side windows of a studio, to which dark buildings might prevent the free access of light. In your case it will be better to use plain glass.

R. O. S. E.—To give any positive opinion as to the cause of failure in the so-called Klic process by merely seeing an impression from the plate is quite out of the question. To do that, one must see the operations performed. We are inclined to think, by the print before us, that the bitumen ground was over-heated, so that, instead of being granular, it was made nearly homogeneous. But this opinion must be taken as mere speculation. Had fuller particulars been furnished, the opinion might have been more definite.

B. B. SCOTT.—1. This correspondent, *inter alia*, desires to know the meaning of certain figures occasionally found attached to the names of certain chemicals which she enumerates, and also whether they do or do not serve to indicate their strength; and, if so, how?—1. Our fair correspondent will find a reasonably full reply to her various queries embodied in a leading article in the present number. If anything remains in doubt, let her write again. 2. Yes, the ALMANAC can be sent to Spain, if she will give the full postal address by which she can be reached.

THOMAS HILLMAN writes: "I should feel obliged if you can tell me the best way to mix the colours used in finishing bromide enlargements with the brush. I have been using Indian ink, but it dries dull, and shows distinct from the print. Those sent out from the large firms scarcely show at all."—Indian ink varies much in tint, so do bromide enlargements, consequently the colour used must be adapted to the enlargement. This can only be done by an admixture, say, with the Indian ink of a blue and perhaps a red, according to circumstances. A little gum water will give a gloss to match that of the photograph.

ANXIOUS writes: "I should be much obliged if you would be good enough to tell me how it is I get so little for my residues. I use liver of sulphur for precipitating. The last lot I sent was the precipitate of about a ream of solio paper, and about 200 whole-plate negatives. The liver of sulphur cost 5*s*. 4*d*., and I received for my precipitate 1*s*. 4*d*. after I had paid for reducing it to silver."—We have several times, in recent issues, alluded to this subject, and pointed out that the printing-out gelatine papers contain far less silver than does albumen paper. If the paper contains but little silver, then little must be expected from the wastes. Also it must be borne in mind that the silver, when recovered, is worth but little more than half what it was some years ago, while the cost of recovering is the same.

F. E. G. writes as follows: "At back of my premises I am erecting a two-storied building, comprising studio and dressing-rooms upstairs, and work-rooms, &c., downstairs. I shall be much obliged if you would advise me the best way to warm the place. Total length is fifty feet by eighteen feet wide. In kitchen fire adjoining I have to put a boiler for hot water for house bath. Could *this* be used for the purpose by circulating the water through studio, &c.?"—The kitchen fire would certainly not be adequate to heating the new building, unless, indeed, it were of abnormal size. The best and most economical method we can suggest is by hot-water pipes, after the manner that horticultural buildings are heated. The boiler should be outside or in the basement of the building. We should suggest that a local horticultural builder be consulted.

A CONSTANT READER (Londonderry) writes: "I am about to rebuild a studio. At present it is a wooden structure, and is lit from the north. In rebuilding, if I carried out the same aspect, it would only give me a length of about twenty-six feet; by lighting it from the east, I could have a length of about twenty-nine feet. Besides, this aspect is quite unobstructed, whereas the north is somewhat obstructed by the gable of another building. Would there be much difficulty in controlling the light if constructed from the east, and what arrangement is best for blinds? Would you also kindly say the best kind of glass for the roof?"—There will be a little more difficulty in working with the east light than with the north one, but not much; but that will be more than counterbalanced by the light being quite unobstructed, and the greater length of studio obtained. Pale green or dark blue will be suitable for the blinds, and ordinary glass for the roof.

MATT CARBON says: "I find much difficulty in preserving the beautiful matt surface obtained on carbon prints from collodionised matt opal temporary support during the final mounting stage, as I find a proportion of the matt surface disappears on the application of a moist sponge. Some professionals use a matt surface final support. Can you or any of the readers of the JOURNAL oblige me with information how to prepare it?"—If the matt surface, so much admired, disappears on the application of a moist sponge, that treatment should be avoided, and it is quite unnecessary in mounting carbon pictures. Most professionals who desire a matt surface develop by single transfer, and then squeegee the wet print on to ground glass, and allow it to dry on that; or, by double transfer, develop the print on ground glass, without collodionising it, or on a grained zinc plate. Either of these methods gives a more perfect matt surface than when the support is coated with collodion.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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COLOURING PHOTOGRAPHS.

The aspirations of the world towards the attainment of photographs in colour by chemical agency indicate with sufficient plainness that form, light, and shade, however perfectly rendered, are not the end-all in the delineation of Nature.

Precisely when or where colour was introduced as an appendage to drawing there exists no certain record, but it must have been very long ago. We have seen facsimiles of painted mural decorations in temples, unearthed by Dr. Le Plongeon and his intrepid wife near Merida in Yucatan, Central America, the originals of which were reasonably well drawn and coloured, and we have listened to discussions by skilful geographers as to the period of their being executed, this alleged period ranging from seven to ten thousand years since. In passing, we may remark that, from a comparison of certain phases of art work and even language (the Maya) with what is known to have existed in ancient Egypt, a strong argument in favour of the "fabled" Continent of Atlantis, over which the Atlantic Ocean now rolls, was deduced. But, be this as it may, it is evident that colour, in addition to drawing, has long been considered necessary to a true representation of nature.

We all admire a beautiful photograph in monochrome, and, in many instances, we say of such a picture, "It is just like a fine engraving;" but, when even "a fine engraving" is examined in juxtaposition with the painting of which it is a transcript, a well-marked difference is but too oft apparent.

It is not, however, our intention now to institute comparisons between painting and pictures in monochromé, but to take much lower ground, and tell the photographer that he might, with satisfaction to his *clientèle* and advantage to himself, issue more coloured work than he does. We are not now contending for elaborately painted photographs, although some of these, while costly, are singularly attractive, but for those which are only slightly tinted—sufficient to indicate that a person is not sallow and cadaverous, but has a face glowing with ruddy health, or to show that one's moustache or beard is not the black it purports to be, but is brown; and so on with the elements comprising one's dress.

All this may be achieved without, in the slightest degree, altering the likeness, so far as the drawing and light and shade are concerned. There are several ways now open to a photographer possessed of taste, but without having received an art education, for doing so. We will indicate some of them.

To begin with, there is that thousandth-and-one times patented method of applying opaque pigments in washes behind the photograph. This system has been considerably simplified and improved within the past few months by Klary, who has a good reputation in France and Algiers as an artist. His method obviates the previous rendering of the photograph translucent, as in all former methods, and we have seen some excellent effects produced by less than five minutes' work. The opacity of the pigment does not impair the transparence of the effect obtained, as the photograph itself intervenes between the spectator and the colouring matter. These pigments are now procurable commercially.

Bolder essays may be made by giving an albumen print a thin coating of size, by preference a solution of hard colourless gelatine, and then working upon it with transparent oil colours thinned with megilp. Opaque colours may be applied to the background and drapery, but it is not wise policy to do so to the face for fear of losing the likeness. Of course, an experienced painter may do what he chooses, using either opaque or transparent oils, but in these notes we are assuming the photographer to have only limited experience. The object of applying the coating of size will be evident. But for it, the oil would penetrate the paper and cause a stain.

When examining some matt Solio prints, it occurred to us that a surface of this nature would prove unusually excellent for the application of powder colours. Perhaps some of our readers may not be aware that colours of this class were used at one time in the colouring of Daguerreotypes and collodion positives. They are said to have been prepared by the admixture of a little gum arabic in solution with the various pigments preferred for the purpose, and, after drying, repulverising them to an impalpable powder and transferring them to small bottles. This, at any rate, was the way we prepared them when any special colour was required not easy to be readily obtained, for in these days hinted at the preparation of powder colour was in the hands of but few. Happily they can now be readily procured. A little of this on the point of a camel's-hair pencil was applied to the Daguerreotype with a swirling motion, and was fixed by breathing upon it. Beautiful effects were thus capable of being obtained.

We find that powdered colours, when applied to matt gelatine prints, form a ready means for imparting a seemingly elaborate colouring to a print, their application being made in a surprisingly brief period of time. When the superfluous powder has been dusted off, it would puzzle all but the

initiated to tell by what means the colour has been applied. If executed with judgment, the photograph has an appearance as if it had been carefully worked over by a skilful miniature painter, and, owing to the texture of the surface, the colours adhere with great tenacity. This is a method of tinting a print which we can very strongly recommend.

PHOTO-ENGRAVING.

At the last meeting of the Royal Photographic Society of Great Britain, Mr. Leon Warnerke demonstrated a method of photo-engraving with salts of silver. The method is based upon the property that Mr. Warnerke discovered and directed attention to more than a dozen years ago, namely, that a gelatino-bromide film, developed with the usual pyrogallic developer, was rendered quite insoluble in warm water where the light had fully acted, and proportionately less so where it had not. Although it was described so long ago, up to the present, so far as we are aware, no commercial advantage has been taken of the discovery.

The subject was pretty fully dealt with in an article a fortnight ago, when we considered it with reference to the proposed method that Mr. Howard Farmer described in his recent paper, *A Photographic Wedding*, and which a good many of our readers seem curious to hear something more about; for, if a gelatine relief could be produced in the camera with the brief exposure of a dry plate, thus "avoiding numerous intermediate operations," the method would possess considerable commercial value. As we pointed out in the article referred to, the condition which Mr. Farmer claims can be brought about by a double operation—namely, treating the developed negative with bichromate of potash—already exists in a single one, as our older readers are fully aware, and that the bichromate treatment is useless, as Mr. Warnerke demonstrated the other night. Many who witnessed the working of the process for the first time, and were not previously conversant with the principle involved, naturally questioned the feasibility of producing a photogravure plate of the "Lord Mayor's Show" by the method referred to in Mr. Farmer's recent paper.

Let us see what are the essentials in producing a photogravure plate by the etching method. We require an image in varying thicknesses of insoluble gelatine to act as a resist to the etching fluid, and this Mr. Farmer proposes to obtain direct in the camera, and, necessarily, on a metal plate; and the question is, How? Mr. Warnerke's method of photo-engraving, as demonstrated by him the other night, for a typographic block—though the operations are the same in the case of an intaglio plate—is this: A negative of the subject is taken through a lined screen, and from that a print on paper coated with gelatino-bromide of silver is made, and developed with the usual pyro-ammonia developer. As soon as the image is developed, the print is practically analogous to an exposed, but undeveloped, carbon picture. Those parts that have been acted upon by light have become insoluble in proportion as it has reached them.

A little consideration will show that, as in a carbon print, there is a soluble layer of gelatine in proportion as it has been protected from light by the various gradations of the negative intervening between the paper and the outer surface of the gelatinous coating. If the print were immersed in warm water, the image would, as with a carbon print, float away in detached pieces; consequently the second development, as in carbon printing, must take place from the back. The pyro-developed print is therefore squeegeed on to the metal plate; then, when it is put into warm water, the paper comes away, and, by continuing the action of the water, an image in varying thicknesses of insoluble gelatine is obtained suitable for the etching operation. If a photogravure-intaglio plate is required—and it is that which is referred to the paper, *A Photographic Wedding*—Mr. Warnerke uses a transparency, instead of a negative, to print the relief from, and mounts the resulting negative on a grained copper plate for the second development.

Seeing that to obtain the relief, whether it be by the silver or the bichromated gelatine method, the development must be conducted from the opposite side to that which has been exposed to light, curiosity naturally exists as to how Mr. Farmer is going to obtain his relief with a single operation, and without "intermediate operations." To do so, it would seem that the bromide emulsion would have to be coated direct on the copper plate—the result of doing that needs no comment from us—and, as the hot-water development has to be conducted on the reverse side to that which has received the exposure, the exposure must be made through the metal plate. Perhaps, however, Mr. Farmer has some way of meeting this contingency?

Mr. Warnerke's process is really a practical one, and one by which most excellent results may be obtained. But it is quite open to question if this method of making the relief really offers any practical advantages over the methods that are now in general use; while it has the disadvantage of involving an extra operation, that of first having to develop an image in silver, and afterwards develop it as a carbon picture is developed. The only advantages we can recognise in this very ingenious process is that the exposure to light with the bromide film is less than in the case of any other process that is in general use. But this, after all, is of minor importance in processes where gelatine resists are employed.

There is no question that, if printing matrices could be made with fewer operations than are usually necessary, it would be an advantage to many. We may recur to that subject in a future article.

THE CONVERSION OF PLATINUM RESIDUES.

Now that platinum salts seem likely to secure a larger share of favour for toning purposes, it may not be amiss to consider the simplest means of recovering the metal from the residues that accrue from platinotype printing. These are, of course, not so heavy as in the case of silver printing, especially when albumen paper is employed, nor, unless the work is on a very considerable scale, are they worth sending to the refiner; but in a rough-and-ready way even the smallest worker who employs both platinotype and silver paper may utilise the residues from the one for toning the other.

The form in which the waste is obtained will be chiefly cuttings of paper, spoilt prints, and the deposit that forms in the developing bath; but, for all practical purposes, these may be regarded as metallic platinum, the paper being, of course, incinerated before further treatment. A certain amount of difficulty will, of course, exist in estimating the precise metallic value of the residues in the latter case, though, if the ignition of the paper be carefully and thoroughly performed, so as to destroy as much as possible of the organic element, there will not be much trouble in preparing a tolerably trustworthy

solution for ordinary toning purposes. The sediment from the developing solution, if carefully collected and freed from iron, may be taken as practically pure platinum.

For toning purposes, the platinum is now universally employed in the state of chloro-platinite of potassium or sodium, a combination of platinous chloride with chloride of the other metal. In order to form this salt, the metal is first converted into platinic chloride by solution in aqua regia; it may then be precipitated in the form of chloro-platinate by treatment with chloride of potassium or sodium, and subsequently reduced, by one or other of the methods described by Mr. M. Carey Lea a week or two back, to chloro-platinite. Or the platinic chloride may be reduced to the platinous condition by the careful application of heat, and, after solution in hydrochloric acid, converted into the double salt by the addition of the alkaline chloride, the chloro-platinite then crystallising out of the solution.

The latter is the method we propose to adopt, though, for our present purposes, we shall not go to the trouble of crystallisation, as with ordinary care a sufficiently definite solution for toning purposes may be found in the manner we shall direct. If an absolutely pure salt be required, then crystallisation must be resorted to; but, for all ordinary purposes, this is scarcely necessary.

Let us suppose the residues to have been collected in the form of metal; if in the shape of ash, it will, of course, be desirable to form an estimate of the metallic value. One part of metallic platinum may be roughly calculated to form two parts of chloro-platinite of potassium, and to leave a slight margin for waste in process of conversion; and, reckoning on this basis, it will be easy to make up a final solution containing approximately one grain of the salt to each drachm of water.

We are assuming that the operations are on a small scale, as in the majority of cases they will be; but, for the sake of example, we will say that half a drachm of platinum is to be treated. For this quantity a good-sized test tube, one capable of holding two or three ounces, will suffice. The metal, in a finely powdered condition, having been introduced, is carefully washed down with two drachms of nitric acid, sp. gr. 1·42, and one drachm of hydrochloric, sp. gr. 1·16. Heat is then to be applied until vigorous action takes place, and the temperature must be kept up to the point necessary to ensure the steady progress of solution. As the action of the acid appears to flag, more hydrochloric acid may be added in small quantities at a time, but no further addition of nitric need be made so long as brown nitrous fumes are given off. The actual quantities of acid employed, within reason, are immaterial, as any excess is driven off in the subsequent operations. The stronger the acids and the higher the temperature, however, the more rapid will be the solution.

When the whole of the metal is dissolved, the solution is to be evaporated to dryness. In the case of ash from paper clippings, it will be difficult to decide when the whole of the metal has gone into solution, owing to the presence of some insoluble matter, but this need not matter if the action be continued until no further change appears to take place; any insoluble matter remaining will be destroyed in the after-process, or will be removed by filtration from the final solution. For the purpose of evaporation, it will expedite matters if the liquid is transferred to a small porcelain basin or capsule, but there will be less chance of loss from waste if the process be carried through in the original test tube, although the time occupied will be longer.

If the evaporation be conducted in a capsule or basin, the vessel should be first of all well bedded in a sand bath or shallow iron dish containing sand, to equalise the temperature, and the basin must be of sufficient capacity to avoid loss from spurting or boiling over. In view of the value of the contents and the liability of loss in this manner, it is, in many respects, preferable to complete the operation in the test tube itself, and this may be plunged into the sand bath, at least during the latter portion of the evaporation. The sand bath may be placed on a gas stove or an ordinary fire.

When the whole of the water has been driven off, the residue will be of a reddish yellow colour, and will consist of platinic chloride. To convert this into platinous chloride, it is necessary to submit it for a considerable time to a temperature of at least 200° Cent., until it becomes insoluble in water. This forms the only difficult or uncertain part of the process, as it is impossible to tell, without actual trial, when the operation is complete, besides which it is not easy to keep up a uniform heat. It is not essential, however, that the temperature be perfectly regular, nor that it be closely approximated to the degree mentioned. Anything between 200° or 300° will be perfectly safe, and this we have found no difficulty in keeping up for a practically indefinite period on an ordinary cinder or coke fire; probably one of the better class of gas stoves would be even more uniform and reliable.

This portion of the process is carried on in the same vessel as the evaporation; indeed, it is not advisable to change this from beginning to end. As the heating is continued, the colour of the product becomes gradually darker, until it acquires a greenish-black colour, but it must not be assumed that this denotes the completion of the process. As already stated, there is no means of ascertaining when the conversion is complete except by practically testing, for which purpose a few drops of water must be added to the black mass, when, if any unconverted platinic chloride remain, it will be coloured reddish yellow. If such be the case, it only remains to dry off the moisture, and continue the heat until, on repeating the test, no further colour is imparted to the added water.

When this stage is reached, the residue consists of platinous chloride, which is insoluble in water, but soluble in hydrochloric acid. To bring it to the condition in which it is finally required, we therefore add, cautiously, hydrochloric acid, of the same strength as that originally employed, until, on gently heating, the black mass is just dissolved, after which chloride of potassium, or of sodium, is added in about equal quantity to the platinum dissolved.

If it be intended to crystallise the double salt, more of the alkaline chloride may be added, but for our purpose this is entirely unnecessary, and it only remains to neutralise the excess of hydrochloric acid by means of carbonate of soda which will add a certain proportion of chloride of sodium to the solution, one of the ingredients required in toning. The solution keeps better in the acid condition, but free hydrochloric acid would cause bleaching or reduction of the prints during toning, hence it is necessary to neutralise that acid, and subsequently add a small trace of some feebler acid, such as citric acid. If the platinic chloride be imperfectly converted, a similar bleaching action will occur in toning; but, in this case, neutralisation fails to prevent or remove it. To those who have small quantities of residues to deal with this will prove a useful method of conversion.

Photography and Holiday Lectures.—The "Christmas Lectures to Young People," arranged by the Royal Geographical Society, will embrace one devoted to geographical pictures, with special reference to amateur photography. At the Royal Institution, the Friday evening meetings will commence on January 18, Professor Dewar being the lecturer, and dealing with the interesting topic we recently referred to in connexion with his name, *Phosphorescence and Photographic Action at the Temperature of Boiling Liquid Air.*

Frost Pictures and Snow Crystals.—The season has arrived when enterprising and observant photographers may obtain beautiful effects for ornament, decoration, or even for such subjects as Christmas cards, from a simple window pane on which the condensed moisture has frozen in the familiar way in beautiful and graceful forms, which are simply water crystals. The frozen mud on the footpaths has been deemed interesting enough for the scientific papers to publish photographs of. The well-known pictures of ice crystals, however, as found in some kinds of snow flakes, are said to be less beautifully regular than the producer of these pictures would have us believe, and a writer in *La Nature* refers to the grievous disappointment felt by many at the discrepancy between Nature's handiwork and the artistic fancy as exhibited in the difference between such ice crystals as really seen and those that embellish scientific works. Dr. Trouessart describes in the pages of that journal how to obtain beautiful crystalline forms as a substitute for snow crystals. His plan is simply to allow a drop of ink to dry on a slip of glass, and then to observe it through a microscope with not too high a power. He illustrates his remarks by giving a rival picture to the famous water crystal fancies, and very beautiful it appears; but as the forms are based on the cube, and not the hexagon, as in water, we cannot recommend our readers to enlarge such slides of crystals and pass them off as snow crystals.

New Telescopes.—Whatever may be its truth or otherwise, a paragraph is going the rounds of the papers to the effect that Sir Howard Grubb is engaged in arranging for the construction of a new telescope—a reflector—which is to be nearly three and a half yards in diameter. It is stated that the huge instrument will weigh one hundred tons. It is further said that, "in order to eliminate the friction of motion," the mirror is to be mounted in a tank of water, sixty feet in diameter and one hundred feet high! Passing from problematical to accomplished facts, attention may be drawn to an article that appears in the two consecutive numbers of *Engineering* the end of last month. The instrument, made by Messrs. Cooke & Sons, is described in a series of twenty-nine plates, giving fully detailed drawings. The object-glass is of Mr. Taylor's three-lens form, made of such selected glasses of the new series as are permanent in the air, and is perfectly achromatic. As the latter expression is meant to be taken literally, a further reference to its construction may be asked for. The first lens is double convex, the outer curve being very flat, and is of baryta light flint. The inner of the triplet is a deep double concave, and made of boro-silicate glass. The third lens, plano-convex, with the plane side outwards, is of light silicate crown. The curves of the inner lens can be so arranged as to almost exactly compensate the dispersion of the other two and without any extreme focal length. The second and third lenses are slightly separated, so as to facilitate the correction for spherical aberration. It is stated that, when this correction is properly made, spherical aberration for all colours of the spectrum is entirely eliminated. It will be obvious that in this case the instrument must likewise be corrected for photographic errors, and the statement is made that such absence of error has been found by astronomers, who have tested the new instrument, both visually and photographically. In stellar work, the absence of residual colour caused the image given to be like one from a reflector.

The Living Picture Case and Copyright.—In delivering the judgment of the House of Lords against the plaintiff, Herr Hanfstaengl, in the action he brought against the *Daily Graphic* for infringing his copyright by publishing illustrations of "living pictures," copied from the plaintiff's copyright works, the Lord Chancellor, on Monday, said that the plaintiff's counsel had felt it difficult to say that the alleged infringement was a copy or reproduction or multiplication of the plaintiff's paintings, but they relied on the words "or of the design," and he thought the plaintiff could not succeed unless he showed that the defendants had copied the design of some or one of his paintings. It was obvious that the plaintiff could not claim to have a monopoly of every treatment of such common subjects as love and courtship or charity. The paintings of which he alleges his copyright to have been infringed were all of this class, and it would be impossible to give the word "design" as used in the statute so wide a meaning as to confer such a right as this. What was covered by that word must depend in each case upon the nature of the painting. It was not accurate to say that the living pictures were copies of the paintings. It is admitted that the faces, at all events, were different, and it was not shown that the countenances of the living persons who figured upon the stage bore any close resemblance to those depicted by the artist. In some cases this difference would be all-important. The skill of the artist might have been mainly devoted to this part of the picture, and the faces depicted might be of the very essence of the design. The other details might be so subordinate to these that even if a drawing showed some resemblance in other respects, yet, if the faces were different, no one would dream of saying that one was a copy or reproduction of the other. On the other hand, there might be cases where the grouping of the figures and their accessories might be more important in comparison, and a change in the countenances represented might leave the design of the painting substantially the same. It must always be a question of fact whether what was complained of as an infringement was a copy of the design. It was impossible to lay down any hard-and-fast rule. He was far from saying that what was called a living picture might not be so arranged to represent an existing painting that a photograph or drawing of the living picture would be a copy of the design of that painting. All he said was that it must depend upon the character of the picture, and what was justly to be regarded as its design. It was admitted that the sketch most favourable to the plaintiff's case was that representing *Courtship*, and there was no doubt a resemblance between the sketch and the photograph from the painting. But the faces of the man and the woman were different, the mode in which the woman's hair was arranged was different, the dress, especially in the case of the woman, was different, the pose was different, the attitudes were different, the background was different, and, in the case of the sketch, the foreground was wanting. In the artist's design all these things played a part, and, though he did not say that a variation in one or even more of these respects would prevent the sketch being a copy of the design, yet, comparing the two, and considering the design of the painting as a whole, he could not avoid the conclusion that the sketch was not a copy of the painting or of its design, and therefore there had been no infringement. It was difficult, if not impossible, to put into words all the reasons which led to the conclusion arrived at on such a question as that now before them. He had tried to indicate some of those which had led him to his conclusion, but it depended really on the effect produced upon the mind by a study of the picture and of that which was alleged to be a copy of it, or, at least, of its design. On the grounds which he had indicated, he thought the judgment of the Court of Appeal should be affirmed, and the appeal dismissed with costs.

FURTHER EXPERIENCE IN PLATINUM TONING.

Another month's experience with platinum has served to more than confirm the opinion I have already expressed, that it is a more generally reliable toning agent for gelatino-chloride papers than gold, although the latter has certainly the advantage of being more thoroughly understood. Such, at least, may be said, without any question, when albumenised paper is concerned, but I scarcely think it is true when we turn to gelatine; but, whether it is the toning agent or the paper itself that causes the uncertainty, person-

ally I find that the platinum salt is more to be relied on for uniformity as well as quality of result.

At the same time I am willing to admit—for I know such to be the case—that there are many who find fault with platinum, though, I submit, the grounds of objection are not very solid ones. In the first place, the tones obtained with platinum alone are said to be different from those given by gold; and, again, complaint is made of the slowness of action of the platinum bath.

With regard to the question of tone, it is true that, in the ordinary way of use, take for instance the formula issued by the Eastman Company, it is difficult to secure anything satisfactory except within a pretty wide range of colour from red to brown—tones, be it said, that a few years ago would have given every satisfaction. But of late years, since the popular taste has veered round in the direction of "platinum" tones, these brown colours have lost favour, although, curiously enough, the votaries of platinotype have gone out of their way to attempt, even at the expense of permanency, to secure sepia tones.

My own recollection of the results of platinum toning of silver paper many years back is that black tones alone were obtainable, but this was in the days of dense negatives, highly salted paper, and strong sensitising baths, and deep printing. Then, with some substance in the image, it would stand a good deal of reducing and bleaching at the hands of the bichloride of platinum then used, and the consequent deposition of a fair amount of the latter metal. But, with the comparatively thin images of to-day, the result is that, if too much of the organic silver is converted into platinum, there is an entire loss of brilliancy and richness, and nothing is left but a feeble grey image. Hence the limitation of the use of platinum to the production of brown tones.

In my earlier experiments with chloro-platinite of potash simply acidified, I failed entirely in obtaining anything of a satisfactory nature even in brown tones; on trying the Eastman formula with chloride of sodium added the result was better, and, indeed, for merely brown tones, ranging from almost red, through sepia and chocolate, to brown black, this does all that can be required; but it will not give anything approaching purple—so called—or the blacker tones obtainable with gold. It was only when, by chance, I passed into an experimental platinum bath some prints that had been treated with solution of salt previous to toning that I secured anything approaching to what we are accustomed to call "purple" tones. This result I, of course, attributed to the modified toning solution, the modification consisting of the substitution of oxalic acid for citric and tartaric which I had previously employed; but, on using the same bath with a fresh lot of prints which had not had the preliminary treatment with salt, although salt was present in the toning solution itself, the results were precisely as of yore, and no approach to purple was obtainable.

Why the preliminary use of salt should exercise a different action to that produced when it is present in the bath itself it is difficult to say, but such is undoubtedly the case, and therein seems to be the secret of securing tones tending in the direction of blue rather than brown. My article in the just-published ALMANAC was written when I had arrived at this stage of my experiments in platinum toning, and for those who desire purple tones, warm or cold, or a near approach to black, with the least possible trouble, I cannot recommend a better formula than the one there given.

Since that article was written I have described in these columns a further modification of the process by which even better tones may be obtained—tones, in fact, which it is impossible to distinguish from those produced by gold and phosphate used under the best conditions; but it is at the expense of a little more trouble, or, at least, of a little longer time. This last modification consists in the substitution of a bromide salt for the chloride used in the preliminary bath, and this, while it very materially changes the character of the tones obtained, also considerably slows the toning action.

When I last wrote on this subject a month ago, I was in hopes that, by using the platinum bath in a more concentrated form, and perhaps by combining the bromide with it, instead of using it separately, the speed of toning might be increased, but on trial this does not prove to be the case, at least to the extent that might have been expected. I was then using one grain of platinum salt to ten ounces of water, and a rather strong solution of bromide of potassium for the preliminary soaking. I have since tried the latter salt in the toning bath itself, but, while it does not give such good tones, it exercises a stronger retarding action on the toning process. I find that, if the strength of the preliminary bath be reduced to two or three grains of bromide to the ounce of water, the prints being well washed previous to immersion, and its action allowed to continue until the colour of the image has become distinctly yellow, all the beneficial results, as regards colour, are obtained with a minimum retarding effect.

At the same time the strength of the platinum bath may be increased to one grain of chloro-platinite and five grains of oxalic acid to five ounces of water, but even under these circumstances the toning process averages about half an hour in duration. This is, however, not very much out of the way; I have found the gold toning bath frequently take longer than that and not give a decent result at the finish, whereas the platinum always comes out well if it does take its time.

In conclusion, I can only repeat what I have previously said, that there seems to be not the least tendency with platinum to either of the great faults of the alkaline gold bath, namely, pink and yellow discolouration, and, from rough tests applied to the toned image, the prints promise to be more permanent. In making this remark I am not referring to any difference between platinum and gold in the image itself, but rather to the capability of the whites to withstand yellowing.

W. B. BOLTON.

JOTTINGS.

To be blackballed by the members of the principal photographic Society in the world on the eve of one's renunciation of amateurism for professionalism is an experience which nobody will envy Mr. Horsley Hinton. After mature consideration of all the published circumstances of the case, I have come to the conclusion that the blackballers made no mistake in rejecting him, for they did just exactly what he wanted them to do. He tells us himself, in his letter of November 19 (see page 751), that he regards his defeat as an "honour and distinction;" *ergo*, if he had been elected, it would *not* have been an honour and distinction. Consequently, do not he and the Society owe the blackballers their best thanks for saving him from *dis*honour and obloquy? Next, as Mr. Hinton has got what he probably covets, viz., "honour and distinction," how can his rejection harm the Society—or him? On his own showing, this could only have happened by his success at the ballot. Then, he tells us that he is "not socially obnoxious," and that he has "merit," and "good character." What a nice young man for a small tea party! Such a paragon of virtue and talent is too good for this world, let alone for associating with mere photographers.

Mr. H. P. Robinson takes up the cudgels on behalf of Mr. Hinton in a contemporary, and says many amusing things at the expense of the blackballers and the Society. His defence of Mr. Hinton is a piece of chivalry which redounds to the credit of an old warrior, but his tilt at the Society is only comparable to the celebrated onslaught by Don Quixote on a harmless, unoffending windmill. Tried by any or every test that may be applied to it, the Society has improved and advanced since Mr. Robinson's defection three years ago. Many people cherish the fond delusion that the world cannot get on without them, and are angry when they find that it can; hence Mr. Robinson's present grudge against the Royal Photographic Society. It admits of no other explanation. As to his lament that "the man on the beach or the touting portraitist may become a member if he can afford it," my acquaintance with these humble brethren is such as to persuade me that they would be far more desirable as members of the Royal or any other photographic society than many people of higher photographic pretensions. Your beachman or touting portraitist usually knows something about practical photography, whereas, to a comparative ignorance thereof, a great many of the "curled darlings" of the New Movement add such a veneer of priggishness, affectation, and snobbishness as to totally unfit them

for any society but their own. The mushroom growth of sham and shoddy "Art," which a microscopical knot of superior young gentlemen are trying to graft on to the stem of modern photography, is the cause of a display of conceited attitudinisation and vanity which is only tolerable because it is making the world laugh!

Death has been striking at the photographic ranks with singular impartiality during the last two or three weeks. I knew Alexander Ayton and R. L. Kidd well. Both had done good work in photography; both, had they lived, were laudably ambitious to do more; both would have done it, but both have gone from us young. There is always, to me, something extremely pathetic in the removal from the scene of a man in his prime, with half his mission or destiny unfulfilled. Richard Keene, on the other hand, had virtually lived his life; yet he too will be missed by many who admired him for his rare photographic skill and unsurpassed personal geniality. What an admirable President of the Convention he would have made!

My best congratulations to the Photographers' Copyright Union, which is setting about its task in a straightforward, businesslike manner, and deserves to have a successful career. With a reserve fund of over 300*l.*, I trust it will not be long ere it will find an opportunity of fighting and winning a good test action or two, so that the law of copyright as it affects photographers will be backed up by something in the nature of a clear precedent case in the High Court. In so far as I have studied the matter, this is what the Union and professional photographers need most of all. The illustrated papers and other pirates would not then hold the obscure little photographers' rights in such contempt as they appear to do at present. The Union, unlike so many other institutions that we have in photography, is being managed so well in the interests of the professional man, that I feel quite a novel delight in recommending my professional readers to join it. Now is a good time, for a new year opens in a few days. The subscription is 10*s.* 6*d.* a year, and the Hon. Secretary is Mr. H. Gower, Botolph House, Eastcheap, E.C.

I am glad to hear that the Benevolent Association is not to be dissolved; there is, alas! only too much need of such an institution, as Mr. Snowden Ward's letter of last week indicates. I don't know by what scheme the Committee hope to increase the usefulness of the Association; but, whatever it is, I am sure the press and the friends of the Benevolent will support it if it is likely to achieve the object specified. It was stated in these pages a few weeks ago that the Council of the Royal Photographic Society was to be asked to take over the administration of the Association. This might possibly help the funds, as the Society has excellent means for reaching the ears and purse strings of a great many who could afford a little help to the fund. But, ah! how can the 4000 professional photographers in the country, their thousands of assistants, and the many thousands of others engaged in the allied arts and industries, be induced to take a little more substantial interest in the affairs of the Association? There is only one thing that will really kill the Benevolent, and that is the apathy of those for whose sake it exists.

The National Association of Professional Photographers—Phœbus! what a name—has actually done something at last! It has got into hot water with Messrs. Marion & Co. and Mr. Elliott. I have followed the entire career of this remarkable body with close interest, and so far have failed to discover that it has made any serious attempt to redeem the great promises of its inception. Socially, as a means of occasionally uniting a few professionals from various parts of the country, it has perhaps secured some success; as an authoritative, legislative, representative institution, its record is virtually a blank. Like the House of Lords, it

> "Does nothing in particular,
> And does it very well."

The protection of photographers' copyright interests was, if I remember aright, one of the planks in its platform; but the Union has annexed this, so what is there left for the poor N.A.P.P. to do? Lots, of course, if it can do it. There's the cutting of prices to be stopped; dealers' discounts to be regulated; the amateur to be taxed or assassinated in his thousands; purveyors of defective card mounts to be boiled to death in strong hypo solution; and a law to be passed rendering it compulsory on every man, woman, and child of us to be photographed by a member of the N.A.P.P. twice a year, the penalty for neglect being six weeks' "hard" in a dark room! Some of us would rather pay the penalty—but let that pass. With such a programme before it, there is no reason why the N.A.P.P. should not live for years; it must never do anything else, or it will die.

"Trumpet-blowing" in these pages is never indulged in; but I trust I may be allowed to congratulate all concerned in the preparation of the 1895 ALMANAC on the appearance of that little pocket-book. It is bigger, and, of course, better than ever. Mr. Drage last week happily calls it "A Big Yellow Book;" unlike the other "Yellow Book" that comes from Vigo-street way, it will not give you the nightmare. May I live to see it develop into a rival in size of Kelly's *Directory!* A contemporary "critic" says the ALMANAC is welcome on account of its advertisements. There are some publications to which the designation could not possibly apply, either with the advertisements or without.

And now, my friends, a merry Christmas to you all; and may any difference of opinion that exists between myself and many of those I name in this column never interfere with our impersonal friendship! May you and I during 1895 be in accord in rejecting all that is false and bad in photography; may we unite in upholding the true and the good!

COSMOS.

A MODIFIED EMULSION FOR NEGATIVES.

THESE lines are written with the special view of assisting and simplifying the work of those who, like the photo-lithographer and process workers generally, still have recourse to the old methods of negative production by means of collodion and silver bath. With the results of work so produced I have no word of complaint to make. As an old collodion worker, I am still old-fashioned enough to believe that equally fine negatives can be produced by that process as are possible by the modern gelatine dry plates. But it cannot be denied that as a process the wet-plate method is attended by such a formidable array of difficulties that the operator is kept in a constant state of expectation and dread of the bath going wrong, and it takes no small skill to keep the chemicals and bath in good working order. In spite of every precaution and care, when the working materials have been left, after a day's work, in perfect order—bath filtered, collodion decanted, plates cleaned and albumenised—on proceeding next morning with the day's routine of work, the operator finds a sudden development of fog, streaks, comets, pinholes, and other abominations of which the modern dry-plate worker has no conception, and which will defy for a time all the remedies which experience can apply to cure them. If conquered for a while, it is only to reappear in some other and aggravated form in a few hours or days.

There are, however, qualities inherent in collodion negatives which are of special value for certain commercial purposes, and which are not present in gelatine, and which render their production of great importance and value. Any method by which the whole or greater part of the wet-plate man's trouble can be done away with, and that without sacrificing any of these special qualities, must therefore be of peculiar interest and usefulness. I do not propose to discuss the probability or possibility of substituting dry gelatine plates for collodion. If only as a matter of economy, the latter will be difficult to displace from the process worker's laboratory, where constant changes of size in plates required, from quarter-plate to twenty-four inches, would, with the dry plate, require a large outlay to keep up stock, and a constant accumulation of useless glass. With collodion, however, the glass is readily cleaned for use again, and the preparation of a plate of any size, from coating to final drying, is only a question of a few minutes.

It has often been a matter of surprise to me that the use of collodion-emulsion never attained that importance in general studio work which it undoubtedly deserves. This may be accounted for in

part by the fact that the endeavour of experimentalists was directed to its use as a dry process, and comparatively few ever attempted to use it as a wet process without a bath; and its capabilities in this direction will be a surprise to many. Negatives may be produced with great ease and certainty, quite equal to any obtained by the bath process, even in its best of working condition, whilst an emulsion, when properly made, will retain its good working qualities to the last drop, and is in no way liable to the numerous diseases which assail the silver bath. The clear, sparkling brilliancy of a good collodion-emulsion negative would make the photo-mechanical operator's mouth water to look at. In rapidity it is quite equal to wet plate with bath, and can easily be rendered almost as rapid as gelatine when light is bad or time of importance. And again, in the production of copies from drawings, maps, engravings, &c., which may either have become discoloured by age or be coloured by the artist, difficulties thus presented to the ordinary wet-plate process disappear with emulsion, from the facility with which each plate may be rendered colour-sensitive by the use of the numerous sensitisers at command. The whole operations of negative production are thus rendered of the simplest and easiest character, and can be readily mastered by any one who can coat a plate with collodion.

For years past the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY have contained abundance of instruction in the most minute details of collodion-emulsion making, and at this date it is difficult to write anything on the subject that is absolutely new. The following method, however, the result of many years' constant practice, possesses points of difference to the hitherto published methods, and is specially adapted to reproduction work, on account of the clean and uniform results which are so readily attainable by its use. As I wish to make the whole process simple to those who have not hitherto practised with collodion emulsions, I may, perhaps, be pardoned if I give details which may be familiar to older workers.

First, as to the nature and quality of the materials employed. The most important of these is the pyroxyline; this must be of good quality, or failure will inevitably result. It must dissolve readily, without sediment in ether-alcohol, and flow smoothly over the plate. A cotton which dissolves with difficulty, giving, at six grains to the ounce, a thick ropy solution, renders even coating of the plate an impossibility. Fortunately, there are plenty of good soluble samples to be obtained, and, if care be taken in the purchase, no difficulty will occur in this direction. For the solvents, methylated sulphuric ether, sp. gr. 725, and good commercial methylated alcohol, answer perfectly; nor does the recent addition of mineral naphtha to the alcohol affect it disadvantageously. Let both be of good quality, however, and the more highly rectified the better. As to the bromide, I attach considerable importance to the use of cadmium, or zinc, in preference to any of the alkaline bromides, on account of their ready solubility in alcohol of high specific gravity. In compounding the emulsion, every care should be taken to employ as little water as possible, as each such addition, by lowering the solvent power of the ether and alcohol, increases the difficulty of obtaining even coating of the plate, more especially when large plates are being used.

I will suppose you desire to make twenty ounces of emulsion. Proceed as follows: In a bottle, of at least thirty ounces capacity, place—

Pyroxyline	120 grains,
Ether (methylated)	10 ounces,

and shake till dissolved. In a boiling flask put —

Nitrate of silver	400 grains.
Water	60 to 80 drops.

Put the flask containing the silver into a saucepan of water, and bring it to boiling point, with constant agitation. After a while the whole of the silver will be dissolved. When this takes place, add one ounce of alcohol. It is probable that nearly the whole of the silver will be precipitated, but replace in the hot water, and it will soon again dissolve. Add in this way more alcohol, until you have added ten ounces; then, making sure there is no undissolved silver left at the bottom of the bottle, add this, whilst still hot, a little at a time to the dissolved pyroxyline. Again the silver will be partly precipitated, but this time in contact with the pyroxyline, and in a fine state of division, so will cause no trouble in emulsifying.

Now weigh out—

Cadmium bromide	300 grains,

and add to the silvered collodion, and immediately commence to shake vigorously until the whole is dissolved. Use no acid of any kind. Of course, the emulsion is now sensitive to light, but will not attain its full sensitiveness for some hours, or it might be a few days. Much depends upon whether the silver was neutral and the ether and cotton were free from acid. Good negatives may be taken with it in a few hours after mixing, but it is not yet in the condition I am recommending in this article. A process of ripening goes on for some time, and, as the emulsion contains a large excess of free silver nitrate without restraining acid, this stage is soon passed, and on trying a plate with it nothing but dense black fog can be obtained, and the tyro would judge the whole lot spoiled. But this is just what is wanted in this method of preparation, and when it is attained the emulsion is ready for the final operation.

Take—

Ammonium bichromate	20 grains.
Water	6 to 8 drops.

Put in a test tube, and dissolve by heat. Add this whilst hot, to prevent crystallising, to the fogged emulsion. A dense crimson precipitate of silver bichrome is at once formed, and the emulsion looks of a brick colour. Now add, with constant shaking, more cadmium bromide, a little at a time and with constant shaking, until the whole of the colour disappears and the silver bichrome is converted into silver bromide. The emulsion is now complete, and possesses several peculiar properties. It is no longer sensitive to light on account of the presence of cadmium bichrome in it, and no precautions are needed to keep it from the light. A long exposure to strong daylight would fog it, but on replacing in the dark room for half an hour it recovers all its good qualities.

The comfort of being able to coat the plate in a good strong light without any fear of fog is undeniable. As I said at the commencement, this emulsion is intended to be used wet, just as ordinary collodion, but without a silver bath. The details of operation, therefore, as to preparation of glass and coating plate differ in no respect from ordinary wet-plate practice. Allow the collodion to set well, then immerse in a dish of clean water, and allow to remain until the ether and alcohol are washed out, and by that time the by-products of cadmium nitrate and bichrome will also dissolve out, and a final rinse with clean water from the tap removes the last trace, and the plate recovers its full sensitiveness, with perfect freedom from fog and other defects common to wet collodion. Exposure is about the same as for wet collodion, but a wide margin is allowable, for it seems almost impossible to fog the shadows, and in development over-exposure is easily remedied.

For development, any of the developers used in the gelatine process may be employed, taking care to add a grain or two more bromide to the ounce. Ferrous oxalate or hydroquinone are, however, the most successful in my hands, about half the strength usually recommended. If for process-work negatives, the addition of one drop per ounce of developer of tincture of iodine, made by dissolving ten grains of iodine in one ounce of alcohol, will assist to keep perfectly clear shadows and get great density. If sufficient intensity is not attained at once, wash off the developer, and proceed to redevelop with the following:—

Nitrate of silver	60 grains.
Water	4 ounces.
Soda sulphite until the precipitated silver sulphite is redissolved, then add citric acid	10 grains.

Of this take one drachm and make up with water to one ounce, add a grain or two of hydroquinone or pyro, and intensity will be obtained without any fear of veiling the shadows; or the ordinary lead or mercury methods may be employed with advantage, if preferred. Silver bromide is not so amenable to redevelopment with ordinary silver nitrate and acid pyro; but, if that method of intensifying is desired, a preliminary wash of potassium iodide, ten grains to the ounce, with just enough iodine to make it of a sherry colour, will convert the bromide into iodide, and then, after washing, the pyro and silver method may be used with perfect results.

The emulsion made by the preceding method will keep indefinitely I have some over twelve months old in perfect order, and equally as sensitive as when first made. It is a curious fact that the addition of the bichromate after the fogging stage has been reached seems to make a cleaner and more sensitive form of emulsion than if added at any time before. Indeed, if time were an object, I would prefer to hasten fog by the addition of a grain or two of potassium hydrate, or even by exposing the whole batch to light, and then recovering by the bichromate method. But the best method is undoubtedly to let it attain the full stage spontaneously, as described.

In dark weather or bad light the sensitiveness is enormously increased by flowing over the plate, after washing and before exposure, a solution containing two grains of potassium or sodium hydrate to the ounce of water. This acts as a powerful sensitiser, and makes

the plate almost as rapid as an ordinary gelatine plate. Should pyro or ferrous oxalate be used as a developer, however, this should be washed off previous to development. To sensitise for colour, a bath of erythrosine or chlorophyll previous to exposure, and the use of a suitable screen will be found of great service. EDWIN BANKS.

ANALYTICAL CHEMISTRY FOR PHOTOGRAPHERS.

[North Middlesex Photographic Society.]

IN introducing the subject of chemical analysis to you this evening, I think no apology is needed, for the subject is one which should have interest for all who practise photography, be it either for pleasure or profit. It is needless for me to dwell upon the many advantages possessed by one who has the power of testing the materials with which his work is carried out, or constructed; this power has been to a great extent looked upon as privileged only to those who possess a thorough knowledge of chemistry. This is an error which I hope to dispel, and show you how one without previous knowledge of chemistry, but possessed of average intelligence and patience, may qualify himself for this subject. It is only my intention, this evening, to act, as it were, as a preface to the subject, and not to go into many of the minor details with which this subject abounds. My aim is not for this paper to take the place of the many excellent text-books on this subject, but just to arouse your interest in this branch of photography, which is one of the key-notes for those who desire to experiment and dip into the future of photographic manipulations.

Now a word as regards apparatus. Most of the articles required are in every-day use, and the few extras required do not need the proverbial long pocket to become possessed of the same. The following apparatus will suffice for most work: Test-tube stand, test-tube brush, twelve test tubes $5 \times \frac{1}{2}$, spirit lamp or Bunsen burner, wash bottle, two small evaporating dishes, two glass funnels, one packet of filter paper, three inches of platinum wire, two convex watch glasses, one nest of small beakers, a small retort stand, one piece of charcoal, blow-pipe, and sulphurated hydrogen apparatus.

Then as to reagents. Most of those needed for this work are already on our work benches.

The following few practical notes will be found useful to those to whom this subject is new:—

(1) When adding a reagent to a solution, and an unknown precipitate is formed, be sure and add sufficient to ensure that the whole of that precipitate is thrown down.

(2) Wash every precipitate twice by pouring water on the filter containing same.

(3) Do not hurry, therefore, if a precipitate is not produced immediately you add the reagent. Some reactions are at once apparent, and others take some little time.

(4) Always test an unknown substance for the base or metal first, and then for the acid which has combined with it. For example, in sodium chloride the sodium is the base or metal, and the chloride is from the hydrochloric acid which has combined with the metal.

(5) Always confirm the result given by one reagent by testing with another reagent for the same substance. For example, in adding a solution of barium chloride to an unknown solution, you may get a precipitate soluble in hydrochloric acid, and yet it may not be a sulphite.

(6) To test with borax beads, place a little borax on the loop of your platinum wire, and hold it in the Bunsen flame, it will boil up and then fuse to clear glass. Now place a very little of the substance to be tested on the bead, heat same and allow to cool, now notice the colour of the bead; if the bead is too dark to make out the exact colour, add more borax and heat again. Chromium gives an emerald green bead, uranium a yellow bead.

(7) To make a platinum test wire, take two inches of platinum wire, double it in half, twist togother so as to get a small loop at one end, mount plain end on a small glass tube to form a handle, take a small test tube, fit a cork, and make a hole in it to take the glass handle, fit the cork over the glass handle, half fill the tube with weak hydrochloric acid, now put cork into test tube, and you always have your wire clean and ready for use.

(8) *Flame Tests.*—Hold the platinum wire in flame until it ceases to give and intense yellow colour, then place a little of the substance on wire, and hold it in the lower part of flame. Sodium gives a powerful yellow colour, potassium a pale lavender.

The first step in the analysis of an unknown substance is to dissolve about twenty grains of same in two ounces of distilled water; if not soluble in water, then dissolve in hydrochloric acid, in nitric acid, or in aqua regia. Having dissolved our substance, our next step is to divide it up into one or more of the six groups—to do this, what are known as analytical tables are used—these six groups depend for their power of dividing a substance upon the fact that a certain definite reagent will always precipitate certain metals under definite conditions. These six groups are arranged as follows:—

Group I.—Silver and lead precipitate as chlorides with hydrochloric acid.

Group II.—Mercury, platinum, and gold are precipitated as sulphides by the action of sulphuretted hydrogen.

Group III.—Iron, aluminium, and chromium salts are precipitated as hydrates by the action of ammonium hydrate.

Group IV.—Uranium is precipitated as a sulphide by ammonium sulphide.

Group V.—There are no important metals used in photography precipitated in this group.

Group VI.—This group contains sodium, potassium, and ammonium, which three salts are all soluble in all the previous four groups.

After you have separated your unknown salt into the above groups, you must subdivide the precipitates of the group into their final divisions, directions for which are given in the detailed table in this paper. The next step after having discovered the metal or bases is the detection of the acids. For these tests use fresh solution each time.

(*a*) *Sulphuric Acid and Sulphates.*—Free sulphuric acid is distinguished from a sulphate by its charring action on cane sugar. On adding barium chloride to a sulphate a white precipitate insoluble in hydrochloric acid denotes sulphuric acid. To confirm, dry the precipitate, mix with fusing mixture, and heat on charcoal, with the aid of blow pipe for a few moments; then take a little of the residue, powder it, and place it on a bright silver coin, add a drop of water, and a brown black steam will result.

(*b*) *Hydrochloric and Chlorides.*—Add silver nitrate; a white precipitate soluble in ammonia turns violet at exposure to light, insoluble in nitric acid.

Dissolve Salt in Water or Weak Acid; add Hydrochloric Acid in Excess.

Precipitate, Wash, Boil, and Filter.		Filtrate. Pass H_2S through the Solution.				
Precipitate.	*Filtrate.*	*Precipitate.* Boil with Hydrochloric Acid, and add HNO_3 drop by drop until PPT is dissolved. Divide Solution into Three Parts.			*Filtrate.* Boil Solution, then with a few drops of HNO_3, then add NH_4CL and NH_4HO. Filter.	
		No. 1.	No. 2.	No 3.	*Precipitate.* Wash PPT, dry, fuse with $NACO_3$ and KNO_3, boil in Water, and Filter.	*Filtrate.* Add Ammonium Sulphite, Water, and Filter.
Dissolve PPT with $AmHO$, add HNO_3. White PPT SILVER NITRATE. The PPT becomes purple when exposed to daylight.	Add dilute H_2SO_4, white PPT of LEAD *Sulphate.* Fuse with blow-pipe, when globules of *Metallic Lead* are formed, which mark paper.	Add Stann., Chloride, White PPT, which turns grey. MERCURIC SALTS.	Boil with Oxalic Acid, PPT the *Metallic Gold.*	Evaporate down with Ammonium Chloride. PPT of *Ammonic Platino-chloride.*	*Precipitate.* Residue brown, IRON. Test original solution for Ferrous or Ferric Salts.	*Filtrate.* Add NH_4CL, and heat. White PPT ALUMINIUM. Add Silver Nitrate. Red PPT CHROMIUM.
					Precipitate. Black PPT URANIUM. Borax, lead, yellow colour.	*Filtrate.* Evaporate. Heat till all fuming ceases, cool, and dissolve in very little water. SODIUM, yellow flame. Add Platinic chloride and ALCOHOL. Yellow PPT POTASSIUM. Test Original Solution for AMMONIUM.

(*c*) *Nitric Acid and Nitrates.*—To a weak solution add equal bulk of a fresh solution of ferrous sulphate, hold the test tube on the slant, and carefully pour down the inside of tube strong sulphuric acid, after a few seconds a brown ring will be formed at the junction of the two liquids. A little gentle shaking assists the formation.

(*d*) *Carbonates.*—When treated with hydrochloric acid, evolve carbon dioxides; if the gas is allowed to bubble through a solution of lime water, it will become milky, and a precipitate of calcium carbonate will result.

(*e*) Bicarbonates or hydric carbonates give off carbon dioxide on boiling the solution; the solids dissolve in boiling water with effervescence.

(*f*) *Sulphuric Acid and Sulphites.*—Barium chloride gives a white precipitate *soluble* in hydrochloric acid.

Place in a test tube some granulated zinc, add hydrochloric acid, let it effervesce, then pour some of the solution to be tested into same, sulphuretted hydrogen will be given off, which may be detected by the smell and its power of turning lead paper black.

(*g*) *Thiosolphates.*—On adding hydrochloric acid to a solution, a precipitate of sulphur with a smell of sulphur dioxide. Silver nitrate gives a white precipitate soluble in nitric acid, the precipitate is blackened on heating.

(*h*) *Bromides.*—On heating with sulphuric acid and black oxide of manganese, bromide is given off, which may be identified by its red colour, its power of turning starch paper yellow, will also precipitate silver nitrate, insoluble in weak nitric acid, but soluble in ammonia.

(*i*) *Iodides.*—Heat with sulphuric acid and manganese as in test (*h*), wet starch paper will be coloured purple; will also precipitate silver nitrate, almost insoluble in ammonia.

(*k*) Ferrocyanides give, with silver nitrate, a white precipitate insoluble in nitric acid and ammonia.

(*l*) Ferricyanides give with silver nitrate orange-red precipitate, soluble in ammonia.

(*m*) *Cyanides.*—With silver nitrate give a white precipitate, insoluble in nitric acid and ammonia. Silver cyanide when heated to red heat is reduced to metallic silver.

(*n*) *Citric Acid and Citrates.*—When heated with sulphuric acid will char, blacken, and give off a faint odour of burnt sugar, and afterwards give off irritating fumes of sulphur dioxide.

(*o*) *Oxalic acid and oxalates.*—When the dry salt or a concentrated solution is heated in a test tube with sulphuric acid, carbonic oxide gas and carbonic acid are given off, the former of which will burn at the mouth of the tube with a blue flame. A solution of gold chloride is reduced to a metallic state on the addition of an oxalate.

This must now conclude my brief notes of the means and methods of the detection of the many chemical salts used in every-day photography. I have endeavoured to strictly limit this paper to dealing with those salts with which every photographer is well acquainted. I would strongly recommend all of you who intend to take up this subject to purchase a small text-book entitled *Practical Chemistry*, by Tilden (Longman, Green, & Co.) price one shilling and sixpence.

In closing these remarks, I am satisfied they will not have been in vain if I have in any way removed any of the difficulties which have existed in the minds of those of you to whom chemical analysis is a thing of the future.

ERNEST BENEST.

THE EFFECT OF KEEPING PLATES AND FILMS AFTER EXPOSURE

[Written for the ALMANAC, but received too late.]

THERE is some difference of opinion among experienced photographers as to whether, if an exposed plate or film is kept for any length of time between exposure and development, there is an alteration in the latent image, and the general opinion with respect to plates has been, that a plate may be kept for a considerable time without there being any noticeable change; but, in the case of celluloid films, it has been asserted that, if an exposed film is kept for even a few weeks before development, the latent image fades or becomes less capable of development.

To test this point, the writer carried out the following experiments:—Somes plates and films, coated with the same emulsion on January 3, 1894, were exposed on February 9 of the same year, both plates and films receiving exactly the same exposure, the exposures being made in the studio on a day when the light was very steady, a necessary condition to ensure the exposures being all exactly alike.

One of the exposed films and one plate were developed at the time, and yielded identical negatives, proving that the plates and films were of the same speed.

On April 10, two months after exposure, another plate and film were developed, both giving excellent negatives, there being no difference evident between them. Comparing them, however, with the other films and plates exposed at the same time, and developed at once, both plate and film developed, after being kept two months, had the appearance of having received a slightly fuller exposure.

A further trial was made on October 26, more than eight months after exposure, by developing one plate and two films, which had been packed during this time in the following manner, the two films face to face, and the plate face to face with an unexposed plate from the same box. One plate and one film of this set were developed together in one dish with the same developer; both developed readily, but showed apparent over-exposure, which was slightly more pronounced in the case of the film. The remaining film of the set was developed with a more restrained developer, and gave a good vigorous negative.

On the same date, October 26, another set of one plate and two films, which were exposed on February 9, at the same time as the others, and which, during the interval, had, in order to test the effect of celluloid in contact with the latent image, been packed with the face of each plate and film in close contact with a sheet of celluloid, were also developed with exactly similar results to those yielded by the previous experiment, both plate and film developing readily and cleanly, but showing apparent over-exposure, the film to a slightly greater extent than the plate.

The results being identical, whether the face of the exposed plate or film were left in contact with plain celluloid or with the emulsion-coated face of another plate, shows that the celluloid had no prejudicial effect upon the latent image.

From these experiments it would appear that not only is there no fading of the latent image, but that there is a slight progressive or continuating action of the light, comparable to that which occurs in the case of exposed carbon tissue, and that the treatment indicated, when a properly exposed plate or film has been left for months between exposure and development, is the use of a more restrained developer such as would be used in the case of known over-exposure.

No single set of experiments can be considered as affording conclusive evidence in a question of this kind; but, although further trials may afford another explanation, the writer considers that the most reasonable explanation of the change which (as shown by these experiments) takes place in the latent image when an exposed plate or film is kept for a lengthened period before development is to be found in a continued action of light.

The plates and films used were Messrs. B. J. Edwards & Co's. instantaneous isochromatic, the experiments would have been more complete had a duplicate set of trials been made with ordinary plates, and the results compared with those obtained upon colour-sensitive plates; but there is no reason to expect that the results obtained on ordinary plates and films would have been different to those here recorded.

W. H. BARNES.

METHOD.

[Written for the ALMANAC, but received too late.]

As I have found much advantage in photographic field-work from following some system of operations, I propose to submit mine to your readers and, although they may not care to follow it entirely, it may help some one to mould his own system, and thus avoid many a mishap through forgetting some little thing or action. My note-book is an ordinary one ruled for accounts; on the left-hand page I leave the first space for the register number of negative, and immediately after exposure I enter the number of slide, plate, lens, &c., and exposure; on the right-hand side, the subject and other details, leaving a space wherein to note that the plate has been developed. At the end of the book I enter the notes as to how the slides are filled, keeping one line for a box of plates; and, when I fill the slides, I note the numbers of those which contain the different kinds of plates, underlining those in which the plates are backed. When I have exposed any plate, I cross out the number of slide from the notes at the end of the book, and enter it immediately in the details of exposure first referred to, and, having entered the other details, I return the slide to its bag, with the side last exposed next to the button of same. I find this a great help to my memory. In this manner it is easy to expose any plate I may want without going through in regular rotation, or exposing the same plate twice or more times.

On taking out a plate for development, I cross out the number of slide from the details of exposure in note-book, and when developed, I mark the space left for that purpose as before mentioned.

I fear my contribution to your ALMANAC (to which I wish much success) is but a very poor one; however, if it causes any one to appreciate methodical work as I have done, I shall be satisfied.

J. A. C. BRANFILL.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

[Written for the ALMANAC, but received too late.]

MAY I, Mr. Editor, be permitted to call the attention of your readers to the Photographic Convention Meeting at Shrewsbury, in July 1895?

Our meeting last July, at Dublin, was most successful. Sir Howard Grubb proved a model President, and the local committee, together with the Photographic Society of Ireland, spared no pains to make the Dublin meeting a record gathering of the Convention.

Mr. Ruthven, the local Hon. Secretary, will always be, in the minds of those of us who visited Dublin, as an organizer without equal, to say nothing of his unfailing courtesy to every one.

Meeting as we do, year by year, in important centres such as Derby (the first), Glasgow, London, Chester, Bath, Edinburgh, Plymouth, and last July at Dublin, and under the presidency of such leaders in photography as J. Traill Taylor, Andrew Pringle, Professor Bothamley, George Davison, (the late) William Bedford, George Mason, and Sir Howard Grubb, and with successful honorary secretaries like J. J. Briginshaw, and F. P. Cembrano, jun., we claim to afford to photographers from all parts of the world, be they professional or amateur, specialist or enthusiast, a happy means of seeing, hearing, and discussing matters of photographic importance, in company with the foremost workers in our art-science.

We would like to see amongst us representatives from *every* photographic society in the United Kingdom, and we are generally favoured with the presence of some of our American cousins interested in photography, we would gladly welcome *many more* of them. Our meetings are held at the most pleasant time in the year, and the facilities we are afforded for photographing places and objects of interest, which at other times are debarred from being photographed, should recommend our yearly outing to all who enjoy pleasant scenes with pleasant companions.

Our next Assembly in July, 1895, at Shrewsbury, will probably, owing to its more central position, attract still greater numbers than were at Dublin. The local committee, with Mr. Martin J. Harding as local Hon. Secretary, are busily working away at the arrangements for our reception, and everything promises to make our gathering in charming Shropshire most memorable to all who are able to attend.

The addition to our Council of such Shrewsbury gentlemen as Mr. F. W. Williams, Mr. W. Allfree, Mr. Wallace Heath, Mr. W. Burson, and Mr. J. L. Della Portar, will serve as an additional guarantee that nothing will be found wanting to make a great success of the 1895 meeting of the Photographic Convention at Shrewsbury. R. P. Drage.

A CHEAP DARK-ROOM LAMP.

[Written for the Almanac, but received too late.]

A very good dark-room lamp can be made with a hock bottle.

Procure a hock bottle, which can easily be had from an hotel, and knock the bottom out. There is no need to cut round it with a diamond or a file, but simply hit the centre of the bottom with the end of a poker, or, better still, with a mason's chisel, as you can take a shorter hold, and have more control over it.

All that is now necessary is to take half a candle, which is quite long enough, light it, and set it standing in a convenient place, and put the bottle over it, as you would place a chimney on a lamp. There is no need to cover the neck of the bottle.

Such a contrivance will give a splendid light for developing, and the colour of the bottle is quite safe. Perhaps it will be necessary to put the end of a match under one side of the bottle for ventilation.

With a little extra trouble a suitable stand may be made to hold the candle.

I have developed many plates with this lamp, and have had no trace of fog. H. A. Railton.

A VISIT TO BIJAPUR.

[Written for the Almanac, but received too late.]

Being as a rule greatly interested in all places of historical interest, especially the remains of Eastern grandeur, I made up my mind to visit the ruins of Bijapur, which has been called the Palmyra of the Deccan, and, having read short accounts of its architectural greatness, I decided on taking a camera. So, after a journey of eighteen hours through an uninteresting flat country, although the first part of the journey was ascending the Western Ghauts where at some parts the view is magnificent, we sighted the domes and minarets of Bijapur, though we did not arrive there till an hour later. As the station is almost against the city walls and within a stone's throw of the "Great Dome," we soon reached the Traveller's Bungalow, which is the mosque attached to the Great Dome. This building is the tomb of Sultan Mahamod, one of the kings of Bijapur and is the most massive building in the place, being about 200 feet square, and the dome 145 feet diameter, and rises to a height of 198 feet. Having exposed a couple of plates on this monument, it was time to dine and shortly after goto bed. We slept in spite of the fact that we were in a city of the dead, surrounded with tombs and vaults of generations and that the owls and bats had free access into our compartment, which went far to make one feel somewhat uncanny.

The next morning we drove out and photographed several of the places of interest, and obtained several good negatives. I developed the plates the same night—I usually develop my plates on the spot if I am staying for a few days—which ensures taking back only what is worth carrying. and also saves a lot of rush, as when developing a whole week's batch on returning. I find, by carrying dishes that fix into each other, and hypo and alum dry, that very little room is taken up; for developer I generally use "Optimus" infallible developer, which gives good dense developed negatives, but I find it necessary to give a rather long exposure, although I have developed snap-shot exposures with the same, which is a very slow process.

We spent several enjoyable days in this place, visiting all the places of interest, and the old fortifications, where we saw several old-fashioned pieces of ordnance of immense size; but our special delight was to ascend to the top of some building before dark, where we could obtain a view of the whole city, and single out the principal objects to which history and tradition have lent such a charm, and allow our imagination to carry us back to the times when those stirring scenes were enacted therein, in which some of India's noblest played an important part; but all this happened long ago, and now the city is dead, and its stillness is like the grave, nothing more exciting is there to stir the pulse than the start given one by the noise of owl or jackal in the dead of night. Such is Bijapur; yet we left it with regret to its loneliness and decay, though we would have fain lingered 'mid its memories, which have thrown around it the halo of romance. H. Head.

Our Editorial Table.

Photo Wastes.

Robert Pringle & Co., 40 and 42, Clerkenwell-road, E.C.

Every professional photographer should have a copy of Messrs. Pringle's little pamphlet by him. It gives most excellent advice on the treatment of photographic wastes from the dark room, the printing room, the toning room, the fixing room, stating the precipitants to be employed, and giving general directions for the care of, and transmission of, the precipitates to the refiners. A copy of the pamphlet will be forwarded by Messrs. Pringle to professional photographers on receipt of business card.

Scholzig's "Presto" Paper.

Otto Schölzig, 31, Binfield-road, Clapham, S.W.

Mr. Schölzig is introducing a glossy print-out paper, which, with a very short exposure, produces a faint image that may be developed up in the usual way. We have tried the paper, samples of which have been sent us, and are pleased at the excellent results it yields. The following are the instructions given:—

Printing.—Expose under the negative, in daylight or artificial light, until a faint trace of the image is visible. Strong daylight will do this in less than a minute; dull daylight and artificial light will take a proportionately longer period.

Developing.— *Stock Solution.*	
Eikonogen	60 grains.
Soda sulphite (pure)	240 „
Potassium carbonate (pure)	120 „
Ten per cent. solution of potassium bromide	30 minims.
Distilled water	5 ounces.
For use, mix—	
Stock solution	4 drachms.
Water	10 ounces.
Ten per cent. bromide of potassium solution	15 minims.

For every whole-plate print, or its equivalent, that has been developed, one drachm of stock solution should be added to keep up normal strength. Make up fresh solution when the old is discoloured. If cold black tones are wanted, reduce the amount of bromide from 15 to 10 minims. Be very careful and exact in your weighing and measuring. Put the prints by gaslight or subdued daylight, without washing, in the developer, and keep turning them over and over (not simply rock the dish, which is quite insufficient to secure even development). The image will come up in about four to five minutes. Remove the print to the washing water when they are a light red colour, as they go on deepening a little during washing. After five minutes' washing in running water, place them into the toning bath.

Toning.—	
Sulphocyanide of ammonium	1½ drachms.
Chloride of gold	3 grains.
Water	16 ounces.

Turning the prints continually over until they have reached the desired tone (which does not change in the subsequent fixing bath), wash and

Fixing.—Fix in

1 ounce hypo to 5 ounces water.

Wash well for one hour, and treat same as any gelatine emulsion paper. Have all solutions and washing waters as cool as possible.

The American Annual of Photography.

New York: The Scovill & Adams Company.

The older this *Annual* becomes the better and more plethoric it grows, from which it follows that the present one excels its predecessors. The volume for 1895 is very richly illustrated, containing as it does no fewer than 200 phototypic engravings, while the literary matter, too, is much above par. The contributors reside both in the new world and the old, and embrace such names as Andressen, Burton, Ehrmann, Klauser, Duchochois, Dresser, Mason, Sarony, and Emerson, eighty-seven in all.

One of the portraits by Dr. Emerson entitled a *Naturalistic Portrait, taken in the Open Air with a Tele-photo Lens*, is so much in harmony with his brief explanatory article on what naturalistic photography is and is not, that we are tempted to quote the article in full.

"What is a Naturalistic Photograph?

By P. H. Emerson, Ph.D.

1. A photograph true to the sentiment of Nature.
2. A photograph giving the visual *appearance* of things as truly as possible.
3. A photograph in which the *foci* of different planes are so arranged as to help give this truthful appearance.
4. A photograph that is decorative, in addition to the above qualities.

A Naturalistic Photograph

is not merely a photograph with one plane sharp and the rest fuzzy, as asserted by the muddle-headed idiot.

Is not merely a blurred view, as suggested by the incompetent operator.

Is not every photograph printed on matt surfaces, as suggested by the unintelligent.

Is not a 'fuzzy' thing, as hinted by the backbiter.

A naturalistic photograph requires a man of strong artistic sense to produce, and a refined artist to appreciate, but it is doomed to the sneers and contumely of the Chicago and purely British section of the photographic press, Philistines who have sneered in their day at Whistler."

Now, the portrait given in illustration is not a very pronounced fuzzytype so far as the face is concerned, it is merely unsharp and flat; but the drapery is fuzzy *in excelsis*, a veritable blurred view, "as suggested by the incompetent operator." Hence we conclude that the talented writer could not have had this picture before him at the moment his trenchant definitions of naturalistic photography were being written.

One reads with lively interest Prof. Ehrmann's reply to the question, "When is a Photographic Print Fixed?" if only from the fact that this eminently practical teacher has "joined the majority" since writing his article. This article we shall specially bring under the notice of our readers on an early occasion, when our columns are less crowded, and this applies also to several others of equal excellence. The usual tabulated matter has been carefully selected from our own and other sources, in addition to what seems to us as quite original.

Taken all in all, the *Annual* is one of great value. As usual, it is admirably printed on stout calendered paper, a factor in explaining the excellence and brilliance of the numerous engravings interspersed throughout its pages. Jonathan Fallowfield is the London agent. It sells at 2*s.* in paper covers.

The Strand Magazine,

London: George Newnes, Ltd.

Whenever we look through the pages of the *Strand Magazine* we realise, each time more vividly than before, how very much such serials owe to photography. It is not too much to say that but for it most of them could not exist at all, so completely does our art-science conduce to their illustrations. To this the *Strand* forms no exception, for we can recognise photographic aid in almost every one of its illustrations and this in various forms, direct half-tone prints from the negative, half-tone prints from wash and pencil drawings, and line subjects from pen-and-ink drawings, each one being effective in its way. The Christmas double number contains 320 illustrations in 208 pages.

The literary contents are led off by an exciting military story by A. Conan Doyle. In an illustrated interview with Hyram S. Maxim, J. Bucknall Smith gives us a graphic sketch of the career of this eminent inventor. "Caricaturists and their Work;" "The Bible: How it is Printed and Circulated;" "Pantomine Masks and Properties;" "The Athletes of the Year," and many other articles of interest all conduce to making a Christmas number of real merit. Among the "Portraits of Celebrities" are those of the King of Fashion, M. Worth (who is not, as generally supposed, a Frenchman, but a native of Bourne, Lincolnshire); Prince and Princess Adolphus of Teck; the Bishop of Ripon, and "General" William Booth. The portraits of these are taken at different periods of their lives.

The *Picture Magazine*, by the same publishers, accords the place of pictorial honour to selections from the zoological works of Mr. Gambier Bolton.

News and Notes.

Messrs. S. J. Levi & Co., 71, Farringdon-road, write: "We should esteem it a favour if you will kindly inform the trade through the medium of The British Journal of Photography that our warehouse will be closed on December 22 at two o'clock for the Christmas holidays, and that we shall not reopen until Thursday, the 27th."

A Music Professor in Trouble.—At Reading Police Court on Saturday, December 8, 1894, Arthur A. H. Warwick, described as a professor of music, of 83, Blenheim-road, was brought up in custody, charged with stealing a camera, value 2*l.* 10*s.*, on October 20, the property of Henry Lewis, of Dann's, Reading. Prosecutor stated that about the middle of October prisoner came to the shop and said he wanted to borrow a camera for a few days, as his was being repaired. He lent him the one produced in a case; it was worth 50*s.* He did not return it. Charles Cosell, assistant to Mr. Goodacre, pawnbroker, &c., St. Mary's Butts, said that on October 20 he let the prisoner have 15*s.* on the camera. It was redeemed on November 15. Edward Jew, residing in the London-road, deposed as to prisoner offering to sell him the pawn ticket for 5*s.* 9*d.* on November 14. He bought it, and on the following day he paid the interest due on it at Goodacre's. D.S. Levi proved the apprehension of the prisoner at his residence. On reading the warrant to him, prisoner replied, "It was not stolen; I have got it on hire." Prisoner pleaded guilty to this charge. He was then charged with stealing a pair of opera glasses on October 25, value 15*s.*, the property of John H. Deray. Prosecutor, who carries on the business of a jeweller at 44, London-street, stated that on October 25 prisoner came to his shop and borrowed some opera glasses, which he said he wanted to use at Mr. Sims Reeves's concert. He promised to return them the following morning, but he had not seem them since. D.S. Levi also gave evidence on this charge, and prisoner, who pleaded guilty, but said he had no intention of stealing the glasses, was sentenced to two months' hard labour on the first charge, and one month on the second, the sentences to run concurrently.

The Late Richard Keene.—Mr. G. Hepworth, of Brighouse, writes: "Permit me, as a personal friend of the late Mr. Richard Keene, to add my testimony to the esteem in which he was held by all who had the privilege of intimately knowing him; and who did not know him, personally or by repute? as his name and fame were of a world-wide character. But what makes my sorrow and regret at his sudden death more poignant is the fact of his having so recently been a guest at my house on his visit to this town, little more than a month ago. In my capacity as one of the Vice-Presidents of our newly formed Photographic Society, I invited Mr. Keene to favour us with the delivery of his lantern lecture on the *Peak of Derbyshire*. With his usual kindness, he readily consented to do so, and came here on November 14 last. The crowded audience which assembled on that date to hear him were greatly delighted with the lecture, and testified their appreciation of it by frequent applause, as the lecturer described in graphic and racy language the beauties and antiquities of his loved county of Derbyshire. The 150 slides, with which the lecture was illustrated were of Mr. Keene's own production, and, needless to say, both technically and artistically were all that could be desired. On the two following days after the lecture, the writer had the pleasure of Mr. Keene's company in visiting two interesting villages in the neighbourhood, which abound with subjects for the camera. On the second of these visits the writer, at Mr. Keene's suggestion, took his camera with him, and obtained some negatives of the place visited, which have now a mournful interest attached to them, seeing it was probably the last photographic outing Mr. Keene took part in. On parting with Mr. Keene, on his return home, at the Brighouse railway station, on Friday, November 16, I little thought that this, his first visit to the West Riding of Yorkshire, would be his last. In conclusion, may I express the hope that the mantle of his genius may fall upon his gifted family, and all will join with myself in extending to them our deepest sympathy in their great sorrow."

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 24,083.—"An Improved Central Vertical Swing Back for Photographic Cameras." H. H. O'Farrell.—*Dated December*, 1894.

No. 24,109.—"Improvements in and connected with Dark Slides for Photographic Cameras." M. A. Stubel.—*Dated December*, 1894.

No. 24,229.—"Improvements in Portable and Adjustable Incandescent Gaslight Apparatus for Photographic or other Purposes." P. H. D. Buttrum and W. Thorneycroft.—*Dated December*, 1894.

No. 24,342.—"Improvements in Condensing Lenses for Use when Enlarging Photographs by Artificial Light." J. Harrington.—*Dated December*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
27	Camera Club	
27	Glossop Dale	
27	Halifax Photo. Club	
27	Hull	
27	Oldham	
27	West London	
28	Bristol and West of England	*Demonstration of Carbon Printing.* E. Brightman.
28	Cardiff	
28	Croydon Microscopical	
28	Holborn	
28	Maidstone	
28	Swansea	
29	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 13.—Mr. L. Medland in the chair.

Mr. W. T. Wilkinson was elected a member.

Mr. R. P. DRAGE announced the death of Mr. Richard Keene, of Derby, the President-elect of the Convention, and proposed that an expression of condolence be sent to the family.

Mr. WELFORD, in seconding the proposition, referred in sympathetic and appreciative terms to the late Mr. Keene's personal good qualities and photographic skill. The proposition was carried unanimously.

In reference to Mr. Haddon's paper on the *Fading of Albumenised Prints*, read at the previous meeting, Mr. J. E. Hodd showed an albumen print of a landscape thirty years old, which had been hung in a living room. The print appeared to be in a good state of preservation, although the sky and distance had yellowed and faded.

Mr. A. HADDON humorously remarked that he should be pleased to print Mr. Hodd's portrait in the sky part of the print.

Mr. W. D. WELFORD described and illustrated his system of binding sets of lantern slides. He used distinctive colours for the bindings, and these, again, could be further distinguished by small coloured strips attached, so that great variety was obtainable. The advantage of the plan was the readiness with which a particular series could be recognised. Mr. Welford incidentally mentioned that he had over 2000 lantern slides bound in this way and placed in drawers.

This was a Lantern Night, and slides by Mrs. Welford, Mr. Welford, Mr. Cole, Mr. Bayston, Mr. Medland, Mr. Hodd, and Mr. Austin were shown.

There will be no meeting on Thursday, December 27.

PHOTOGRAPHIC CLUB.

DECEMBER 12,—Mr. F. A. Bridge in the chair.

Mr. Tottem showed some Blair rollable film negatives exposed and developed by an amateur, who had only been practising photography a few months. They were acknowledged to be very good indeed.

A discussion upon the amnufacture of celluloid took place, in which the Chairman, Mr. Foxlee, Mr. Edwards, and Mr. Barnes took part.

Mr. EDWARDS thought that a perfect celluloid could not be made in England.

Mr. BARNES said a a sensitised piece of celluloid would deteriorate if kept at a high temperature.

Mr. NESBIT asked if any one had seen the pictures in natural colours shown at Lombardi's studios?

Mr. R. CHILD BAYLEY said that he had, but could give no description of the process employed. They appeared to be made up from three pictures by stopping out parts of each.

Mr. EDWARDS, referring to his paper recently read, said that he did not wish it to be supposed that it was antagonistic to anything that had been said, or that he wished to upset pet theories; his intention was simply to show that photographers had had, and constantly used, another power other than control in timing in development.

Mr. Welford showed a number of slides from hand-camera negatives taken by Mrs. Welford and himself.

Brixton and Clapham Camera Club.—December 11.—Mr. T. J. BARTROP filled one of the series of Instruction Evenings with a paper on *Lantern-slide Making*, treating of the various sources of light available for printing, and the circumstances under which each was most suitable, the characteristics of different kinds of plates, the modifications in tone obtained by variations of the exposure and development, and concluded with a demonstration of both the contact and the reduction methods of printing, the slides made being passed through the lantern at the close.

Ealing Photographic Society.—December 13.—Mr. A. S. HANDFORD gave a lecture-demonstration on the *Carbon Process*. Referring to its early history, he said that the action of light on sized paper which had been immersed in a solution of bichromate of potash was first observed by Mungo Ponton and Becquerel. The early experiments were carried out by mixing lamp-black with gelatine, and, as the former is nearly pure carbon, hence arose the name, but now the "pigment process" would be a more correct title. The basis of the process is that, if gelatine, mixed with a solution of bichromate of potash, be exposed to light, it becomes insoluble, and, if not so exposed, it is readily soluble. The lecturer explained that the outer surface of the tissue exposed under a negative is acted on all over by light, and rendered insoluble; hence the necessity for transferring the exposed tissue on to a support, so that the back or soluble portion may be got at. In 1862 Mr. Swan took out a patent in connexion with this process, and to him is due the credit of producing the first perfect prints on paper. In 1869 discoveries by Mr. Johnson greatly simplified the process, and rendered the use of a rubber solution unnecessary. The single transfer process is the simplest method of obtaining permanent pigment prints on paper or any other surface; but, as no change is observed during printing, some indication is necessary. This can be obtained in the form of actinometers, several of which were shown and explained; and practice is also necessary to enable one to judge correctly the time required for printing. It is also necessary to place a safe edge round the negative. Mr. Handford proceeded to develop several prints. The print and support are brought together in cold water, air bubbles avoided, and are squeegeed down and placed between blotting-paper for a few minutes, then placed in warm water, and, as soon as the pigment oozes out, the backing paper is stripped and the soluble portions washed away. The print, being now developed, is placed in cold water; this stops all further action, and, by placing in a five per cent. solution of alum, the free bichromate is dissolved, and the print rendered insoluble, even in the hottest water. The lecturer then showed the way to obtain prints on opal, glass, &c., and some very fine examples were shown. The double transfer process was briefly explained. Numerous questions were asked, and satisfactorily answered, and a most interesting and instructive evening closed with a hearty vote of thanks to Mr. Handford, proposed by the Chairman (Mr. H. W. Peal), seconded by Dr. Gibbons, and carried unanimously.

Hackney Photographic Society.—December 11.—The ordinary business being suspended, a large number of members and their friends assembled to hear a lantern lecture by Mr. S. J. Beckett, in the hall of the Young Men's Christian Association, Mare-street. The subject was *Italy*, and was illustrated by about 200 fine slides.

North Middlesex Photographic Society.—December 17.—Mr. H. STUART (a member) read a paper, and gave a demonstration on *Enlarging by Limelight*, that being the last of the Instruction Evenings for 1894. Dealing with the opinion that the process of enlarging alters gradation to the disadvantage of the resulting print, he held that, though altered gradation might be obtained, yet to say that it was inseparable from the process was not correct; given a suitable negative, and an attempt to work an unsuitable one in that as in any other printing process, meant failure. With a good light well under control, he maintained that there need not necessarily be any alteration. He was also of opinion that the resulting softness in an enlargement was generally far better than could be obtained by any manipulation of the lens in a direct negative. Assuming, therefore, that equally good results could be obtained by this process, the saving of weight of apparatus necessary to be taken into the field was so great, that enlarging needed little else to recommend it. If artificial light were used, we must have a lantern. Above all things, let this be solid. Rather err on the side of clumsiness than flimsiness. Not only the lantern, but the bench on which it is used, and the screen on which the picture is projected, should be substantial. Whatever system of lighting were adopted, the object should be to obtain a light of such efficiency and actinic power that the exposure be not unduly prolonged. For use with a condenser, the source of light should be a point, as anything beyond that point was not only unnecessary but actually detrimental to good definition. In working with bromide paper, if a very long exposure were necessary, say twenty minutes or half an hour, unless the atmosphere of the room in which the work was being done was approximately the same temperature and humidity as that in which the paper had been kept, difficulties would show themselves. As a rule, the room would be more or less damp, and the paper, in absorbing this moisture, would stretch. He had come to the conclusion that an exposure on paper, in damp weather, of more than seven or eight minutes, was not advisable, but that from ten seconds to two or three minutes was the most serviceable. There was no advantage in stopping down further than was necessary to get a sharp image. A thin soft negative full of detail would give the best result, an under-exposed hard negative being quite useless. It was necessary to carry development far enough, for a print that looked quite vigorous in the dim light of the dark room was frequently found to be undeveloped on taking it into a good light. He then proceeded with the demonstration.

Putney Photographic Society.—December 13, Dr. W. J. Sheppard in the chair.—Mr. A. H. SMITH, a member of the Society, gave an extremely interesting and instructive lecture on *The Cyclograph*, a new instrument designed by the lecturer and constructed by Messrs. Ross. The object of the instrument is to take photographs of the whole or any desired portion of the surface of a solid body approximately cylindrical in form, such as, *e.g.*, a painted vase. A dark screen, with a narrow vertical slit, whose width can be adjusted at pleasure, is actuated by a screen at right angles to the axis of the lens. The object is given a movement of cycloidal rotation, *i.e.*, that of a circle rolled along a plane, also at right angles to the axis of the lens. This movement is given to it by a rod, which is pivoted near the lens, and passes under the slit and through a turntable on which is a disk supporting the object and restricted by a coiled string. The rod is actuated by the movement of the screen. It was proved that by this means any point on the circumference is exposed on the plate when it is near the cusp of the cycloid, *i.e.*, when the lateral movement is infinitesimal, and the movement of accession and recession is photographically negligeable. For photographing a cylinder it was shown that a good result could be obtained if the slit was of such a width that an arc of not more than 15° of the object was exposed at once. If, however, the object is globular, the points on all its circumferences, except one, describe trochoids. The cusp of a trochoid is broad, and it is therefore necessary to make the slit as narrow as possible, in order to diminish the lateral movement of a point during exposure. When it is only required to photograph a part—say a half of the circumference of a globular object, it was proved that a better result is obtained if the rod is pivoted at a point behind the object instead of

under the lens. In this case the relative movements of the parts become singularly complex. The general result is that approximately equal lengths are photographed of the larger and smaller circumferences. Specimens of work were exhibited. These included some "cyclograms" taken from vases in the British Museum. These had been mounted on models made of wood turned in a lathe, and might be called solid photographs.

Richmond Camera Club.—At the meeting on the 10th inst., at which Mr. Purcell presided, Mr. A. BALDWIN, of the Eastman Photographic Materials Company, gave an exceedingly interesting and useful lecture and demonstration on the various printing papers produced by the Company. He pointed out the capabilities of Solio—glacé and matt—and showed specimens of the results to be obtained with different toning baths, especially the new platinum bath. He then described the various Eastman bromide papers, and concluded by developing, with amidol, a number of prints on nikko and platino-bromide paper, getting excellent results.

Woolwich Photographic Society.—December 13.—Three new members were elected, *i.e.*, Mr. H. Moore, Mr. J. Almond, and the Rev. E. J. Doherty, M.A.; the last-named was elected one of the Vice-Presidents of the Society. Owing to indisposition, Mr. W. H. Barnes was obliged to telegraph his inability to address the members on the subject of *Lantern-slide Making by Contact*, but Messrs. B. J. Edwards & Co. very considerately sent by special messenger a set of slides, some by themselves, and others by Messrs. Dore & Carpenter. These were passed through the lantern by the President, and were greatly admired. The meeting thanked Messrs. B. J. Edwards & Co. for their kindness, and the Hon. Secretary was instructed to write a letter of sympathy to Mr. Barnes. A hearty vote of thanks was tendered to the Hon. Secretary (Mr. J. B. Panting) for his services in connexion with the Exhibition lately held by the Society. In acknowledging the vote, the Secretary said he was glad of the opportunity to express his appreciation of the devotion of the members generally to the interests of the Society, and the untiring efforts of the Council to make the Exhibition a success.

Aintree and District Society of Photographers and Lanternists.—December 11, Mr. W. B. Hollon (President) in the chair.—The evening was occupied by Mr. W. Lockier (Hon. Librarian), who gave his interesting lecture on *Ten Days around Lucerne with the Camera*, the same being illustrated by a considerable collection of views taken by himself. At the conclusion of his paper, Mr. J. R. Jones (Vice-President) proposed, and Mr. W. H. Lloyd seconded, a very hearty vote of thanks to the lecturer for his highly instructive lecture.

Bournemouth Photographic Society.—December 11.—Mr. P. H. PRICE gave a lecture and demonstration on *Enlarging* to the members of this Society, at the headquarters, Athenæum Chambers. The lecturer accompanied his remarks by giving a practical illustration of the whole process by means of the new enlarging apparatus which has been presented to the Society by the President (Mr. J. W. Bennett). A cabinet negative was enlarged to the full size of 15 × 12 on a piece of "Barnet" bromide paper, kindly supplied for the occasion by Messrs. Elliott & Sons, the exposure being made with the aid of several strips of magnesium ribbon burnt in front of the negative. The print was afterwards developed with metol, and then fixed, the result being a highly satisfactory portrait of the President, and, considering the somewhat extemporised way in which it was done, the result reflected highly to the credit of the lecturer. Mr. Price pointed out that a negative rich in detail, with not too great a density, gave the best results. He also explained the parts of the apparatus and the various manipulations necessary to be done before commencing to enlarge, also to focus and determine the required exposure, and suggested the use of a Watkins' exposure meter for arriving at the correct exposure. A unanimous vote of thanks was passed to the President for his kind gift to the Society, also to Mr. Price for the admirable way in which he had placed this interesting subject before the meeting. We understand that the apparatus is for the free use of the members, and is to be let out for use at their own homes, and also that during the past fortnight over twenty new members have joined the Society.

Cardiff Photographic Society.—The electric light was laid on to the rooms for the first time, and experiments were made with a 200 candle-power incandescent lamp, but this was not quite a success. It was thought that the large flame had something to do with the poor illumination, and it was decided to obtain an arc lamp. The slides were shown with a blow-through jet, which gave a much stronger light than the electricity.

Hastings and St. Leonard's Photographic Society.—December 13, at the Queen's Hotel.—Mr. F. DUNSTERVILLE, from Madras, gave an interesting and graphic lecture on *India: its People, Architecture, and Scenery*, illustrated by about one hundred photographic slides, showing great technical excellence and extending over a wide range of subjects. Dr. Gray presided over a good attendance, and the names of seven new members were added for the coming year.

Liverpool Amateur Photographic Association.—December 13, the President (Mr. Alfred Tyrer) in the chair.—The annual report and balance-sheet were read and approved. The CHAIRMAN congratulated the members on the very satisfactory state of the Association's finances. Mr. G. B. Newton was elected President for the ensuing year, and Messrs. J. Sirett Brown and W. Prior Christian Vice-Presidents. Mr. P. H. Phillips was re-elected Hon. Treasurer, and Mr. John H. Welch Hon. Secretary. Messrs. Alfred Tyrer, Paul Lange, F. Anyon, J. T. Norman-Thomas, F. A. Schierwater, John Wells, and the Rev. William Smith were elected members of the Council. The result of the annual competition was as follows:—Class 1 (Champion), the Association's gold medal for the best set of six prints, Mr. T. B. Sutton; highly commended, Mr. F. K. Glazebrooke. Class 2 (Half-plate and under), silver medal, Mr. William B. Roberts; bronze medal, Mr. Alfred Tyrer; highly commended, Mr. John Bushby and Mr. George Allday. Class 3 (Six Prints over Half-plate), silver medal, Mr. T. B. Sutton; bronze medal, Mr. H. Holt; highly commended, Mr. Alfred Tyrer. Class 4 (Six Lantern Slides), silver medal, Mr. G. A. Carruthers; bronze medal, Dr. J. W. Ellis; highly commended, Mr. Alfred Tyrer and Mr. T. B. Sutton. Class 5 (Enlargements), silver medal, Mr. G. A. Carruthers; highly commended, Mr. E. Simnett. Class 6 (Three Stereoscopic Slides), silver medal, Mrs. M. E. Marriott; highly commended, Mr. William Tomkinson. Class 7 (Hand-camera Work), silver medal, Mr. T. E. C. Wilson; highly commended, Mr. H. J. C. Anderson. Class 8 (Excursion Competition), silver medal, Mr. Alfred Tyrer; bronze medal, Dr. J. W. Ellis. Class 9 (Competition open to Ladies of the Association), silver medal, Mrs. M. E. Marriott; highly commended, Miss L. Harvey.

Midland Camera Club.—December 12.—The President (Mr. H. R. LEECH, J.P.) gave a demonstration on *Appliances for Lantern-slide Making*. Griffith's lantern-slide camera was shown as the easiest and simplest for slides by reduction. The President then showed a wooden stage, designed by himself, for carrying a whole-plate and quarter-plate camera, to be used, either for enlarging or reducing, the cost of making being only half-a-crown. Shew's enlarging or reducing extension was then shown and explained; also their tilting table for correcting the errors of hand-camera negatives. One of the members (Mr. SPINNER) exhibited and explained a new hand camera, which he had invented for carrying either fifty films, or a less number of plates, the only objection being that a very small portion of the film was not used at each exposure.

Kilmarnock and Ayrshire Photographic Society. — December 15.—The usual monthly meeting of this Society was held in the Oddfellows' Buildings, Mr. J. Mack Wilson (President) in the chair. There was a very large attendance of ladies and gentlemen from Ayr, Annbank, Maybole, Manchline, Miurkirk, Irvine, Dalry, Kilwinning, West Kilbride, Newmilns, &c., as well as from Kilmarnock. Mr. THOMAS FERGUSON, Seaford-street, Kilmarnock, ex-President of the Society, who is *facile princeps* in the art of making lantern slides, gave a practical demonstation, showing how to make them. Those that he made in the presence of the meeting were afterwards thrown on the screen, and elicited much approval. Thereafter Mr. ROBERT TERRAS, photographic artist, &c., Sandgate, Ayr, gave a very successful demonstration on the *Carbon Process*, a process by which photographs can be transferred to paper, wood, stone, glass, porcelain, lantern slides, &c. Mr. Terras is a young man of exceptional ability, and since he started business on his own account has simply been overwhelmed with work. Nor is this to be wondered at, for, trained in the best studios in London and Glasgow, he has been the winner of thirteen medals in photography, including special and champion medals, both at home and abroad. After the demonstration there was a limelight exhibition of lantern slides made by members. Mr. Ferguson and Mr. Terras, Bailee Kellie, Kilmarnock; John Henderson, Kilmarnock; John Walter, Kilmarnock; Dr. Gage, Kilwinnery; Alfred James Thomson, Ayr Academy; David Meikle, Woodside, Ayr; and others, showed slides. Mr. Terras showed, among others, slides of several *genre* studies which had gained medals. The President, in a racy and humorous manner, described the slides. On the motion of the Rev. John Callan, Annbank, a very hearty vote of thanks was given to Messrs. Ferguson and Terras, and a similar one, on the motion of Bailie Kellie, Kilmarnock, was given to Mr. Wilson for presiding. At the close of the meeting it was announced that, on account of the inability of the representative of the Eastman Company to go to Ayr, the next meeting would be held in Kilmarnock on Friday, January 18, when Mr. A. C. Baldwin, the representative of the Eastman Company, would describe the various photographic articles manufactured by his firm, and give a demonstration on *Bromide Printing*, a process by which photographs can be printed on paper, &c., by gaslight as well as by daylight. It remains only to be mentioned that the Autotype Company, London, sent down a large number of photographs done by the carbon process. These were much admired when passed round the audience.

Photographic Society of Ireland.—December 14, Professor J. A. Scott, M.D. (President), in the chair.—There was a large attendance of members and visitors, and an extremely interesting lecture on *The Season's Work* was delivered by Mr. GEORGE DRURY, who showed a large number of interesting lantern slides from negatives taken in Scotland, North of Ireland, and about the County Dublin. Mr. Drury explained exhaustively the lens, stop, and exposure used in taking each picture, and answered some questions as to the development, &c. He was warmly applauded at the conclusion of his remarks, and slides were then contributed by Messrs. R. M. Inglis, E. Kelly, J. Ruthven, J. D. Keogh, and H. Goodwillie.

Port Elizabeth Amateur Photographic Society.—Annual *Conversazione*. —The large room in the Town Hall presented a very brilliant appearance on November 23, the occasion being the annual *conversazione* of the Port Elizabeth Photographic Society. The *conversazione*, we may state, was got up by the Society in compliment to those of the inhabitants of this town who are interested in works of art. Hence invitations were sent to numerous families, who, by their ready response, manifested a warm appreciation of the courtesy extended to them by the Society. The various works of photographic art were displayed to the best advantage on easels, and in the centre of the hall was a constantly rotating octagon stand, profusely exhibiting some of the finest photographs we have ever seen. The rotating motion was executed by an invisible electric motor. On the stage was extended an enormous sheet for the display of scenes by the magic lantern, and, instead of the bare edges of the sheet, as is customary, we noticed that a tasteful border had been carefully and artistically arranged. In fact, everything in the hall was indicative of the most refined taste and artistic culture. The lantern used on the occasion was of the kind known as a powerful biunial, and Mr. Alcock put forth all the resources in his power to produce the excessively pleasing effect of the Exhibition. In order to render the *conversazione* the complete success that was desired, not only did members send their most valuable photographs, but Capetown and Kimberley Societies contributed most readily and valuably. In regard to the works of art that were exhibited, there were specimens of the most recent improvements in photography—specimens that have never been publicly exhibited before. Too much praise cannot be given to the energetic gentlemen who have worked so incessantly to make the *conversazione* the brilliant success it was. Tables to accommodate four persons were disposed in every available part of the room. The exhibition of slides was judiciously varied by vocal and instrumental music.

Cape Town Photographic Club.—November 14, Annual Meeting, Mr. T. W. Cairncross (Vice-President) in the chair. There was a large attendance of members. A number of new members were proposed and admitted by ballot. The SECRETARY then read the Annual Report as follows:—"During the early part of the year 1890, Mr. B. A. Lewis, late Manager of the Gas Works, and Mr. T. W. Cairncross often talked the question over of requesting a few amateur photographers to meet at convenient times and place to exchange ideas which might be beneficial to all concerned, and at last mentioned their proposals to a few friends, but got very cold water thrown upon the suggestion. They, however, felt that if only a dozen could be induced to meet it would suffice, so a preliminary meeting was convened at the Thatched Tavern, when the following were present: Messrs. Lewis, Campion, Hayne, Pocock, and T. W. Cairncross; and it was decided to call a public meeting and to advertise it in the newspapers. The result of the meeting was most satisfactory. Not only were a large number present, but twenty-nine placed their names upon the list as members. Rules were then constructed and agreed upon. Dr. Gill, LL.D., F.R.S., &c., the Astronomer-Royal, was unanimously elected President, and a committee was also elected to take the management of the Club affairs, with Mr. B. A. Lewis as Secretary and Treasurer. It was decided that the Club should be open to both professionals and amateurs, and it is with pleasure that we can one and all look back to the great success which has attended our every movement up to the present date. Much interesting and instructive matter has been submitted in paper discussions and practical demonstrations, which have often been the means of causing members to search further into the science of photography. To others, it has pointed out their shortcomings, and has undoubtedly been the means of improvement in their work. In presenting the fourth Annual Report, the Council have much pleasure in looking back upon a year of fairly successful work and an interesting instance taken by the members, as shown by the attend ances. Last year the average attendance of members anp visitors was twenty-two, this year it has risen to thirty-four. The year commenced with seventy-one members, fifteen have resigned or left the city during the year, and the present number of members is eighty, showing a net increase of nine. Among the specialities of the year must be first mentioned the institution of the "monthly print entries" and the annual competitions. It was found that, although many prints were exhibited at each meeting, very few were finished for placing in the Club album in accordance with the old rule; and this year a new rule was introduced, providing for the reception of prints monthly, which would be available for insertion in the Club album. This has been very successful, for, whereas at the commencement of the year very few photographs were inserted in the album, it is now so full that a new one should be ordered almost immediately. During the year, 379 prints, contributed by twenty-seven members, have been handed in, 263 of which received the Judges' certificates of merit. Although the number is large, yet the Council feel that the younger members are not availing themselves of this opportunity of testing the merits of their productions. The remark has often been met with, "Our prints are not good enough." Now, the Council wish to point out that these monthly entries are not competitions, but the Judges go carefully through the work, and give a certificate (where they can) to the effect that the work is of "good average merit," or "fair average merit," as the case may be. Copies of these are then available for the annual competitions. If the members would avail themselves more fully of these entries, the album would be all the richer, it would be an incentive to better work all round, and would be the means of helping beginners by showing them what they had to rectify. Another event of the year was the visit of Sir Benjamin Stone, the President of the Birmingham Photographic Society, to whom, with his daughter (also a member of the Society), we were able to extend a hearty welcome at a *conversazione* convened for this purpose, an exceedingly pleasant evening was spent, and the address of our President and Sir Benjamin Stone were of great interest. Sir B. Stone honoured us by becoming a member of our Club. During his speech, he strongly urged the Club to undertake a photographic survey of the city and its neighbourhood, and since then the Vice-President (Mr. T. W. Cairncross) has prepared a plan of the town divided into ten districts, and at the last monthly meeting most of the divisions were allotted, so that the work has now actually commenced. It is hoped, when completed, that the result may be of such interest as to warrant its lodgment in the Public Library record. The Port Elizabeth Society have taken the initiative in offering a prize, open to all South African Societies, for the two best *Figure Studies*. Four of our members entered for this; the result, however, will probably not be known until Christmas, as the prints were sent to the editor of a photographic magazine in England for judging. While speaking of the Port Elizabeth Society, we must not omit to record our thanks to them for appointing a committee to act as Judges for five of the classes in our annual competition, the other classes being judged by Dr. D. Gills, Messrs. T. E. Fuller, J. D. Cartwright, J. F. Marshall, and Rev. J. C. Harris, to whom our thanks are also tendered. The most friendly relations exist with the other photographic societies in South Africa, viz., at Port Elizabeth, Kimberley, Graham's Town, King William's Town, and Johannesburg. Another society is in course of formation at Craddock, of which we hope to hear more in due time. Our Secretary will be very pleased to hear from any other society which may be in existence, with a view to the same co-operation which has marked the work of the above-named. We are indebted to the Kimberley Club for the loan of a very interesting set of slides of Mashonaland." The election of officers of the Club was then proceeded with by ballot with the following result: *President:* Dr. Gill.—*Vice-President:* Mr. D. C. Andrew.—*Council:* Messrs. T. W. Cairncross, C. Ray Woods, R. T. Pett, G. N. Lindup, J. R. Wignall, E. J. Steer, F. Ayres, and A. Gracie.—*Hon. Secretary and Treasurer:* Mr. A. J. Fuller.

FORTHCOMING EXHIBITION.

1895.
March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ALBUMEN PAPER: LIGHT CAMERAS.

To the EDITOR.

SIR,—Considering that we are in complete ignorance of the reasons why albumen prints fade,—I . . . ., &c. Such are, I think, the words which should begin all letters and notes written on this subject. I, and probably a great many other readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, as well as ALMANAC, read very carefully all that is said about fixing of prints, eliminating of hypo, &c.; but, unfortunately, the real article for indefinite keeping is not there yet, nor the reason why the fading appears either. I could contradict almost if not all the suppositions brought forward as more or less conclusive reasons, and not merely by saying it, but by positive proof. I have portraits at least thirty-five years old, always kept in the same album. Some are as good as new, others yellow. I have architectural photographs about fifteen years old, unmounted and flat, one against the other, and some are good and some yellow. I have a quantity of them rolled up, with the same results. I have several hundreds in books of coarse manilla paper, unmounted views; some are perfect and some yellow.

Up to this, starch or cardboard has nothing to do with these. I always use starch for mounting, and, at most, two days old in winter, less in summer.

Now, I have some views (not a few, but hundreds) mounted on linen. Some are as good as when made, some are faded at different stages—age ten years or more. I have some mounted on ordinary cardboard with same results as above, but cardboard remains perfectly white; but here, and last, is a curiosity which will upset a good many ideas which have been prevalent for a long time, viz., blaming the cardboard.

I made, in 1889, a beautiful collection of views of the Paris Exhibition on 12×10 plates, printed the views on albumen paper, and mounted them (sixty in all) on ordinary *white* Bristol board; to-day, after five years, during which time these views were kept in a portfolio rarely disturbed, the photographs are as good as the first day they were mounted, but the Bristol boards are not only tinted but decidedly yellow. Now, how about the idea that dampness brings the hypo from the cardboard through starch to photograph, and ruins the picture? Here it seems decidedly to have acted as an insulator. You can see by the above, unless I am greatly mistaken, that the question, Why do albumen prints fade? remains whole and unanswered the same as blisters, the same as —a good many other items. If I were nearer to you, I would with pleasure show you proofs of the above sayings.

How is it that manufacturers cannot come to make us some light and really portable cameras? The quantity of brass work and unnecessary wood which might with advantage be left out render the cameras heavy, and, when once out of order by a fall or a knock, very difficult to repair, unless by a specialist. I wrote you lately about a camera, 7×5, I had made, and which weighed close to eight pounds. This disgusted me so that I set to making one myself, for which I used, for easiness' sake, cut-up beech-tree wood, which, as you probably know, is very heavy, but even with this I made myself a camera for plates 5×7 inches, rising front, *double* swing back, eighteen inches draw for focussing, and the whole weighs only thirty-eight ounces four drachms exactly, or, French weight, one kilo and 200 grammes, which makes it less than one-third the one I have, and considerably lighter than any I have seen as yet for sale or advertised.—I am, yours, &c.,

A. LÉVY.

Asnières (Seine), December 12, 1894.

BLACKBALLING AT THE ROYAL.

To the EDITOR.

SIR,—I shall be glad to be allowed to add a few observations, by way of reply, to the remarks that have been made, perhaps not all of them, in your *Journal*, concerning my letter about Mr. Horsley Hinton's non-election as a member of the Royal Photographic Society. When Mr. Hinton had published the fact, circumstances that I need not trouble you with made it necessary for me to express my opinion on the matter, though obviously it was an unpleasant task. I wrote in my private capacity only, and, to emphasise this, added my private address, therefore it has been a technical error on the part of those who have so emphatically associated my letter with the official position that I hold in the Society.

I very much regret that my letter has been taken to mean more than it says. I did not state that there had been any abuse of the ballot, but only that, so far as I was able to judge, there had been. By the word "abuse" I meant a wrong use, and I did not seek to convey the impression that the abuse, if it existed, was necessarily wilfully, or even wittingly, practised, and I do not think that my letter can be fairly held to include these suggestions. In saying that under the conditions named I could only suppose that the blackballing was nothing more than

the expressions of a few persons' personal feelings, I have been supposed to refer to ill feelings or spite, but I should not be so foolish as to attempt to describe the feelings of persons that I know, much less the feelings of those that I do not know, and when I wrote my letter, I was not acquainted with the name of a single person who had voted against Mr. Hinton's election. Every one has "personal feelings" towards each of his acquaintances, and my point was that, in voting with regard to the election of a candidate into such a Society, the only question that each voter rightfully has to consider is whether the proposed candidate is fit to be a member of the Society, The election of a member of a social club is entirely different; in that case, personal likes and dislikes may be the only question to be decided.

The secrecy of the voting has been confused with the keeping secret of the candidate's qualifications. It is not necessary to do more than point out this error. There are other comments that will be found answered in my first letter, or in the rules of the Society.

Finally, so far as any one has misunderstood my letter and considers on carefully reading it again that his misunderstanding was my fault, I would offer to him my sincere regrets and apologies in whatever measure he may consider them due to him. I would also tender my thanks to all who have expressed their thanks to me for having publicly set forth the views that they also hold.—I am, yours, &c.,

CHAPMAN JONES.

11, *Eaton-rise, Ealing, W., December* 13, 1894.

To the EDITOR.

SIR,—There is a charm about the letter of "Another old Member" which compels me to rush responsive. I wish I could feel that his flattering epistle had paid the simple tax of a penny stamp to Her Majesty's Government, or even that it had been delivered by hand, but this is a dark saying.

We all hold our farthing candles to the sun, and some are born to do great deeds unknowing. Does "Another old Member" know what great deed he has achieved? Is it the result of studied art, or is it the outcome of happy accident? I should so like to know it was not a snapshot. He has done nothing less than make a bold bid to reproduce the age of gold, when the lion lay down with the lamb (very tired they must have been of each other), and he has done it in an original way.

In the bad old times—before, let us say, the Photographic Society of Great Britain became the Royal Photographic Society of Great Britain—when you had no case, it was a well-practised device to abuse the plaintiff's attorney (forgive the worn-out illustration). "Another old Member" has found a better way, and initiates a more pleasing practice. Not having a leg to stand on in the way of argument when he begins to comment on my letter in the *Amateur Photographer*, he finds it not quite so easy as a first glance promised, and happily, with a sudden stroke of genius, reversing the method of barbarous times, *compliments and praises the other side!*

What can I say, sir, after this? I feel not only bound but delighted to respond to this tenderness, otherwise I should remind him—but I forbear. Neither will I comment on the one or two slips of the pen (I will so call them under the present Arcadian circumstances) which seem to slightly mar the complete felicity of "Another old Member's" delightful communication—

> "You may charge me with murder or want of sense
> (We are all of us weak at times),
> But the slightest approach to a false pretence
> Was never among my crimes!"

Although, as I agree with my friend on this joyful occasion, I have "no sense of logic whatever," may I indulge in a compliment to Mr. Sinclair on being the only one of the blackballers who has had the courage to state definitely the grounds of his action. Further investigation on the basis of his "reasons" will show that the blackballing was a case of impulsive action on conclusions deduced from false premisses, which at least half the blackballers honestly believed. This, I think, must have dawned upon the arch blackballing mind, for I see a disposition in one of your contemporaries to shift ground and formulate other afterthought causes, all of which adds to the gaiety of nations.—I am, yours, &c.,

H. P. ROBINSON.

[Mr. Robinson, in the first paragraph of his good-humoured letter, rashly commits himself to a "dark saying." No other term could so fitly describe the erratic guess he has made at the identity of "Another Old Member." As this is the time of year for riddles, Mr. Robinson may try again. He has our best wishes for success.—ED.]

THE NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

To the EDITOR.

SIR,—I should not have taken the trouble to notice Mr. D. J. O'Neill's letter in your issue of the 14th inst., but there are in it one or two errors which I think it will be desirable to point out.

Whether the paragraph in the report of the transactions of the N. A. P. P. complained of by me in my former letter, was worded with the intention of leading people to believe that that Society had really done something at last worth recording, I cannot say; but this I know, that ninety-nine persons out of one hundred reading that paragraph would be under the impression that the money received by Mr. Whitlock for the infringement of his copyright, had been obtained through the instrumentality of the N. A. P. P. And, therefore, I maintain that I was justified in feeling aggrieved and writing as I did.

In one respect I agree with Mr. O'Neill. Mr. Whitlock's case was "one of exceptional clearness *legally* considered," and I was at first very much annoyed with my colleagues for not taking it up; but, as stated in my former letter, we could not do so, as at *that time* we had no money available for such purposes.

It is easy enough to say that had Mr. Whitlock acted for himself through his own solicitor, the "cash payment would have been greater," &c.; but something transpired at my interview with the proprietors of the *Illustrated London News*, which enables me to confidently affirm, that had it not been for my intervention, all that Mr. Whitlock would have got would have been the proverbial half guinea.

It certainly was not worth Mr. Whitlock's while to come twice to London to see me on the subject, and I admit I was rather too impetuous; and if any one is to blame in the matter it is myself, for not remembering, before expense was incurred, that the Union at that time was not in a position to take action on Mr. Whitlock's behalf.

If Mr. O'Neill will take the trouble to read my letter again, he will find that I never stated that Mr. Whitlock made repeated appeals to the Photographers' Copyright Union to take up his case. What I did say was that Mr. Whitlock made repeated appeals to *me* to negotiate on his behalf with the papers, and which is perfectly true.

If I might be permitted to give Mr. O'Neill a piece of advice, I would caution that gentleman against making public other people's private affairs without previously obtaining their consent, for it must be exceedingly distasteful to Mr. Whitlock to have his private business discussed in the public press.

It is, however, gratifying to be assured by Mr. O'Neill that the Photographers' Copyright Union has his approval, and, as to the flattering thing he says of myself, it is quite encouraging; for, to have the respect of the Secretary to the National Association of Professional Photographers is, indeed, an honour which ought to stimulate me to still greater things, and encourages me to renew my efforts to make the Union a power in the land, notwithstanding the occasional rebuffs it gets, and the lethargy exhibited by some of those whose interests it is intended to benefit.

We have law and justice on our side, and all we now need is for professional photographers generally to join the Photographers' Copyright Union, and so form one great federation, which shall defend our rights and keep up the dignity of the profession.—I am, yours, &c.,

55, *Baker-street, December* 17, 1894. JOSEPH J. ELLIOTT.

[This correspondence here terminates.—ED.]

THE CHRISTMAS HOLIDAYS.

To the EDITOR.

SIR,—We beg to inform you that our office and warehouse will be closed from two o'clock, Saturday, December 22, until nine o'clock on Thursday morning, December 27.—We are, yours, &c.,

L. TRAPP & Co.

1, *Budge-row, Cannon-street, London, E.C., December* 15, 1894.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—Resuming the subject of my letter last week, I wish to place before your readers a statement of the work of the Photographers' Benevolent Association since the beginning of the present year. In that time twelve meetings have been held, at which fifty-nine application have been carefully considered, fourteen applications have been refused, seven deferred for further investigation and report, in thirty-eight cases grants or loans have been made. The total amount granted has been 131*l.* 7*s.* 5*d.*, divided into sixty-seven sums. In several cases the money granted has been expended by the Association, thus securing the advantage of second-hand prices or special discounts to the applicants. In every case most thorough detailed inquiries have been made, and references looked into, and in some cases sub-committees have been appointed to specially examine into the applications. So carefully has the work been conducted, that we believe that very little, if any, of the money has gone to otherwise than perfectly deserving cases. In most instances the grant is likely to be of permanent rather than of mere temporary assistance, and this is a special feature of the Committee's method, for in one or two instances, where a man has repeatedly applied for further assistance, grants have been discontinued immediately the

Committee was convinced that no permanent good was likely to be done.

The expenditure (as above stated) has been roughly 131*l.* 7*s.* 5*d.*, exclusive of the small working expenses, and our income during the same period has only been 41*l.* 6*s.* 10*d.* We think it is only necessary to lay these facts before the photographic public to have a hearty response that will again place our receipts in excess of expenditure. What the Committee has found even more discouraging than the small financial support, has been the very slight interest taken in the Benevolent by those who could be of a personal service to it. Very few, indeed, of the subscribers attend the annual meeting, and, even of those who do, it is difficult to find men who will undertake the work of the Committee, and relieve those who have been carrying it on, in some cases, for a great many years. We trust that the personal interest, as well as the financial support, will distinctly increase. Membership in the Benevolent is secured by a minimum subscription of 2*s.* 6*d.*, and there are few men who cannot afford this or more. We trust, therefore, that we shall have a large accession both to funds and to membership as the result of this appeal.—I am, yours, &c.,

H. Snowden Ward.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatu in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange twenty beautiful lantern slides of great musical composers, from Bach to Offenbach, for good flint-lock pistol or sword.—Address, James Matthews, 175, Blackness-road, Dundee.

Will exchange nine volumes of The British Journal of Photography, 1886 to 1894, three numbers missing, and two volumes of *Photographic News*, 1887 and 1888, two numbers missing, for good-class oil magic lantern.—Address, Fred Hyatt, 21, Park-road, New Brompton, Kent.

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

Photographs Registered:—

Eille Norwood, York.—*One photograph of Eille Norwood.*

John Davis, Lancaster.—*Two portraits of Robert Preston, Esq., Mayor of Lancaster.*

A. E. Stanley, Stroud.—*One photograph of Rodborough Court, with carriage and pair on drive.*

George Watmough Webster, Chester.—*One photograph of Miss Sophine Turner in hunting dress.*

John Kennerell, Wisbech.—*Photographs of James C. and Robert C. C. Aveling Brothers; Robert C. C. Aveling; James C. Aveling.*

Non-Achromatic.—Apply to any wholesale dealer in spectacle goods, such, for instance, as Sharland, Thavies-inn, E.C.

R. O. S.—Some films will keep in "good workable condition for a reasonable time," but it must be confessed that some will not.

L. Harmer.—If you require more information on the process than was given in the paper, you must apply to the gentleman who read it. Comments were given on it a fortnight ago. More will be found in another column.

J. P. S.—Two cells of a Bunsen battery, or a "bichromate battery," will do for steel-facing copper plates. The size of the battery will depend upon that of the plates to be "steeled." Any philosophical instrument maker will supply the battery. The price will, of course, depend upon the size.

R. & Co.—The experience is by no means exceptional with gelatine papers, particularly when the combined toning and fixing bath is employed. A greater permanency may be expected when the toning and fixing are made separate operations, as recommended by some manufacturers of the paper.

Printer (Liverpool).—Curling, when wetted, is not at all an uncommon trouble with some collodio-chloride paper. An immersion in tolerably warm water (as the first washing water) will mitigate the trouble, if it will not entirely avoid it. We are not at all surprised that the results meet with such approbation with your patrons.

F. T. Q.—The thing is such a simple matter that no book is necessary on the subject. Simply match the colour of the print or the negative in ordinary water colours and apply with a sable pencil. If you find any difficulty in doing this, any local photographer will, no doubt, allow one of his assistants to give you a little practical instruction for a trifling fee.

T. Willmore.—As the aspect of the proposed studio cannot be altered, it will be better to have glass on both sides, so that one side may be used in the forenoon, and the other in the afternoon. The proportion of glass may well be curtailed by three feet on either side. By that means it will be more easily controlled, and the studio kept cooler in summer and warmer in winter.

H. W. Goldsmith.—If a doublet lens of six inches focus will not cover a quarter-plate sharply with a stop equal to *f*-16, it must be an inferior instrument. Are you sure that the focussing screen is in accurate register with the dark slides? If not, that may be the source of the evil. See if the image is well and crisply defined on the ground glass. If it is not, it is a proof that the lens is at fault.

Autograph.—We know of no way by which the paper can be securely attached to a zinc plate for the different operations. Why not make a stretching and securing arrangement like that supplied with the apparatus, but on a larger scale, so as to meet your requirements? As paper and gelatine expand in different proportions, there must be a tendency for the material to curl when wetted, hence the necessity for its being well stretched and held firmly while it is being printed from.

Stains.—The stains on the prints are due to the negatives being insufficiently washed in the first instance, then through leaving them in the damp in contact with silver paper the stains arise. To avoid them in future, wash the negatives more completely, varnish them, and keep the printing frames, while the paper is on the negatives, in a dry place. As the title of the work on chemistry is not given, we cannot say where it is published. The publisher's name will be found on the title-page.

J. Curtis writes: "I have a room with glass all round, as a greenhouse, the top corrugated iron, and I want to use it for toning purposes, &c. What formulæ would you advise for a paint to stipple the glass with, so that the light should be non-actinic?"—If the light is to be permanently actinically obscured, stipple the glass over with a mixture of orange chrome and raw sienna, mixed with japanner's gold size. If only occasionally obscured, deep orange cambric blinds will answer.

A. B. (Stranraer).—There are different ways of applying the colour, but a certain degree of skill is required with all, and that is only to be acquired by experience. The brush you have employed is certainly large enough. It is quite impossible in the limited space at our disposal in this column to give any instruction in finishing enlargements that would be of any practical use to beginners. Much time may be saved by getting a few lessons from a practical worker, even if it entails a visit to another town.

Durham.—In all cases where shellac is dissolved in alcohol, there will be a sediment that will not be got into solution. This will be greater with some samples of the resin than with others, and, as a rule, will be greater with bleached lac than with the unbleached. We have, however, seen samples of white lac that would dissolve perfectly, and make a clear solution at once. The opalescent appearance and sediment are in no way due to the use of methylated spirit. The same would be the case with pure alcohol.

W. E. E.—A hand camera may be employed for taking snow scenes; but rapid plates will have to be employed, and a rather long exposure given, as in winter the light is always poor in actinic quality, although it may appear bright. However, with snow scenes fine definition is not such an important matter as it is with most other subjects; the lens may, therefore, be worked with a much larger aperture than would otherwise be permissible. In this way the exposure may be much curtailed without any great detriment to the result.

South Light says: "1. The light of my studio is so situated that I am compelled to diffuse it by using calico strained on frames that fit the window. Hitherto I have used white calico, but am advised that a blue tinge would have better effect. Also same for curtains, reflectors, &c. Is there any chemical or optical reason that blue would act better than white? 2. I have front and back combinations of portrait lens (Petzval). How can I ascertain the most suitable length for tube mount for same as simply as possible?"—1. The only advantage in using blinds, &c., with a blue tint is that the light, being more subdued, is less trying to the eyes of the sitters when it is very bright. With it a little longer exposure will be entailed according to the tint. 2. Only by experiment. Make two tubes of cardboard, so that one will slide tightly in the other, fix one of the lenses at the end of each, and then see at what distance apart they yield the best image.

*** Several Answers, &c, unavoidably held over.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1808. Vol. XLI.—DECEMBER 28, 1894.

GROUND GLASS IN STUDIO CONSTRUCTION.

Much misconception appears to prevail as to the employment of ground glass in the glazing of a portrait studio. We have not unfrequently seen it employed in a way eminently calculated to cause the production of miserably ill-lighted portraits, which were alike unsatisfactory to the public and to the photographer himself; while, on the other hand, we have also seen portraits well lighted, round, replete with vigour and delicate half-tones, which, without the judicious use of ground-glass glazing, could not have been obtained.

It is when the studio is on the ground level, and the light at the sides obstructed by buildings, that the value of ground-glass side windows tells with the greatest effect. The more these obstructive buildings predominate the greater becomes the influence of the top light, and this is hostile to the obtaining of an harmoniously lighted portrait, especially in the case of a sitter having sunk-in eyes or "beetle brows." Let the photographer seat himself in the operating chair, and cast a glance around, and note the extent to which he is lighted by the sky, and where the light becomes cut off by the interposition of, say, some large red-brick building, for all the light that is practically of use in the illumination of the sitter comes from above, and not below the line of union of the building and the sky. Reflecting screens placed inside of the studio will certainly do much towards lighting up the shadows, but they cannot compare with the advantages to be obtained by shutting out all vision of the offending building by ground glass. Trees are equally as bad as stacks of chimneys and brick walls, causing the sitter to be placed near the bottom of a well of non-luminousness.

Ground glass illuminates the sides of this well. The light from above the obstruction, falling upon the ground glass, is by it scattered in every direction, and thus introduces a large volume of light.

We once had occasion to demonstrate this before some friends who were contesting this subject, and the way we did so was to erect a camera having a wide-angle lens, placing it just about where the head of the sitter would be. Having directed the camera towards that side from which the principal side light was expected, a negative was taken, after one vertical pane of ground glass twelve inches wide had been temporarily inserted amongst the plain glass panes already fitted, a very brief exposure having been given. Upon developing, it was seen that all the portion in the line of the brick building, with a solitary tree clad with leaves, was black, or almost so, showing that the sitter, had there been one, would have derived very little light from that, whereas the twelve-inch wide strip of glass which intercepted that portion of the outside view was but little less luminous than the sky, and would have lent most powerful aid in illuminating the sitter. The ground glass when thus used distributes the light that it receives from the sky throughout the studio.

But, wherever the light of the sky falls direct upon the subject, nothing but the clearest glass should be allowed to intervene, for ground glass only causes a degradation of the light when thus placed. The best method of lighting a sitter is, first of all, to have the studio illuminated as strongly as possible, and then control the light by means of blinds, using just so much as is found necessary to impart the desired effect. Were the sun always shining upon the roof, or upon any one side, then might ground glass, or a white diaphanous screen, be advantageously employed to diffuse it, this also being placed under control by more opaque screens.

A fairly good substitute for ground glass may be had by applying a thick coating of starch to the plain glass. It possesses this advantage, that it can be removed, when desired, by a cloth saturated with tepid water.

THE CONVEYANCE OF SMALL PARCELS OF PHOTOGRAPHS.

It has been suggested to us that the valuable information, as some of our readers have characterised it, that we gave a few months ago regarding railway rates might fitly be supplemented by some hints to the inexperienced as to the carriage of negatives and prints. As at the present season these are likely to be more numerous perhaps than at any other, we think the occasion opportune to comply with this suggestion.

It is possible that our remarks may be more useful to those in the provinces than in town; but there is much to be learnt through practical experience by any photographer. Any one who is familiar with the work of the editorial office is aware how many negatives are dispatched with no protection but a piece of card on one or both sides, and placed in an ordinary envelope, treated as a letter, and marked on the outside, "Glass, with care." Now, apart from the fact that a moment's consideration would show the folly of such proceedings, as the inevitable "stamp on the stamp" must lead to

breakage, it ought to be known that glass is expressly prohibited from being sent by Letter Post. Page 23 of the *Postal Guide* says (paragraph 2): ". . . . Glass . . . . may not be sent by any post but the Parcel Post, ... and, if so sent, must be packed with special care." It will now be fully understood that Parcel Post is the only postal means by which negatives legally may, or should be, sent. As to the proper mode of packing, there would not be space here to fully treat that subject alone, and there are many individual preferences on the subject. Using wooden boxes, some prefer sawdust, others bran, tissue paper, pads of newspaper, &c. What is to be done is that every parcel should be packed compactly, free from sound if briskly shaken, and the negative free from uneven pressure. It is advisable to secure the box by string and not nails or screws, and so eliminate the possibility of breakage from jarring. The postage stamps, unless the packing box be of unusual strength and solidity, should never be put upon the box or its paper cover. In the pressure of work the stamp-obliterator cannot differentiate the force of his blows, and where the top of the box is of elastic wood it may easily give sufficiently under the stamp to cause the negative to be broken. The proper mode is to put the stamps on a separate label attached by a piece of twine and hanging loose.

With regard to dispatch by railway, similar care should be taken, though the loose address label is not necessary, if advisable.

If we now turn to the dispatch of *cartes* and cabinets, the staple means of dispatch, it might be said there was little here to learn; but, unhappily, this is not the case, as too many unfortunate photographers and "photographers" have been made painfully aware. Let it be remembered that all letter parcels, from and to the various inland towns, are all packed in strong bags and dispatched to their various localities. In the majority of cases, no harm arises; but very many of the smaller towns receive and dispatch their bags from and to trains which do not stop at the places. A special machine is employed. The mail train, travelling fifty to sixty miles an hour, drops the bag by means of a special contrivance into a wire-net receptacle at the side of the line. Whatever parcel happens to be so situated in the bag as to receive the inevitable violent impact is bound to suffer unless made of something like wooden boards an inch or two thick. We have seen packets tightly made up containing a couple of dozen cabinets broken through every picture at one corner by this force. The only remedy is for the sender to get a list of all the towns in his neighbourhood that have letters dropped by machine to ascertain from his local postmasters the times of dispatch of mails that are not delivered by these means. Another remedy adopted by some photographers is to send all pictures by Parcel Post and so avoid the risk we describe.

When large single pictures are sent, they should be well protected by stout packing boards if sent by Book Post; but it is far better to send as a parcel.

The point that claims our next attention is how to recover damages for parcels or packets sent by rail or post. In the first place, every sender should obtain a receipt from the post for each parcel he sends, without this it is useless applying for compensation. The post-offices will supply the needful forms, and upon presenting them properly filled up will stamp them with the office stamp. Where many are sent, it is customary to have such forms bound up in a book.

The public are informed that the Postmaster-General is not liable to make good any claim arising out of the conveyance of a parcel sent by post, but he will accept the liability under certain conditions. Briefly these are: The above-named certificate of posting must have been obtained, and the value of the parcel must not exceed two pounds, but by registering and paying a fee of from twopence for five pounds, to elevenpence for fifty, the respective amounts are justly claimable.

We may here say that it is difficult, if not impossible, to obtain any compensation for damaged negatives. We presume that so many fictitious damages have been claimed for, that the innocent have to suffer for the guilty, by being refused compensation in case of damage.

Finally, it may be said that the railway companies are liable to the extent of 10*l.* for damages to goods sent by them, and for larger sums if the parcel be insured, which, of late years, may be done at a very cheap rate, 10*s.* per 100*l* being the maximum, photographs being included in the "pictures and paintings" class, at a rate of 5*s.* per 100*l.*

AN ELECTRO-CHEMICAL ETCHING PROCESS.

It is quite twenty years since M. Merget published his method of photo-engraving, based upon the fact that, if a deposit of any of the "noble" metals be formed on the surface of a polished copper or zinc plate, and the latter be immersed in a very weak solution of sulphuric or hydrochloric acid, chemical action takes place only in those portions where the second metal is deposited, with the result that the plate is eaten away, or etched, in those portions. We do not recollect the precise working details of the original process; but, roughly, it may be stated that a plate prepared in any of the usual ways for etching was treated with a suitable solution, by which means a deposit of the desired metal was deposited upon the bare portions. The plate was then immersed in the acid bath, where it remained until a sufficient depth was obtained, the deposited metal sinking into the plate as the latter was eaten away, forming sharp lines or holes of any desired depth.

Later, a process, differing materially in details but based upon the same principle, was suggested, if we remember rightly, by the late J. B. Obernetter, of Munich. In this the deposited metal was applied to the plate to be etched in the form of a photographic image, produced in the camera or by other means, thus dispensing with, at least, one operation. The process consisted in the production of a positive on wet collodion, which, after fixing and washing, was bleached or converted into chloride of silver by any of the usual means. The collodion film was then floated off the glass, and transferred directly to a polished copper plate, to which it was made to adhere closely; and this was then subjected to the action of the weak acid bath, with or without the assistance of a galvanic current.

For pure line work this process worked most satisfactorily, but the chief claim in its favour was that it was applicable to photogravure purposes in half-tone, the corroded surface of the metal forming a sufficient tooth to hold the ink, while the varying qualities of silver forming the gradation of the picture regulated the depth of the etching and the quantity of ink retained by the *cliché*. For some purposes the method answered well, but it is obvious that it was incapable of forming a selective grain, and consequently presented difficulties in securing boldness of result in certain classes of subject. If, however, the collodion image were applied to a plate previously prepared with powdered bitumen, as in the Klic process, or any other method of producing an artificial grain were adopted,

his difficulty was overcome; but this, of course, did away, to ome extent, with the simplicity of the process.

But, in addition to this, there was frequently some difficulty in ecuring sufficient depth, owing probably to the intervention f the collodion film, which, if not of the proper character, revented the free action of the two metals upon one another; nd it was to meet this difficulty that the galvanic current vas called in. In order to obviate the necessity for this latter id, as well as to secure a more pronounced grain without re- orting to artificial means, we some years ago practised a modification of the Obernetter method, which at the present time, when photo-mechanical processes are attracting so much attention, may possibly be worked to a more successful issue than, in our disjointed experiments, we have been able to do, although we may say that, in both respects mentioned above, grain as well as depth, the modification gives superior results to the original plan of Obernetter.

In place of wet collodion we substituted a collodion emulsion of a special preparation, and this was either spread upon paper, instead of glass, or stripped from glass upon gelatinised paper previous to transfer to the copper plate. Those who are conversant with the working of collodion processes will be fully aware that, in order that the film may be strong enough to bear transfer by floating off the glass, as in the Obernetter method, the pyroxyline composing the film must be of a somewhat horny nature; consequently, the particles of silver or silver chloride forming the image are so enclosed in comparatively impervious material as to be, in a great measure, isolated from the copper plate, and so rendered incapable of exercising any action.

The film formed by an emulsion of good quality is known to be of a far more open or porous nature than that of wet collodion, and, for the special purpose under discussion, it can be made more than usually so, while the character of the metallic particles that are to form the active etching agents can be varied and modified to an almost unlimited degree, even to some extent to the formation of a selective grain, that is to say, a coarser grain in the shadows of the picture. But such a porous—or, to use the technical expression, powdery—film will not float off the glass in the same manner as a wet-collodion one, as it has not sufficient cohesion; hence the reason of giving it the assistance of a paper support during the process of transfer.

With a silver image such as we shall presently describe, there will be far less difficulty, if indeed any at all, in securing any reasonable depth of etching with the greatest facility; but, should there be any trouble in this direction, it is overcome in either of the following ways. It will be remarked that the Obernetter etching process differs from that of Merget, inasmuch as, in the former, the silver is present in the form of chloride, and the commencement of the biting process is performed by the reduction of the haloid to the metallic state and the action of the evolved chlorine upon the copper. In the Merget process, it is the direct electro-chemical action of the two metals that performs the work, but in the Obernetter the insulating action of the collodion film greatly retards, if it does not altogether arrest, this action, and, when the chloride of silver is reduced, the process comes practically to a standstill.

Our first method of overcoming this difficulty was by means of a series of successive bitings, the chloride after reduction being reconverted into chloride, and again reduced as many times as might be requisite. For this purpose it is only necessary, when the silver has been completely reduced, to immerse the plate in a solution of cupric chloride, which reconverts the silver into chloride without exercising any action upon the copper plate, and, on again removing the latter to the feeble acid bath, the reduction occurs once more. In this manner the process can be carried to an almost unlimited extent if the original film be not disturbed, though we doubt whether the silver-bearing collodion film is capable of sinking as deeply into the copper as the loose metal in the Merget process; but, at least, it is capable of acting to a more than sufficient depth for all practical purposes.

Instead, however, of making the process an alternate one of reduction and restoration, it may be much simplified by being made continuous; this is easily done, rendering the bath of cupric chloride faintly acid, instead of using the separate acid bath, and under these conditions the etching seems to proceed more rapidly, as well as more satisfactorily.

The following is a brief description of the details of the process, as we have worked it most successfully: A collodion emulsion is made in the ordinary manner, and preferably washed; but for the purpose in question we require an emulsion rich in silver, but containing as small a quantity as possible of pyroxyline, and that of the most powdery description. It is possible, although it is a very difficult and delicate business, to form and wash an emulsion containing as little as two grains of pyroxyline to the ounce, but it is scarcely possible at the same time to load it with the requisite proportion of silver.

To secure the desired result, then, we must resort to other means, and these are the methods we have adopted: An ordinary washed emulsion is made as already directed, redissolved, and carefully filtered. It is then set aside for some days, or it may require even weeks, until the silver bromide has subsided to such an extent that two-thirds or so of the liquid have become clear, or nearly so. The clear portion is then very carefully decanted, and replaced by an equal volume of a mixture of ether and alcohol, and the whole well shaken up until the bromide is again equally diffused, when we shall have an emulsion containing only about two grains of cotton to the ounce, with a full quantity of silver. The larger preponderance of the latter, of course, aids in increasing the porosity of the film and removing the insulating action of the cotton.

In order to introduce variety in the size of grain, bromide of silver precipitated from viscous solutions of gum, glycerine, and similar substances—of course in the dark, and subsequently washed in alcohol—may be further added to the emulsion. The degees of coarseness may be varied by correspondingly modifying the degree of viscidity or the suspending power of the solution, but the point of distinct granularity should not be reached.

To use the emulsion, it is spread upon paper previously coated with a thin film of perfectly soluble gelatine and dried in the ordinary way. In this condition it is particularly convenient for use in the printing frame, and should be used preferably by artificial light, as it will be too sensitive for daylight. If an artificial grain is required, a film screen may be interposed.

After exposure, development, and fixing, the tissue is well washed and squeegeed on to the copper plate previously thoroughly cleaned. In the hands of a careful worker, it will be better to remove the supporting paper at this stage by means of hot water, but this task should only be undertaken

with a full sense of its delicacy. The removal of the paper is easy enough, but it must be borne in mind that there is nothing to cause the collodion film to adhere to the polished copper surface except suction, and that the slightest roughness in handling will cause it to shift. In earlier trials, it will therefore be better to leave the paper *in situ*, and to allow a longer time for action. The paper will, of course, then have the effect of keeping the collodion film—or rather the silver image—in proper position, and, by carefully passing a squeegee over it at intervals, the etching film may be pressed down into the hollows of the plate as it is bitten away.

There would be no reason for the removal of the paper if it were not for the intervening film of gelatine, which retards the action of the copper solution to some extent. If a sufficiently smooth-surfaced paper can be obtained, the gelatine coating may be omitted; but such papers are, as a rule, quite as impermeable as would be the gelatine-coated.

If the paper is stripped away, in its place should be carefully laid a sheet of pure and smooth-surfaced bibulous paper, and over this several thicknesses more of the same material, which should be kept well saturated with the copper solution. Occasional pressure will help to keep the etching film in contact with the surface to be acted upon.

Experience alone can teach when the action of the etching fluid is complete, and here we leave the process in our readers' hands.

PRINTING PLATES AND RELIEFS BY CAMERA EXPOSURE.

Last week it was mentioned that any practical method by which printing matrices, relief or intaglio, could be produced by direct exposure in the camera, and thus avoid additional operations, would be of great value commercially. Now, there are processes that nearly or quite fulfil those conditions, and they may be worthy of the attention of experimentalists. For example, there is Fizeau's engraving process, in which the camera image is etched direct into the plate.

In that method a Daguerreotype picture is first taken in the camera. Then the plate is etched with suitable mordants, and in the end an intaglio plate is obtained, from which impressions may be produced by the ordinary process of copper-plate printing. The prints obtained from plates so produced many years ago were really very good indeed, and very closely resembled aquatint pictures in appearance. This method of Fizeau's is still not by any means, even now, unworthy of the consideration of experimentalists, inasmuch as it is a means by which a printing plate is produced by direct exposure in the camera without any intermediate operations.

Nicephore Niépce, something like eighty years ago, produced etched plates by the bitumen process, presumably by exposure in the camera, as at that time photographic negatives were unknown. It is needless, however, to say that this method—although bitumen can be made much more sensitive now than it was at the time referred to—is practically useless in the camera, owing to the prolonged exposure that would be entailed.

Mr. Warnerke's process, as demonstrated by him, though not in this particular direction, at a recent meeting of the Royal Photographic Society of Great Britain, enables us to obtain very good images, in relief, by direct exposure in the camera that can afterwards be moulded from. This process, as we explained in our last issue, is based upon the fact that a gelatino-bromide film, after exposure and development, preferably with pyrogallic acid, becomes insoluble in warm water in proportion to the light's action. Hence it can be further developed by treatment with hot water, as a carbon print is developed, so that, in the end, a relief is obtained similar to those usually made with bichromated gelatine. The advantage to be gained by this system is that only the same exposure, or perhaps a little more, is necessary than in taking an ordinary negative, when, perhaps, under adverse conditions of light, many hours would be required with a bichromated film.

As explained last week, the second development must be effected from the side opposite to that which has received the exposure. To accomplish this in carbon printing, and also in the method demonstrated by Mr. Warnerke, the print, after exposure, is mounted on another support for development. But in the present case this may be avoided if the gelatine plates be exposed in the camera through the glass. Then after the image is developed with the pyro—the exposure being made through the plate will make but little difference in the development if it be judged as it proceeds entirely by transmitted light—if the plate be treated with warm water, the unacted-upon gelatine will be dissolved away just as if it were a bichromated film. It goes without saying that the film must be free from alum, or similar substance, and the gelatine of a tolerably soluble variety, conditions that seldom exist in commercial plates. However, special plates fulfilling these conditions are readily prepared; hence it will be seen we have a ready means of obtaining a gelatine relief by direct exposure in the camera.

Here is another method by which a relief, that may be moulded from in different ways, is obtained with a camera exposure, which differs from the last, though it is based upon the same principle, namely, that an exposed bromide film, after development with pyrogallic acid, becomes analogous in its behaviour to one of bichromated gelatine. In this process the unaffected film, instead of being dissolved away by hot water, is simply expanded, as in what is known as the swelled gelatine process. The method is this. A gelatino-bromide plate is exposed in the camera in the usual way. It is then developed with pyro, and fixed in the ordinary manner. It is then made surface-dry and subjected to heat, though not sufficient to cause a dissolution of the film, when the unacted-upon portions of the gelatine will swell and stand in more or less relief. Such a plate can then be moulded from in various ways.

This process was invented and patented by Mr. J. W. Swan, some fifteen years ago, for the expeditious production of typographic blocks, the exposure of the negative being made through suitable ruled screens, and the reliefs moulded or electrotyped from. Several years later, it may be mentioned, this invention was repatented, and eventually a limited company, or syndicate, was formed to work it, but we have heard but little of it of late. In this method we have a means of obtaining reliefs direct by camera exposure, and it ought to prove of value when expedition is a consideration.

In the foregoing we have merely directed the attention of experimentalists to practical methods already in existence by which printing plates, and reliefs for the production of others, can be produced direct in the camera. Those methods will, doubtless, be added to, and further improved upon, in the near future.

The Royal Photographic Society.—Considerably over a hundred members have joined the Society in about three months. At this rate of progression, which we hope will long be maintained, the income will soon attain such proportions as to admit of new and more suitable premises being taken, as well as of allowing the Society to widen its sphere of usefulness in many other directions. Our readers will be pleased to know that the late Exhibition was, financially speaking, the most successful yet held.

The Medal Harvest.—We drew attention a few weeks ago to the plentiful supply of medals placed at the disposal of aspiring photographers by some half-a-dozen London societies during the months of November and December. The calculations in Mr. Welford's letter of December 14, in connexion with the same subject, are interesting and eloquent, and back up with surprising emphasis our old contention that medals are too plentiful, too cheap. Thus, at the five open exhibitions he names, one competitor out of each six, roughly speaking, obtained a medal, a total of eighty-six medals being distributed among 496 competitors. Fewer classes would mean fewer medals, so that the honour of victory, under such a set of circumstances, would be doubly enhanced. Fewer classes, therefore, let us have, as a step towards blighting the aspirations and opportunities of the covetous medal-hunter.

Unfixed Silver in Albumen Prints.—Mr. Haddon's paper (p. 788), *On the Cause of the Fading of Albumen Prints*, is a valuable addition to our knowledge, which comes, perhaps, a little too late to arouse the interest and attention it deserves. That it sets at rest the broad question why albumen prints fade is hardly to be conceded, because fugacity is, as we all know, by no means a certain characteristic of all prints made by this method. But that every print prepared contains in itself the material which, under given circumstances, will hasten its own disintegration, may be easily conceived of from Mr. Haddon's experiments. These all come down to the interesting fact that the whites of a print contain sufficient unfixable silver salt to admit, when chlorised and treated with a body like potassium nitrite, of a vigorous print being made thereon. Still notwithstanding the fatal five per cent. of unfixable silver salt and other drawbacks, it is astonishing to note how many still cling to the use of albumen paper.

The Benevolent Association.—The position of this institution has been brought before the photographic world at a timely moment. It seems, from the statements of the Hon. Secretary, that, while during the past year the activity of the Committee in relieving cases of distress has shown no diminution in comparison with the work of relief of former years, a lamentable falling off in support and subscriptions on the part of the photographic public has taken place, so that, if the good work is to continue, it is imperative either that the reserve fund be drawn on, or that the reflow of subscriptions should set in. We sincerely trust that the former alternative will not have to be chosen, and that financial help will come from far and wide for an excellent and deserving institution that has done a large amount of real good in the past. It would be a thousand pities to allow the Benevolent to flicker out of existence, for the time would surely come when it would be sadly missed by many photographers who had the misfortune to fall on evil times and knew not where to turn for a helping hand. The minimum subscription to the Association is half-a-crown a year; it is open to all, and the name and address of the Hon. Secretary is Mr. H. Snowden Ward, 6, Farringdon-avenue, E.C.

THE ALLEGED ACTION OF POTASSIUM BICHROMATE ON THE DEVELOPED IMAGE.

SINCE the published description of Mr. E. Howard Farmer's *Photographic Wedding* and your subsequent leaders on the subject, I have made a considerable number of experiments which, together with Mr. Warnerke's recent demonstration of his process before the Royal Photographic Society, tend more and more to disprove the existence of the alleged action of potassium bichromate in rendering insoluble the gelatine in the exposed portion of a photographic film. As was pointed out in your articles, and as Mr. Warnerke has since publicly shown, the effect is produced entirely without the aid of bichromate, and it seems to be ignorance of the principle discovered by Mr. Warnerke some dozen or more years since that has given rise to the idea that bichromate is the acting agent.

Mr. Farmer has, however, added one more fact to those already known which seems likely to prove equally, if not more useful, than the earlier discovery of Mr. Warnerke. The latter gentleman attributed the insolubilising action upon the gelatine to the combined action of light and development, if I remember rightly, but it would perhaps have been more strictly accurate to describe it as the combined action of the developer and the reduction of the silver salts. Mr. Farmer in his paper, however, pointed out that it is immaterial whether the silver image is produced by development or by direct reduction or "printing out," and this I have been fully able to corroborate, though the degree of solubility is less in the latter case than when development, especially with pyro, is adopted. It seems likely, therefore, that Mr. Warnerke was correct in attributing at least a portion of the effect to the tanning action of the pyro.

You alluded in your first article to the inutility of attempting this process with the ordinary commercial films—at least, such as are prepared for development purposes—owing to their being already rendered practically insoluble by the free use of alum and other agents; but I find a reservation can be made in favour of "printing-out" films, which, as I shall show, are perfectly amenable to the treatment. At the period of Mr. Warnerke's first publication of his process, matters were, to some extent, different, as the negative films of that day were of a much softer nature than they are now, the use of alum and of "hard" gelatine having scarcely come into vogue; indeed, many of the leading workers, both experimental and commercial, were still using Nelson's "No. 1 photographic" gelatine, which, as all know, is one of the most soluble known. With ordinary negative plates, made from such gelatines, I at the period named, made very passable negatives by exposing the reverse side of the plate in the camera, and, after development, treating the plate with hot water, by which means the gelatine and unreduced silver bromide were washed away, and an image left on which the shadows were represented by literally "bare" glass, and the high lights and half-tones by varying thicknesses of gelatine and silver. It may be remarked, *en passant*, that such an image, where great density is required, is capable of intensification by a further and prolonged application of the developer, which reduces any bromide of silver still remaining in the insoluble film.

To come to my recent experiments, the most important of these have been in connexion with the undeveloped or "printed-out" image, and have been made with the ordinary commercial "glossy" papers, though, no doubt, the more newly introduced "matt"-surface paper would answer equally well. Indeed, I am fully aware that the Obernetter gelatino-chloride, which was one of the, if not the, first introduced into this country, and which was a comparatively matt surface, inasmuch as the emulsion was spread upon the paper itself without any previous enamel coating, was perfectly soluble, and well suited for any of the purposes to which the Warnerke process is applicable.

The first simple experiment, which any one may try, is to take a gelatino-chloride print, just as it comes from the printing-frame, and soak it for a few minutes in cold water, just as if it were to be toned Then immerse it, face uppermost, in a dish or saucer of warm water, and allow it to soak there for a short time. The temperature should not be too high—say, from 100° to 110°, or about the same as employed for carbon printing; if much higher than this, the whole image will be rapidly dissolved, and the experiment spoilt. When the print has been soaking in the warm water for a minute or two, gently rock the saucer, when, unless the water is at too low a temperature to melt the gelatine, signs of dissolution of the image will appear. Now, rocking very gently, carefully watch the picture, when light milky clouds of silver chloride will come away, while the shadows and half-tones will detach themselves as a *thin*

film, and finally break away in brown flakes, the film of gelatine containing the silver being too attenuated to hold together long.

If a piece of sensitive paper be printed very deeply under an opaque mask, so as to form a sharp line, and then treated in this manner, the insolubilising action of the reduced silver is shown in a very marked manner, as with careful handling the exposed portion will float off in one piece. Nothing could demonstrate more distinctly the fact that, in order to set up a state of insolubility, bichromate is quite unnecessary, and, so far as I have been able to ascertain, by treating portions only of a print with bichromate before immersion in the hot water, *not the slightest difference in result* is produced.

The degree of insolubility produced in a print of the ordinary depth on commercial positive paper is not sufficient to enable the image to withstand very hot water, under which treatment it quickly washes away in flakes, and eventually entirely dissolves; but, when the printing is carried to a great depth—a thicker and harder film is obtained which is capable of withstanding a much higher temperature, in which respect the circumstances are identical with those of carbon printing.

A more elegant experiment still consists in squeegeeing an exposed print, after well moistening in cold water, into contact with a waxed glass plate or a piece of flexible support, when it will be found to behave in precisely the same manner as a piece of exposed carbon tissue or of gelatine paper, prepared and developed *à la* Warnerke. An even better result with the delicate films of the commercial paper is obtained by using autotype final support or transfer paper, though here, were it not for the experiment already quoted, it might be claimed that the action was partly due to the chrome alum contained in the adhesive surface. That such is not the case, however, I am convinced from other reasons, the more perfect transfer arising simply from the greater adhesive power of the transfer paper upon the delicate image.

In many other ways the behaviour of the gelatino-silver papers resembles that of carbon tissue. I already alluded to the greater hardness and capacity for withstanding hot water that the well-exposed image presents, but it is also, like over-exposed or partly insoluble carbon tissue, far more difficult to separate from its temporary support, that is, the original paper. In such cases a longer soaking in the hot water must be allowed before attempting to strip it, and probably warmer water is desirable, otherwise the heavier shadows will be torn away and remain on the original paper, the hot water not having had time to penetrate and soften or dissolve the underlying soluble gelatine. It is possible, in fact—nay, easy enough, with the thin commercial films—to render the whole thickness of the gelatine film insoluble, and so attach it completely to the insoluble enamel surface of its original support.

So far I have spoken only of untoned prints, but obviously the same process may be followed with toned prints, provided they are not alumed or submitted to any treatment calculated to harden the gelatine. Here it may be at once pointed out that the "combined bath," so much discussed at the present time, is quite out of court owing to its very powerful hardening action, while, on the other hand, the sulphocyanide bath may be expected to conduce to ease and readiness of transfer.

Whether this process is likely to possess any practical value for merely artistic purposes I do not at present intend to discuss, though I may remark that, some months ago, I was informed by a friend that he was in the habit of making lantern slides by transferring gelatino-chloride prints to glass in the same manner as a carbon print. I gave little heed to the matter at the time, but I have now little doubt but that this is the method adopted, and in a similar manner I have no doubt perfect opal pictures may be made without the trouble involved in printing out on the opal itself.

For photo-mechanical purposes, however, the printing-out method seems to me likely to prove not only easier in manipulation and more convenient for use, but also to give more perfect results than the development process of Mr. Warnerke, special tissue being, of course, prepared for the purpose. For very fine work in conjunction with the ruled screen, the spreading action of the developer in the film seems calculated to militate against delicacy of result, whereas in printing out, the finest opaque lines of the original, if really opaque, will be rendered as clearly as if cut with the graver.

On a subsequent occasion I may return to the subject of this and other phases of the subject, with special reference to the alleged action of bichromate, which, so far, I have been unable to recognise.

W. B. Bolton.

THE STEREOSCOPE AND "ART."

Just as the stereoscope was reviving as a popular instrument and the making of stereoscopic slides advocated as a pleasant recreation and charming means of entertainment to one's friends, the market was all at once flooded with indifferent, if not rubbishing, stereoscopes and so-called pictures. Unfortunately, the latter are, in the majority of cases, largely composed of subjects even worse in character than the old "comics," which were mainly instrumental in sending the stereoscope out of fashion; in fact, from the class of samples recently submitted to opticians for purchase, they appeal to the worst passions. If these slides were artistic or classical and the sale restricted to those who were studying art, some excuse might be found for the publication; but, when they are mainly of the most suggestive nature, if not lewd and indecent, it is time, in the interest of photography as a profession, that some controlling power should be able to check their public exhibition. That it is possible in main and populous thoroughfares to see exposed in the window stereoscopic slides (and, for the matter of that, cabinet photographs as well) that are a disgrace to the art can be proved by any one that looks for himself, and chooses to inquire into the matter; but, when one enters the shops, to find out if the stock contains redeeming works or pictures, one is still further shocked to find not only the most extravagant and eccentric subjects, but also the most suggestively indecent. However clever it may be for a lady dancer to be able to lift her foot when dancing on a level with her head, and otherwise pirouette with a freedom of limb that is astonishing, when seen visually, seldom anything but grace of movement is the result; but, when a photograph is taken of such a dancer in a fixed attitude, the good taste is very questionable. Extending these remarks further with special reference to stereoscopic slides of this class, the subjects in some cases are so decidedly bad that they ought never to see the light of day.

Of course, I know, as every one else does that has moved about the world with his eyes open, that there have always been photographs procurable that should never have been published or sold; but what I have forcibly in my mind now is the boldness of some publishers in offering to respectable shopkeepers this class of subject, and the paucity of really good views or artistic productions procureable in the way of card stereoscopic slide. In this condemnation must not be included, of course, the beautiful pictures published in such large numbers on glass by Levy & Lachanel, of Paris, Valentine, Wilson, & King, of Scotland and England, and which I am pleased to notice are reduced to a more popular price, or the fine series of London published by York & Son.

Then, as regards the instruments, they are, in the majority of cases, sold at such a price that precludes the possibility of their being properly constructed except by the merest chance. That the stereoscopic revival for high-class instruments has not extended to London seems to be the case, as far as I can learn from London opticians, although in isolated cases a revolving stereoscope or good hand instrument is now and then sold; but I believe that, if the tone of the slides was upheld, and only good instruments and pictures published, the revival would soon be an accomplished fact, not only in one section of England, but throughout the United Kingdom. I have seen the pleasure given young and old alike at *soirées* and social gatherings where a good revolving stereoscope and transparencies have been on view, in fact I have never found it fail to "catch on." With stereoscopic hand cameras and portable cameras capable of taking good stereoscopic pictures coming to the front in fair numbers, and amateurs able to produce their own slides at a moderate cost, it ought not to be long before the stereoscopic mania has a good hold in every society, and a class provided for it and *encouraged* at the various Exhibitions. The preponderating influence of the good would then soon blot out the bad in stereoscopic work as daylight dispels darkness.

G. R. Baker.

A POINT IN CONNEXION WITH PLATE-COATING.

[London and Provincial Photographic Association.]

The literature of the manufacture of gelatine emulsions is a very voluminous one, and that the most useful part of that literature has for its origin in no small degree the London and Provincial Photo-

graphic Association is a matter upon which we may very justly feel proud. That literature came to a very abrupt termination somewhere about 1884, when it began to be generally realised how much more convenient and reliable it was to buy ready-sensitised plates. With the large increase in the dry-plate industry, almost the only experimenters in emulsions were to be found engaged commercially, and it was only to be expected that, however willing they might be to assist an amateur experimentalist, they would hardly place the experience gained with their time, labour, and money at the disposal of their trade rivals, and consequently at that point we find the published information on the subject grow very meagre.

About five or six years after the time alluded to, Messrs. Hurter & Driffield published the account of their experiments upon the measurement of the speed of photographic films, which had resulted in the evolution of a method and the necessary instruments for carrying out the same; and their method, I think I am justified in saying, is gradually working its way among plate-makers. Without expressing any opinion upon their system of *speed measurements*—not that I do not possess one, but that it is not to the point at present—I feel bound to say that the photometer employed as they recommend has put, if not a new, a hitherto entirely unused power in the hands of every one experimenting in plate making. Compared with previous methods, the only simile that occurs to me as conveying anything like the real advance made by them is the measurement of temperatures with the hand and with the thermometer. I mean these remarks to apply to the employment of the photometer to comparative emulsion experiments, and without reference to any unit of sensitiveness or method of exposure calculation. Recognising this advance, then, which has been made since since the publication of nearly every useful detail of emulsion-making, a very large field of useful work opens up to the experimenter in comparing the published results of different modifications, &c., to be found in this ancient literature, with what we are informed those results actually are by the much more delicate instrument now at our disposal.

I must apologise for this prologue, but it is my defence for daring to appear before the London and Provincial Photographic Association without anything very novel to communicate, for what I have to lay before you to-night is simply a confirmation, by means of the photometer, of something which I believe has been long known.

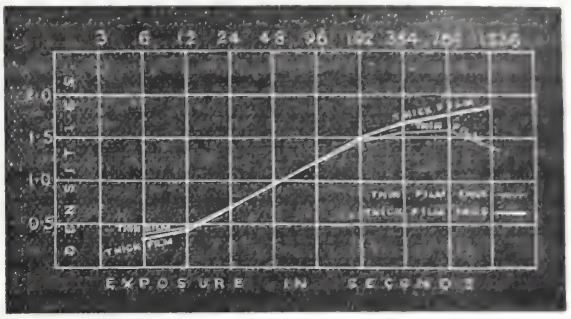
My experiments have been made to determine the difference caused by varying the thickness of the coating of emulsion on the plate, and have been performed as follows: With a certain emulsion a number of plates were coated as thinly as was practicable consistently with securing a fairly uniform coating, and a number with as thick a coating as was in reason possible. Strips cut from both lots of plates were exposed together, developed in the same dish (ferrous oxalate being employed), and their densities measured. The table gives the average results obtained of a number of exposures.

Units of Light.	Density of Thin Films.	Density of Thick Films.
6	·31	·26
12	·41	·40
24	·685	·67
48	·98	·99
96	1·22	1·25
192	1·47	1·50
384	1·51	1·68
768	1·55	1·74
1536	1·39	1·85

The curve shows these results expressed graphically, and is, I think, self-explanatory. I prefer to speak of units of light to C. M. S., as I cannot rely upon my standard *as a standard*, but, the plates being exposed simultaneously, any variation in the light has affected all.

It will be seen that, even when so great a difference in the thickness of the coating has existed as that in these experiments—I pass round pieces of two of the plates measured which will speak for themselves—there is a range of luminosities in the reproduction of which the thinner plate is not markedly inferior to the other of from 6 to 192, that is to say, from 1 to 32. While, however, the thin plate may be considered as registering correctly from 1 to 32, the thicker one registers up to nearly 768 units, or from 1 to 128, that is, it allows four times the latitude in exposure that the other does. At the same time reversal has been delayed, as will be seen, very considerably. This is, of course, an extreme case; there is certainly more than four times as much silver in the one plate as in the other. (I pass round also some negatives made with both sorts of plates, they have had identical treatment throughout, and show the utility of a thick coating of emulsion in preventing halation) they also show the advisability of buying your plates when you do not wish to be troubled with dust, air bubbles, &c.)

I want more particularly to point out that, while the thicker plates



have the very marked advantage to which I have just alluded, it was a very surprising fact to me that the thin films, which are far away thinner than anything I have yet met with in the market, should yet be capable of reproducing such a long scale of gradations properly, and I should be inclined to believe, from these experiments, that we are apt to over-estimate the importance of an extremely thick coating of emulsion; but that is a point upon which I shall be glad to have the opinion of some of those present who are better qualified to judge.

When I first gave the title of this paper to the Secretary, I had intended not only to deal with varying thicknesses of the same emulsion, but with equal thicknesses of different emulsions, and have made some few experiments in this direction; but, as I have not been able to bring these into a sufficiently definite shape to lay before you, I must defer doing so until the occasion of the reading of the second paper, to which I so rashly committed myself.

R. Child Bayley.

HAND WORK ON NEGATIVES.

A very divided opinion exists as to whether hand work should be permissible in *any degree* on negatives from which it is intended to produce prints for Exhibition purposes, or any other, for the matter of that. I have an opinion that cleverly applied hand work, within reasonable bounds, would be utterly and entirely undiscoverable on a well-made print by the most careful examination of a skilled expert, which would prove that, at any rate, such hand work did not *damage* the picture, leaving the matter of improvement an open question.

In the first place, a hard-and-fast rule cannot be applied to all kinds of photographs. The fact of improving some photographs, from a pictorial point of view, would entirely ruin their value from another. The merest touch would be dangerous on a subject such as the copy of a supposed forged document, or anything of a similar character where absolute truthfulness, as represented by the action of light through a lens on a sensitive plate, is chosen to determine some unknown quantity. But, with regard to photographs whose chief claims to distinction rest on their art qualities combined with good technical work, a little judicious touching up is, in my opinion, a great advantage. Very few negatives are made that cannot be improved by hand work of some kind or another. A negative may be as absolutely perfect as clever manipulation can make it, yet, owing to some local colour or shadow, a portion may be less brilliant than it seemed in reality, and which deficiency in sparkle can be restored by a touch or two of pencil or colour. What objection can be fairly raised to its being done? No falsification is introduced, and the picture is improved in its artistic qualities. Yet many find fault, and condemn the picture because of hand work they possibly might not have the skill to apply themselves. My advice is, that photographers should improve their negatives by *any* means in their power, so long as they add beauty to their work.

There is no doubt but that a little suppression, or a little addition, or both, to the normal image will considerably alter the pictorial effect at whatever stage it is made. It may be to the negative or it may be to the print, by masking, shading, or tinting in the various well-known ways. If *anything* at all is done to make the negative print differently to its normal powers, it, so to say, falsifies the result

just as much as few or many touches on the surface of the prints itself. Yet all this is considered legitimate, and no one would think of disparaging the results by whatsoever ingenious and intricate proceeding it had been attained; it is simply "hands off" as far as the negative is concerned "straining at a gnat and swallowing a camel." The go-as-you-please style adopted by the Linked Ring is a move in the right direction, although some of the exhibitors run to extremes; it is the concession to use processes or rather dodges openly that have been hitherto adopted with fear and trembling and a sneaking terror of being found out. It is the permission to make the best pictures you can from your negatives, irrespective of the means, that merits approbation. It is not, as far as I can see, holding out a premium for bad manipulation, as the best pictures artistically are usually the best photographically, and some exhibits shown in that Salon display are simply gems of delicate treatment, and the hand work, *if* present, has not done more than help the photographer, which is as it should be. All the restrictions possible to make will never prevent "hand work"—a term of extreme elasticity—in some form or other, when such is indicated as an improvement.

Because it is not noticeable on the print, there is no guarantee by any means that it is not there; the more skilfully it is done, the less it will challenge attention, and *vice versâ*. I will go a little further, and say, if we wish to idealise a composition, we cannot succeed without "hand work" of some kind or another, on either negative or print. So long as the print is altered from a mere dry record of sharply defined actual facts, whether by fuzziness or any other dodge supposed to enhance its pictorial qualities, that print has, to all intents and purposes, been subjected to hand work, and, for the life of me, I cannot understand why one particular plan should be tabooed and another smiled on, when both are practically aimed at effecting the same alteration, and that, the improvement of the work

I believe the feeling against "hand work" was originally engendered by the impression that it would deteriorate photography if permitted to go unchallenged, also that those who were unable to do it were at a considerable disadvantage when competing with others who could. It is time both ideas were dismissed, the time has passed for this sort of thing, we have other men and other manners. Photography technically is as good as it is ever likely to be, and improvement can only take place in an artistic direction. We know enough now as to purely photographic possibilities, and, if they can in any way be helped forward by hand work, by all means let them be so, for the best artist will undoubtedly make the best pictures.

EDWARD DUNMORE.

PHOTO-CHEMICAL NOTES.

AN INORGANIC DEVELOPER.

IT is a somewhat remarkable fact that, with the exception of the little-employed hydroxylamine, all the developers of gelatine plates are organic bodies. Scarcely any inorganic compound would seem to possess that delicate balance of reducing properties which constitutes a substance a photographic developer. It is therefore interesting to note that a French chemist—Mons. G. A. Le Roy—in a paper in the *Comptes Rendus* states that aqueous solutions of the alkaline peroxides may be employed for the development of gelatine chloride or bromide plates. It is right to state at once that the developing power of this solution is so far inferior to that of the usual developing agents as to necessitate a prolongation of the time of exposure, and it further appears that the developed image loses somewhat of its intensity on fixation of the plate, a result due to the fact that the image does not consist entirely of metallic silver, loosely or otherwise combined with gelatine, but contains a certain proportion of oxide of silver, which undergoes solution in the fixing fluid. The main interest, however, attaching to these results lies in the fact that sodium peroxide should possess any developing capacity at all, and it is only necessary to recall the properties of its parent substance, hydrogen dioxide or hydroxyl, to perceive that this capacity has a certain significant bearing on the whole question of the composition of the product of the action of light on the silver haloids.

Hydroxyl, or H_2O_2, will be remembered as reacting chemically in two entirely different ways. It is commonly a powerful oxidising agent, of which function its conversion of lead sulphide into lead sulphate may be cited as an example. In the presence, however, of compounds containing weakly combined oxygen—such a compound, for instance, as oxide of silver—it acts as an energetic reducing agent, and in the example just mentioned, converts the oxide into metallic silver with evolution of oxygen gas. The formation of oxygen gas is the key to the reaction. The strong affinity of the atoms of oxygen for each other is able to overcome the somewhat weak combination existing between the oxygen atom and the other element in the respective reacting compounds. Hence it may be stated that those bodies reducible by hydrogen peroxide contain oxygen in a more or less weak state of combination. It has long been thought that the product of the action of light on silver chloride contained such combined oxygen, that this product consisted of an oxychloride, and not of a subchloride. The experiments of Abney, Baker, Hodgkinson, and Richardson support this view, and it will be seen that the developing capacity of such a substance as peroxide of sodium is another link in the chain of evidence. The reaction between sodium peroxide and bromide or chloride of silver, which has been exposed to light, offers a promising field for research.

MERCURIC CHLORIDE SOLUTION.

Mons. E. Burcker, who has made a study of the decomposition undergone by bichloride of mercury when in dilute solution, publishes his results in a paper in the *Comptes Rendus*. Although made with dilute solutions, it may be presumed that the same changes go on to a lesser extent in the concentrated solutions employed by photographers for intensification, and no doubt account for some of its anomalies so frequently met with in that process. The author finds that solution of mercuric chloride made in ordinary water undergoes a gradual decomposition, due to the simultaneous action of light, air, and the inorganic and organic impurities present in the water. In the dark, these decompositions do not take place, nor do they do so if distilled water be employed for solution of the mercury salt. The moral to photographers requires no pointing.

G. E. BROWN, A.I.C.

A SIMPLIFIED FORM AND IMPROVED TYPE OF PHOTOGRAPHIC LENS.

[Royal Photographic Society.]

Two or three months ago, your Hon. Secretary, who, as you well know, takes a keen and active interest in all things relating to photographic lenses and photographic optics, very kindly invited me to bring before this Society a brief account of the construction and performance of a new form of lens recently invented by me, and practically worked out by means of the appliances at my disposal in the workshops of Messrs. T. Cooke & Sons. It is well known to many of you that the most substantial recent improvements in photographic lenses have essentially depended upon the production, or I may even say creation, by the world-renowned firm of Herren Schott & Genossen, Jena, of two novel sorts of optical glass, the one being a baryta crown, which combines an index of refraction as high as that of flint glass, with a remarkably low dispersive power, and the other a sort of crown glass combining the index of refraction of ordinary crown or plate glass with a relatively high dispersive power. Some ingenious German opticians and scientific men were not slow to foresee and utilise the advantages set before them in these new sorts of glass, and the outcome of their labours are now embodied in the anastigmat lenses of Zeiss and Goertz. It may, therefore, somewhat surprise some when I say that the new lenses which I am to introduce to you to-night do not at all essentially depend upon the production of these new sorts of optical glass, and the principle involved in my invention might have been discovered and applied in practice as long as twenty years ago, although I will say that the greater variety of optical glass now at the optician's disposal renders possible a greater variety of form in lenses on this principle, and greater ease, perhaps, in working them out.

Some two or three years ago, my studies in optics led me to the conclusion that the mathematical formulæ dealing with the passage of a pencil of rays obliquely through lenses, as worked out by those few mathematicians, such as Sir George Airy and Dr. Coddington, who had turned their attention to the much-neglected science of optics, were, in their final form, exceedingly mixed up, and difficult to practically apply, and this led me to enter into a mathematical investigation on my own account, on, in some important respects, quite different lines to those before pursued. I was thus led to formulæ which I saw at once had an important bearing upon the best form of telescope object-glass, but it was not until some time after that there occurred to me, like a flash, in the course of allowing my attention to wander in the course of listening to a lecture, the very important principle which was signified within those formulæ. I will try and explain this principle as shortly as your valuable time will permit, referring those who wish to go further into the matter to the Patent Specification No. 22,607, 1893.

Fig. 1 is a diagram illustrating the oblique passage of a beam or pencil of rays through a meniscus-like lens, such as is used for the front combination of an ordinary rectilinear lens. It illustrates how the violently curved image yielded by this, as by all other positive lenses, may be rendered much more flat, or entirely flat, by putting a stop on the axis of the lens, and at some distance behind it. Such a lens, when used obliquely, and without any stop, gives a curious balloon-shaped image of a distant point of light, the larger and more diffused end of this image pointing *inwards*, towards the optic axis. Thus, I call this formation "*inward* coma." It is caused by the foci, or inter-crossing points of all symmetrical pairs of rays, such as *a*

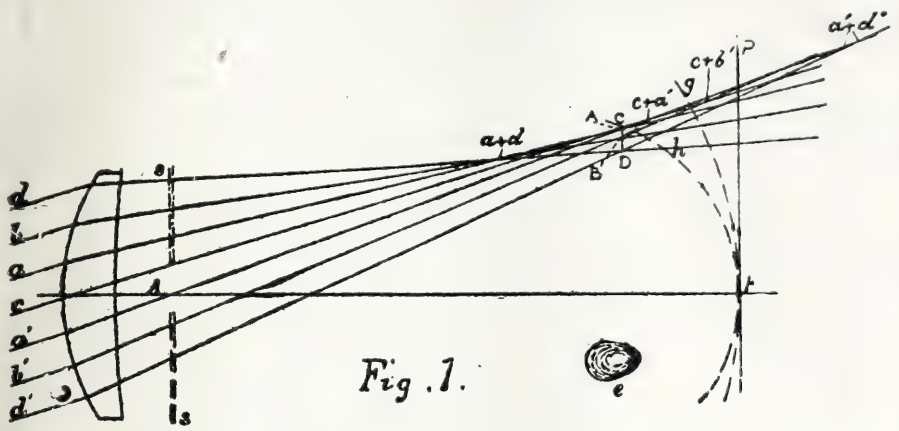


Fig. 1.

and a^1, *b* and b^1, and *d* and d^1, being successively more and more displaced below the oblique central ray, *C*—*C*. This necessarily brings it about that the foci, or inter-crossing points of any eccentric pairs of rays, such as those passing through the stop, and which are refracted through the lower portion of the lens, are displaced to positions much further away from the lens, and much nearer to, if not actually upon, the plane *F*—*P*, and thus the image is very much, if not quite, flattened.

In fig. 2 we have represented the case of a meniscus lens turned the other way about, and with the stop placed in front. This represents the case of a single landscape lens, or the back lens of any rectilinear doublet. This lens behaves in just the contrary manner to the last; it also gives a balloon-shaped image of a point of light, but with its larger and more diffuse end turned away from the optic axis. Thus, such a lens may be said to give "*outward* coma." Here the lateral displacement of foci for symmetrical pairs of rays, such as *a* and a^1, *b* and b^1, *d* and d^1, is in the outward direction, and the necessary consequence is, that the eccentric pairs of rays selected by the stop, and which pass through the upper half of the lens, are refracted to a much elongated focus, and therefore the image is necessarily much flattened. Combine these two forms of lens together with a stop in common between them, and we have the ordinary rectilinear or symmetrical doublet.

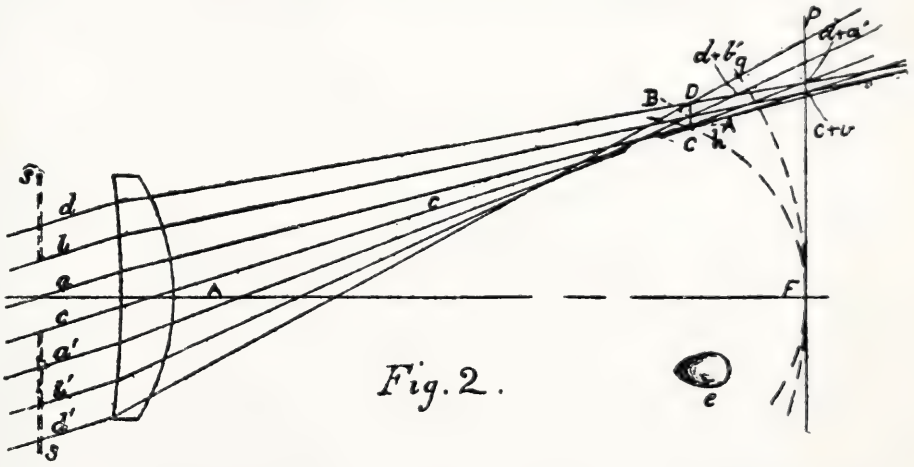


Fig. 2.

You will observe how directly opposite to one another are the optical characteristics of the two lenses now on the screen, as regards their effects, upon pencils of parallel rays passing obliquely through them. This being the case, then, it should be expected that an intermediate form of lens would be possible, possessing the optical characteristics of neither. This is the fact, and the diagram (fig. 3) illustrates the action upon oblique rays of a lens which gives neither outward nor inward coma, but whose oblique focus is quite symmetrical. All the rays of the pencil—take any pairs you like—intercross or focus at the same point, *C*. And it may be seen at once that the placing of a stop anywhere, either in front of or behind the lens, cannot possibly exert the slightest effect in modifying the curvature of the image. Thus, lenses of this type, giving what I call "symmetrical oblique refraction," may be also said to have their diaphragm corrections eliminated, which means that no diaphragm or stop can have any correcting effect upon the curvature of the image yielded by such a lens.

Given the circumstances in which any lens, either simple or compound, has to be used, then such a form can always be assigned to it by calculation as to eliminate its diaphragm corrections, and give it this property of symmetrical oblique refraction. So far as I know, lenses of this type have never been consciously employed in the construction of photographic lenses. But I will shortly show you what a great gain should be theoretically expected, and has been practically realised, by the judicious combining together of positive and negative lenses of this type.

All the photographic lenses hitherto made have owed what flatness of field they possessed more or less entirely to diaphragm corrections, the doublets *entirely* to diaphragm corrections, the orthoscopic and triplet lenses partly to diaphragm corrections.

On the other hand, I discard the old diaphragm corrections entirely, and throw the whole burden of flattening the final image and correcting the marginal astigmatism upon a negative lens whose diaphragm corrections are also eliminated. And my reasons for discarding the old diaphragm corrections may be understood by the help of fig. 4, which presents a series of radial straight line and concentric circles. Suppose any specimen of the older symmetrical or rectilinear lenses is focussed fair and square upon a large diagram like that, so that the optic axis of the lens is directed squarely towards the centre of the diagram. Now, it has been over and over again demonstrated in practice that if such a lens is so corrected as to enable you to get both a radial line, and the circle crossing it at the *side* of the diagram in focus on the screen at the same time, then your lens will have a very curved field, you will find it impossible to focus both the centre and the outskirts of the diagram at the same time; you will have to rack your screen much nearer to the lens in order to focus the marginal parts. Here we have a lens which is corrected to be free from astigmatism, but it has a very curved field. Let another lens of the same type be tried whose diaphragm corrections have been carried further so as to obtain a much flatter field; let it be supposed that you can focus *all* the concentric circles, the outer and the inner, sharply at the same time. Then you will find that, if you want to focus the outlying parts of the *radial* straight lines, you will have to rack your focussing screen very considerably nearer to the lens. The image of the concentric circles is perfectly flat, but the image of the radial straight lines is very considerably curved, and this curious phenomenon constitutes what is generally termed the marginal astigmatism of a lens. And these facts are fully borne out by theory, for mathematical investigation of the subject proves that, in the case of doublet lenses consisting of the ordinary crown and flint glasses, it is absolutely impossible to make a lens which will give a flat image of those concentric circles and of the radial lines at the same time. If the lens has no astigmatism and focusses the radial and tangential lines simultaneously, then its image, although perhaps very perfectly defined, will, nevertheless, be curved to a radius equal to about one and a half times the equivalent focal length of the lens. On the other hand, if the diaphragm corrections are carried far enough to give a perfectly flat image of the system of concentric circles, then the image of the system of radial straight lines will be curved to a radius equal to about two and a fifth times the equivalent focal length of the lens.

And the reason for this incompetence of the diaphragm corrections to bring about a flat image of both radial and tangential lines at the same time is this. Returning to fig. 3 again, the case of a lens having no diaphragm corrections, the diagram shows a curve marked *F*—*C*, this is the curve along which is formed the image of a set of distant concentric circles. This curve is very violent; it is curved approximately to a radius equal to three-elevenths, or slightly more

than a quarter of the principal focal length of the lens, and the amount of its curvature is only very slightly dependent upon the nature of the materials of which the lens is made, except in a case yet to be mentioned.

Now, the flatter curve F—g is the curve along which the image of the series of radial straight lines is formed, its radius of curvature is generally three-fifths of the equivalent focal length of the lens, and is likewise very little dependent upon the nature of the materials of which the lens is made.

It follows from these facts that the image of the concentric circles is $2\frac{1}{5}$ times as much curved as the image of the radial lines, that is,

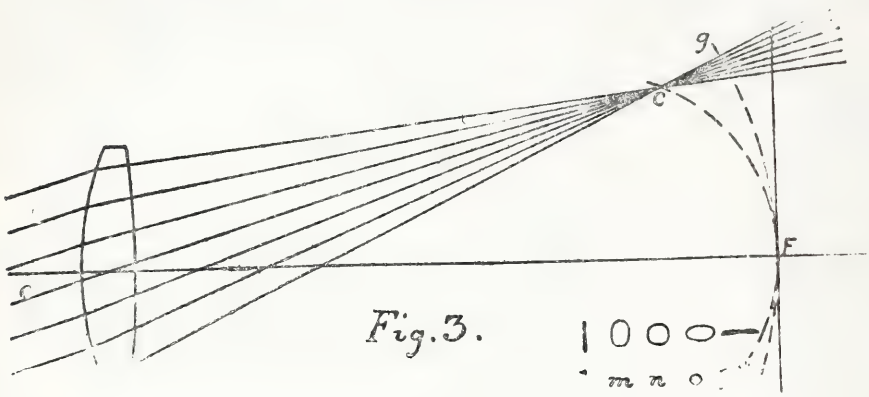


Fig. 3.

if a straight line is drawn through both circles F—C and F—g, and parallel to the optic axis, then the distance of the point C from the plane F—P is about $2\frac{1}{5}$ times the distance of the point g from the plane F—P. Contrast with this relation of $2\frac{1}{5}$ the fact that the flattening effect exerted by any diaphragm correction upon the image F—c of the concentric circles is always just *three* times the flattening effect exerted simultaneously upon the image F—g of the radial straight lines, and you will at once see we have in this incongruity between the proportion $2\frac{1}{5}$ on the one hand and 3 on the other, the explanation of the utter impossibility of obtaining by means of

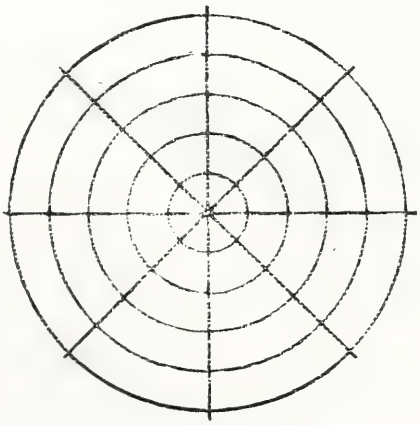


Fig. 4.

diaphragm corrections as applied to lenses made of ordinary glasses, an image which shall be simultaneously flat for the concentric circles and radial system of lines; or, in other words, the impossibility of obtaining, by means of diaphragm corrections, an image which shall be flat and free from astigmatism at the same time. There is only one condition, hinted at before, under which it is possible to make a lens, corrected by diaphragm corrections, whose image shall be simultaneously flat and free from astigmatism, and this condition, which is applied in its simplest form in the concentric lens, may be stated by a very simple formula.

If m stands for the refractive index of the positive lens of either the front or back combinations of such a lens as the concentric, and M stand for the refractive index for the same ray of the negative lens, f stands for the principal focal length of the positive lens, and F the principal focal length of the negative lens, for the same ray as above; then the combination must fulfil the conditions.

$$\frac{F}{f} = \frac{m}{M}$$

Moreover, if the combination is to be achromatic, and d represents the dispersive power of the glass of which the positive lens is made, and D represents the dispersive power of the negative lens, then we must, of course, have this equation fulfilled as well as the other, viz., that—

$$\frac{F}{f} = \frac{D}{d}$$

But the former most unusual condition, impossible of fulfilment until these new glasses were manufactured, although carried out strictly in the concentric lens, yet does not permit of the further important condition of freedom from spherical aberration to be attained, and thus large apertures are out of the question. This difficulty, however, is partly surmounted in the Zeiss & Goerz anastigmats by applying the above conditions in a much more in direct manner, unfortunately necessitating greater complication in construction.

But by abolishing diaphragm corrections altogether, and throwing the whole burden of flattening the field, and correcting marginal astigmatism upon a negative lens, I can obtain as good, if not better, results, for it should be pointed out that the curvatures of image for a negative lens for the radial and concentric systems of lines bear the same relation to one another as do the similar images formed by any positive lens made of much the same materials, and therefore the curvature errors of any positive lens having no diaphragm corrections can be corrected or neutralised by a negative lens, also free from diaphragm corrections, placed behind it on the same axis, and having the same focal power as the positive lens; at the same time such a system must necessarily have a positive focus, and form an real image.

This is the broad principle on which my new lenses are founded, and I shall now have great pleasure in leaving the more theoretical aspect of the subject, in order to throw upon the screen a few diagrammatic sections of those lenses which are already worked out, and at the same time show you a few pictures and views taken with them. I have with me the original negatives from which these lantern slides have been reduced, as well as examples of the lenses, so that those who wish may examine them afterwards.

I will first show you a section (fig. 5) of the first lens which I perfected. This, you will observe, is a triplet, and is complicated,

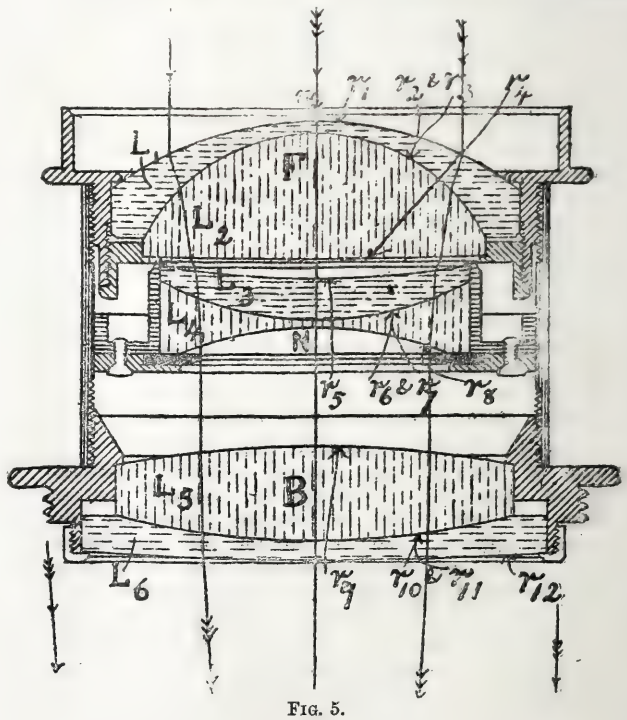


Fig. 5.

containing six lenses altogether. I should observe that these lenses must be carried out in the triplet form, otherwise they could never be made rectilinear or available for copying and enlarging, as well as for distant work, and, in order to embody the principle of correction above explained in a triplet form, it is necessary that the focal power of the negative lens should be approximately equal to the sum of the focal powers of the two outside positive lenses combined; then there is bound to be a positive focus so long as there exists any separation between the lenses. In this case each lens was self-corrected against chromatic and spherical aberration, and therefore a double combination. In

those days I thought this was essential. In the next slide you have a view of York Minster, taken with one of the lenses just illustrated, and of seven and a half inches equivalent focal length, while the view is that obtained with the full aperture of *f*-8 upon a $7\frac{1}{2} \times 5$ plate, and with the rising front of the camera raised one and a half inches.

This aperture, I should observe, was not merely *f*-8 in the centre of the view and *f*-16, or what is equivalent to *f*-16, at the extreme sides, but full *f*-8 at the extreme sides, in that the illumination was quite even right across the picture.

However, this lens was never put into the market—1st, because we came to the conclusion that it would be at least as costly as the Goerz lens to manufacture; and, 2nd, just after completing it, it occurrred to me that just as good results might be obtained by using simple outside lenses of the same type in conjunction with a simple or compound negative lens. I saw that, although this would be an immense gain and simplification, nevertheless the actual working out of such a lens would involve much greater theoretical and practical difficulties, owing to the manifold functions of the negative lens being so interlocked together, and also so dependent upon the forms of the positive lenses and the separations between the lenses. And so I found it.

Fig. 6 gives you a section of the first simple triplet which I worked out. It is a portrait lens working with an extreme aperture of

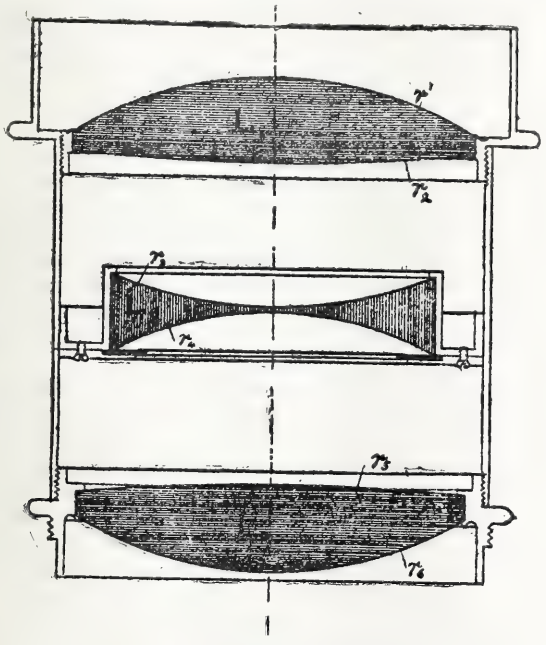


FIG. 6.

f-3·7, and covering with *f*-4, and with sufficient sharpness, a plate whose longer side is equal to half the equivalent focal length. Nobody, at first sight, would suppose it possible that the lateral image, as thrown by this lens, could be achromatic, but it is perfectly achromatic; the image is of the same size for all colours when the lens is adjusted to be free from distortion, the two conditions going togther. Obviously such a simple lens, consisting of only two similar crown glasses and one light flint, does not involve a very serious expense in manufacture.

This portrait lens, in this form, cannot be corrected completely against spherical aberration. When working at *f*-4 there is always present a zone of aberration, as in the anastigmat lenses of Zeiss and Goerz, and therefore the lens does not give critically sharp definition at full aperture; but I need scarcely point out to an audience like this that *critically** sharp definition is quite out of place in a portrait lens—it sadly impairs its practical usefulness.

* I would like to remark that, as this statement seemed to excite dissent at the meeting, by the term *critically sharp* definition I mean such perfect definition as a perfectly aplanatic lens is capable of along the axis when used at the aperture in question. Now, a really perfect lens working at *f*-4 should yield an image of a distant point of light which would be less than one-ten-thousandth of an inch in diameter. Is there any bromide film fine-grained enough to register, or any photographer fine-sighted enough, to focus detail so fine as this? As a matter of fact, the size of the silver grains on a rapid bromide plate averages one-four-thousandth of an inch, or two and a half *times as coarse* as the finest detail which a perfect lens at *f*-4 will define with conspicuous clearness (as seen through an eyepiece of sufficient magnifying power).

Fig. 7 gives a section of the next lens which I worked out, a rapid landscape lens of moderate angle but very large aperture *f*-5·6. This, as you see, consists of four simple lenses or elements, two outside simple positive lenses and a negative lens made of two lenses cemented together. In order to arrive at a lens which would be available for copying and enlarging as well as for landscape work, I found it necessary to depart from the symmetrical form, which device also receives certain other practical advantages.

The two outside lenses are made of a very hard and colourless silicate crown glass, the concave of a sort of colourless plate glass, and the meniscus cemented to it if a baryta crown, so that there are no flint glasses in its composition. Flint glass always has more or less tendency to yellow colour, and therefore it is desirable to be independent of it if we wish a lens to pass the greatest possible amount of ultra violet light, to which the bromide plate is considerably sensitive.

We now have on the screen a landscape view taken with this lens at its full aperture of *f*-5·6. In taking this view, I simply focussed

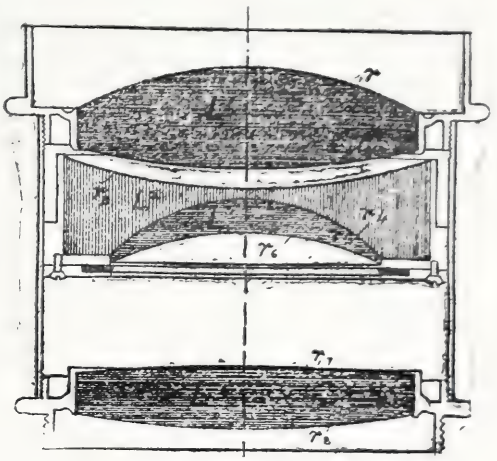


FIG. 7.

the distant houses near the bridge at the centre of the plate. The lens at full aperture does not, nor is it meant to give, critically sharp definition anywhere. The effect is a soft picture, well enough defined for the usual requirements of the landscape photographer. This slide gives you the whole of a whole-plate negative, while the focal length of the lens was ten inches, so that the angle of view was by no means a small one, and this must, of course, be borne in mind when judging the definition at the margins and corners.

The next slide shows another whole-plate view taken with the same ten-inch lens stopped down to *f*-8, and likewise focussed at the centre of the picture. The definition is perceptibly sharper than in the last. I would here like to point out that, when this lens is stopped to *f*-8, not only is that aperture effective at the centre of the plate, but the full *f*-8 is in operation right up to the margins of the view, so that the illumination of the picture is remarkably even. And here I will venture to make a few remarks upon this important matter of evenness of illumination. It is well known to most photographers that lenses, even when used well *within* the angle of view for which they are intended, are very much curtailed in their oblique aperture by light being cut off by the mounts of the lenses; in other words, the lenses are not large enough to allow for the spread of the lateral pencils of rays through the stop, and I have sometimes heard photographers express their surprise that opticians do not make their lenses larger in order to pass fuller oblique pencils of rays when large stops are in use, and thus do away with the very common defect of negatives being perhaps fully exposed in the centre, but considerably under-exposed towards the margins and corners. But the optician knows very well that if he were to make the lenses larger, if of the ordinary symmetrical or rectilinear type, then it would certainly be to the detriment of the marginal definition, for it would infallibly cause the inevitable curvature of field or astigmatism, or both, to arrest themselves with still worse effect. It is only when we have secured a better principle of correction that we are in a position to attain greater evenness of illumination, although, even then, such evenness of illumination can only be attained by sacrificing marginal definition to some extent. I have endeavoured therefore in this lens to hit the best compromise between evenness of illumination on the one hand and good marginal definition on the other.

In comparing together two totally different types of lenses of the same focal length and professing to be of the same aperture, and upon plates of the same size, the question arises, How should we estimate and compare their effective apertures and consequent effective speeds, supposing we leave the question of loss of light by absorption out of the question?

Two such lenses might both have the aperture *f*-8 along the axis, that is, both illuminate the centres of their images with a clear *f*-8. But supposing, after we have focussed the view upon the screen, we turn up the focussing screen and place one eye close to the edge of the aperture before occupied by the focussing screen, and look into the lens, we may then find that the aperture of one instrument is cut down to a narrow aperture of a lenticular form, whose area is perhaps but a half or a third of the aperture shown by the lens when viewed from the centre of the screen. In other words, we have *f*-8 at the centre, and *f*-16 (for instance), at the edge of the picture. In such a case, then, does not the fairest way of estimating its *effective* aperture resolve itself into taking a mean between *f*-8 and *f*-16, that is, *f*-11·3? Surely this should be granted at once when we remember that the sides of a picture are of equal importance to the middle from the point of view of exposure, although perhaps not of equal importance from the point of view of definition. Supposing, then, that the other lens is found to give not only *f*-8 at the centre of the picture, but also *f*-8 at the sides, then, since its effective mean aperture is *f*-8, while we have judged the effective mean aperture of the other to be *f*-11·3 only, then we have two lenses professing to be of the same rapidity, and yet one is, *in practice*, about twice as rapid as the other; for it must be remembered that the exposure found necessary with the lens of uneven aperture will really be governed by the mean illumination, that is, by the intensity of the image half-way towards the sides of the view. Some might go further than this, and, having regard to the principle that exposures should be accommodated to the darkest parts or shadows of a view, leaving the brightest parts to take care of themselves, assert that the exposure found necessary with the lens of uneven aperture would really be regulated by the illumination of the sides of the view.

Of course these considerations only have their application when we are using, rapid lenses with large apertures, for it is well known that when we stop down the small aperture *f*-20 and below, then this defect of inequality of illumination ceases, through considerable angles of view, at any rate.

I will now pass on to the next slide, showing another whole-plate view taken with the same lens also at *f*-8, and with an exposure of $\frac{1}{20}$".

The next slide shows a similar view to the last but one, but taken with stop *f*-11·3. Of course the definition is still sharper.

When we come to the subject of copying and enlarging, then the importance of large apertures and great rapidity is not quite so great, for we have not then to deal with objects in motion, as is generally the case with out-of-door subjects, and stopping down can generally be resorted to without inconvenience by operators in this class of work. However, I thought it would be interesting to show how these lenses will perform in the way of copying.

On the screen is a reproduction of a whole-plate negative which was taken with a five-inch or quarter-plate lens, which was so adjusted as to copy part of the test screen to equal size with the full aperture of *f*-5·6.

The next slide shows the same diagram copied equal size with the same lens with aperture *f*-8. You will see that this is reasonably sharp all over.

This lens is not intended for more than moderate angles; in fact, in order to gain rapidity, angle of view must be sacrificed to some extent. However, I may say that I am now engaged in working out another combination which will be closer than this one, and will have a full aperture of *f*-8, and will, I have every reason to hope, at least cover a plate whose greater side is equal to the equivalent focal length of the lens, and a much greater angle of view than this cannot be expected from lenses on this principle. It scarcely needs pointing out that innumerable varieties of lenses might be worked out on the principle which I have tried to explain to you this evening; its possibilities are not likely to be exhausted for a considerable time to come. And now, having occupied your time and attention quite as long as I feel justified in doing, I may say that I shall have great pleasure in listening to the various matters which will crop up in discussion. I may have expressed myself with anything but clearness on many points, which might be worth a little further explanation were they pointed out to me. The original negatives from which the lantern slides have been copied are on the table for your inspection, as well as examples of the portrait lens and the landscape lens.

H. Dennis Taylor.

HOW TO MAKE AN ARTISTIC PICTURE.

[Anthony's International Annual.]

All amateur photographers are not artists, yet there is no question but what the large majority of them might, by heeding the fundamental law of composition, improve the artistic quality of their pictures. There i too much reckless "snapping" here and there without any regard to the character of the result; it is only by a stroke of luck that once in a while a real picture is made, and even then the photographer is entirely unaware of it. With a knowledge of the laws of composition, however, he would find more satisfaction in obtaining one good picture than in taking a hundred careless snap-shots, while the artistic side of photography would profit thereby. The following simple rules should be kept constantly in mind.

All lines in a picture must be balanced, otherwise certain parts will appear unsustained and the picture incomplete. For instance, in a landscape with trees in the foreground at the left, mountains in the distance, and a lake at the right, the general direction of the lines of the trees may be vertical, or inclined, and the line of the mountains diagonal; but, unless there are counteracting lines to balance them, both trees and mountains will appear top-heavy and convey the impression of falling into the lake. This can be remedied by introducing in the foreground, at the right, a boat or yacht, the lines of which shall oppose those of the trees, and a few clouds in the sky contrasting in direction with the mountains. Of course it is seldom that the appropriate cloud appears at the right time, but, by keeping a collection of cloud negatives in stock, one may print in the clouds afterward. A boat may not happen to be at hand, but a rock or an old tree-stump may often be found to serve the same purpose. By taking a few steps one way or the other, desirable objects will frequently be brought into view.

In taking a picture, the position should be selected with great care. There is always more than one way to look at the same scene. To illustrate: If a rural view, with an old ox-team approaching, is taken from directly in front, the road will divide the picture in halves, with the ox-team in the centre, and very much distorted by perspective. But, if a view more to one side is taken, the effect will be improved. A square front view of anything is seldom artistic. A house looks better if a little of one side is shown as well as the front. A portrait is also improved by placing the sitter at an angle to the camera.

In a landscape the horizon line should not divide the picture exactly in halves; a third of the distance from bottom to top is better. If there is one object of interest, it should never come in the centre of the view, for the centre is always considered the weakest and least effective spot. The strongest points are at unequal distances from either side, and from top to bottom. If there are several objects of interest, one should be made more prominent than the rest by placing it in some strong point in the foreground, with the subordinate ones in less effective situations in the background, but never exactly opposite or over the chief object.

The management of light and shade is somewhat difficult for a beginner, but a little experience will enable him to judge how the best results are obtained. The light should not divide the picture in halves, either horizontally or vertically, but should fall diagonally, so as to make wedge-shaped masses of contrasting light and shade. In some cases, where a large portion of the picture is in shadow, contrast will be effected by having some object of interest placed in the highest light in the foreground. This contrast of light and dark objects sometimes takes the place of balance. If the trees, mountains, and lakes, in the scene before described, were mostly in sunlight, the dark rock or boat would be sufficient to balance them. A dark or light object in the foreground also serves to increase the effect of distance. It should not, of course, come in the centre.

The time of day for photographing any scene is an important consideration. There are no Joshuas in these times to command the sun to stand still, and therefore no scene ever presents exactly the same aspect two minutes in succession. The masses of light and shade are constantly changing, and the artist photographer will patiently wait until the scene he desires to photograph is so lighted as to give the most pleasing effect.

There are laws of unity which should also be observed. A picture must have a reason to be, and must tell its own story. The parts must be related one to another, so that they form a united whole. An elephant in a parlour is conceded to be out of harmony with his environment, but hardly more so than some of the figures ignorantly introduced by amateurs amidst unsuitable surroundings. A scene from the Yosemite Valley, representing one of the grandest views of nature, may be utterly spoiled by a human figure directly in the foreground gazing into the camera. The grandeur of the landscape appeals to the feelings of the spectator, and the eye is naturally drawn to the principal features. A human figure,

placed so prominently as to distract the attention, is out of harmony with the scene, and consequently destroys the unity of the picture. When a landscape is of itself sufficiently interesting or impressive, all figures should occupy subordinate positions; but when it is desired to bring out the figures with strong effect, a less attractive landscape should be chosen. In taking groups, the figures should not be scattered around at random, but should bear some relation to each other as do parts to the whole. The light and shade should be arranged in broad masses, graduating from the highest point of light to the darkest of shade, and never separated in spots of equal intensity. Only by careful attention to these details will the effect of unity, or that feeling of completeness so essential to an artistic picture, be produced.

In brief, therefore, the few simple rules for the amateur to observe are, Balance of Lines, Contrast of Light and Shade, and Unity, and to aid in the observance of these rules, the following suggestions are offered for guidance. First: Select a position from which no line shall divide the picture exactly in halves. Second: Place the object or objects of interest in effective points—at unequal distances from the centre and never directly in the centre. Third: Choose the time of day when the scene is most effectively lighted. Fourth: Subordinate all figures when the landscape is of paramount importance. Fifth: All parts of the picture related harmoniously.

There are other subordinate rules which might be of assistance, but the few principal ones already stated are enough for the amateur who desires to improve the standard of his work, and who is sufficiently interested in the future of photography to make some effort toward the production of artistic pictures.

MRS. CYRIL H. BURDETT.

News and Notes.

GOSPEL OAK PHOTOGRAPHIC SOCIETY.—In consequence of the holidays, the meeting arranged for January 1 has been postponed until January 8.

MESSRS. ERDMANN & SCHANZ, of 4, Salcott-road, Clapham Junction, write: "Will you kindly take note that we can supply photographs of tropical vegetation, for which we understand there is a demand amongst botanists and horticulturists."

WEST LONDON PHOTOGRAPHIC SOCIETY.—Exhibition of Record and Competition Prints.—This Society some time ago entered upon the work of making a photographic record of objects of historical and topographical interest in the neighbourhood. An Exhibition of the first year's work in connexion with this object was held at the School of Arts and Crafts, Bedford Park, on Thursday and Saturday evenings last. The importance of the work, at a time when so many old landmarks are disappearing, is well shown by photographs which were exhibited of houses which had already fallen into the hands of the "housebreaker." The exhibits numbered over 200. An award for best contribution was gained by Mr. Charles Dixon with a set of views, principally of Holland House, Kensington. Other sets specially noticed were by Mr. James Stein and Mr. W. H. Whitear. Mr. Maurice B. Adams, F.R.I.B.A., acted as Judge. An Exhibition of the prints sent in by members in competition for the medals offered by the Society was held at the same time. Medal for Class I. (The Best Picture taken at an Outing) was awarded to Mr. John Wilson for a very fine interior of the library, Holland House, which, through the kindness of Lord Ilchester, the Society had the good fortune to visit; for Class II. (The Best Portrait or Figure Study) to Mr. J. J. Adam, for a landscape with figures very happily posed; for Class III. (The best Picture of River Scenery) to Mr. Leslie Selby, *At Anchor*, a view, perfect in composition, and full of atmosphere. The Judge (Mr. W. L. Colls) was highly pleased with the Exhibition (except in Class II., Portrait or Figure Study), the work coming much nearer the old standard of the West London Society than was the case for the last year, and promising well for their annual Exhibition to be held in May.

RECENT PATENTS.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC DARK SLIDES.

No. 23,642. GEORGE FRANCIS HORNE, 21, St. John's-square, Clerkenwell, London, Middlesex.—*November* 10, 1894.

THIS invention relates to improvements in the construction of dark slides for use in photographic cameras.

In carrying out my invention I employ substantially the well-known form of dark slide, but instead of using metal, wood, or wood bound with metal, I use cardboard, millboard, or other similar material, thus reducing the weight and cost to a minimum. I also make use of a new form of shutter, having projections on each of its lower edges, which catch against similar projections on the frame of the dark slide when the shutter is drawn, thus forming a convenient stop, preventing the shutter from being drawn out completely.

The claim is:—1. A photographic dark slide constructed of leatherboard, millboard, strawboard, or similar material substantially as described. 2. The construction and use of a photographic dark slide constructed wholly or mainly of layers of leatherboard, millboard, strawboard, or other similar material, cut by dies or cutters or other means, to the required shapes, and glued or otherwise fastened together, so as to form the grooves, projections, and other parts of a light-tight case—with a connected movable shutter—for holding sensitive plates for photographic uses protected from light, and yet with capability of being exposed at will, as set forth.

IMPROVEMENTS IN AND RELATING TO PHOTOGRAPHIC OBJECTIVES.

No. 19,509.—PAUL RUDOLPH, Carl Zeiss-strasse, Jena, Germany. *November*, 17, 1894.

MY invention relates to photographic objectives, and consists in a quadruple lens, which may be used as a single objective or as a component of a double objective or doublet. This quadruple lens is distinguished by uniting with a very high distinctness, even of the marginal portions of the image and a great useful angle of field, an exceedingly high rate of the relative intensity of light.

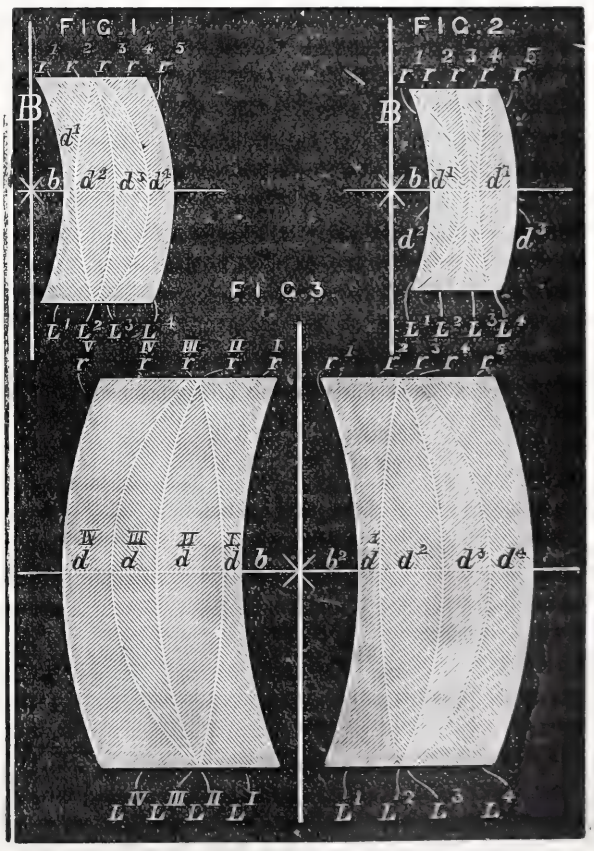
Such result I obtain by cementing together two double lenses or couples of lenses, each of which comprises a collecting lens and a dispersing lens, and in one of which couples the refractive power of the collecting or positive component surmounts the refractive power of the dispersing or negative component, whilst in the other double lens the refractive power of the negative lens surmounts that of the positive lens. In following this principle of construction, I may freely select the dimensions of the single lenses, limited only by the kinds of glass which are at my disposal, and by the special requirement to be met by the objective, without substantially altering by any of such combinations of lenses the above stated optical effects which are united in my quadruple lens.

In consequence of the great variability of shape of the quadruple lens constructed on my principle, the two component double lenses may both represent positive systems, *i.e.*, systems which are equivalent to collecting lenses, or only one of them may be positive, the other being a negative system (equivalent to a dispersing lens) even of an infinitely long focal distance. If the quadruple lens is employed as a component of a double objective, both couples of lenses, of which the quadruple lens is composed, may form negative systems. Moreover, the achromatisation of the quadruple lens may be effected by achromatising either of both double lenses, or by providing them with contrary chromatic aberrations which compensate one another. Furthermore, both couples of lenses may be associated in any order of combination, both collecting lenses or both dispersing lenses, or the dispersing lens of the one couple and the collecting lens of the other couple being cemented together as may be required. Finally, the above-explained principle of construction does not prevent the graduation at will of the refractive power of the single lenses following one another.

As to the double objective, one or both components of which are quadruple lenses of the described kind, both separate lens systems may be of the same or of different focal lengths, and the focal length of both or only of one may be positive. Moreover, either lens system may be for itself completely corrected so as to be occasionally employed as a single objective, or both lens systems may be constructed with aberrations of about the same amount, but in contrary sense, so that the aberrations of either component compensate one another. If only one component of the double objective consists of the above-described quadruple lens, the other component may be of any construction—it may consist of only one single lens, or of any number of parts cemented together.

In the annexed drawings three different arrangements of objectives carried out according to my invention are shown in section.

Figure 1 represents a quadruple lens, in which the two couples of lenses are



cemented so as to associate the positive components of both couples. The first couple of lenses consists of a biconcave lens, L^1, and a biconvex lens, L^2;

the second couple of a concavo-convex collecting lens, L^3, and of a convexo-concave dispersing lens, L^4.

Figure 2 represents a quadruple lens, in which the two couples of lenses are cemented so as to associate the negative components of both couples. The first couple of lenses consists of a concavo-convex collecting lens, L^1, and of a convexo-concave dispersing lens, L^2; the second couple of a biconcave lens, L^3, and of a biconvex lens, L^4.

Figure 3 represents a symmetrical double objective constructed of two equal quadruple lenses of the kind represented in figure 1, the component parts of one lens being indicated by 1, 2, 3, 4, as in figure 1, and the corresponding parts of the other lens by I., II., III., IV. Both lenses are separately corrected so as to be capable of being used as single objectives.

In these three figures the line lettered with B represents the plane of the diaphragm, the letters r^1, r^2, r^3, r^4, r^5 indicate the radii of curvature of the lens surfaces, and the letters d^1, d^2, d^3, d^4 denote the thickness of the single lenses in the optical axis. The letter b in figures 1 and 2, and the letters C^1 and C^2 in figure 3 denote the distance of the plane B of the diaphragm from the vertex of the next lens surface.

In conclusion, I append to this specification of my invention three examples of construction, which correspond to the three figures of the drawing. All dimensions, radii, thicknesses of lenses, and distances of the diaphragm are expressed by proportional numbers, the focal length of the whole objective being taken as unity. A simple multiplication of these numbers with the focal length required in any particular case will suffice for obtaining the dimensions of the objective that is desired.

The different kinds of glasses are determined by the indices n_D and n_{G_1} relating respectively to the D line of the solar spectrum, and to the Hγ line of the spectrum of hydrogen.

First Example.

Quadruple Objective Lens represented in Figure 1.

Effective Aperture, 0,091.

Angle of Field more than 85°.

Radii.	Thicknesses of Glass.	Distance of the Diaphragm from the next Lens-surface:
$r^1 = -0{,}132$	$d^1 = 0{,}0053$	
$r^2 = +0{,}237$	$d^2 = 0{,}0169$	
$r^3 = -0{,}116$	$d^3 = 0{,}0148$	$C = 0{,}0158$
$r^4 = -0{,}071$	$d^4 = 0{,}0106$	
$r^5 = -0{,}138$		

Kinds of Glass:

	n_D.	n_{G_1}.
$L^1 = L^3$	1,51000	1,52005
L^2 =	1,60852	1,62225
L^4 =	1,58250	1,60052

Second Example.

Quadruple Objective Lens represented in Figure 2.

Effective Aperture 0,074.

Angle of Field more than 85°.

Radii.	Thicknesses of Glass.	Distance of Diaphragm from the next Lens-surface.
$r^1 = -0{,}143$	$d^1 = 0{,}015$	
$r^2 = -0{,}056$	$d^2 = 0{,}004$	
$r^3 = -0{,}290$	$d^3 = 0{,}004$	$C = 0{,}017$
$r^4 = +0{,}497$	$d^4 = 0{,}017$	
$r^5 = -0{,}132$		

Kinds of Glass.

	n_D.	n_{G_1}.
L^1	1,51790	1,52882
L^2	1,56063	1,57474
L^3	1,51790	1,52916
L^4	1,60954	1,62318

Third Example.

Two equal quadruple lenses of the shape represented in Figure 1 arranged symmetrically to form a double objective, this arrangement being represented in Figure 3.

Effective Aperture 0,18.

Angle of Field about 85°.

Radii.	Thicknesses of Glass.	Distance of the Diaphragm from the next Lens-surface.
$r^1 = -r\text{I} = -0{,}229$	$d^1 = d\text{I} = 0{,}0091$	
$r^2 = -r\text{II} = +0{,}411$	$d^2 = d\text{II} = 0{,}0293$	$C^1 = C^2 = 0{,}0274$
$r^3 = -r\text{III} = -0{,}201$	$d^3 = d\text{III} = 0{,}0256$	
$r^4 = -r\text{IV} = -0{,}123$	$d^4 = d\text{IV} = 0{,}0183$	
$r^5 = -r\text{V} = -0{,}239$		

Kinds of Glass.

	n_D.	n_{G_1}.
$L^1 = L^3$	1,51000	1,52005
L^2	1,60852	1,62225
L^4	1,58250	1,60052

I claim as my invention :—1. A quadruple lens for single and double photographic objectives cemented together of two couples of lenses, each of which couples consists of a collecting and a dispersing lens, the dispersing lens of one couple having a higher refractive power, and the dispersing lens of the other couple having a lower refractive power, than the collecting lens coupled therewith, substantially as described with reference to the drawing, 2. A photographic double objective or doublet, of which one or both lens system consist in a quadruple lens cemented together of two couples of lenses, each of which couples consists of a collecting and a dispersing lens, the dispersing lens of the one couple having a higher refractive power, and the dispersing lens of the other couple having a lower refractive power, than the collective lens coupled therewith, substantially as described with reference to the drawing.

Improvements in Photographic Print and Plate-washers.

No. 1612. John Murrell Timmis, 3, Brook-street, Birmingham, and Walter Harry Smith, 111, Guildford-street, Aston, near Birmingham. *November* 24, 1894.

This invention relates to improvemenis in washing apparatus for photographic prints or plates, and has reference more particularly to the circular type of such washers.

It consists as follows :—A circular vessel is provided of suitable diameter and depth, and more or less of a (vertical) cylindrical shape, but preferably increasing somewhat in diameter from the bottom upwards. We now provide what is usually termed a false bottom, that is, at a given height from the real bottom of the vessel is placed a secondary bottom, which may be removable or fixed. The bottom is further perforated throughout its surface with small holes. Into the false chamber (that is, between the two bottoms) we introduce the inlet or water-supply pipe, which is carried partly around the circumference of the said interior, having its exit at or near its end.

Again. At the top of the vessel we further provide a perforated upstanding rim of any suitable or desirable depth, which serves as a means of discharge. Upon the exterior of this rim, and below it, we may in some cases provide an all-round gutter or channel into which the overflow may pass, and by which it may be conveyed to any given point, and thence carried off by pipe or otherwise.

We may also, if desirable, attach to or carry upon the exterior of the vessel, a syphon pipe having connexion with the interior of the false chamber, so that from time to time, when desired, any sediment, &c., may be drained therefrom.

The action of this our invention may now therefore be described thus :—The water entering the chamber by means of the circular pipe excites a circular current which passes thence into the vessel proper through the perforated bottom. Its passing through this perforated bottom, however, destroys or breaks up all violent action, so that the current is gentle and harmless to the prints or plates which may be placed in the vessel. As the water reaches the top, it is carried off by the all-round perforated rim, the essential feature of which is, that, inasmuch as the said rim is thoroughly perforated all round with small holes, the discharge is uniform all round, and consequently the tendency to draw the prints to the side is obviated, and particularly so that they are not drawn to any particular place.

It will, of course, be readily seen that a plate rack may be suspended within the vessel, so that negatives may be similarly washed when required.

Improvements in Photographic Cameras and Apparatus connected therewith.

No. 23,988. William Ritchie Baker, 9, Belmont-villas, Wallington, Surrey. *November* 24, 1894.

My improvements are chiefly designed to make a simpler and more convenient form of the camera described in the specification of my patent, dated November 20, 1888 (No. 16,894), but they may be adapted for use with all other kinds.

Instead of keeping the plates in the dark slides there described, I may place them in those of ordinary shape, or changing backs, so modified that the plates will come forward into the place previously occupied by door, when it is withdrawn, and be pushed back again when it is closed. The front of the door, being white, will act as the focussing screen, and thus do away with the somewhat elaborate arrangement that was necessary in the old camera to bring the plates into register. Cut films would be perfectly kept in a changing back made on purpose for them, the size of which would be that of the camera to the back of which it would be applied, and might be retained in its place by a flange and suitable fastenings. A magazine to contain the films would be fixed in this changing back, so as to leave a larger space between the top than the bottom of the case, and sufficient room on either side for an endless chain to circulate without touching the films. These chains would be kept in position by properly shaped wheels in the spaces above and below the magazine, and be driven by suitable wheels in the upper one, connected together, and with a handle on the outside. A cross piece, which may be formed of thin steel with a projection of about one-sixteenth of an inch along the lower edge to engage the film and carrier, is fixed to opposite links of the chain, and, as it rises, it pushes the first film and carrier upwards, and over the top of the magazine to the back, where it is retained by suitable springs, or other means. If an opaque blind is attached to the cross piece, it will render a shutter unnecessary, and may be made to act as a focussing screen, as explained above. Instead of the chains going round and round, they might go to the right to cover the plate, and to the left to change it, in which case the projection would be at the bottom of the blind, so that the film would be covered and protected by it as it was taken to the back of the magazine.

The carriers may be formed of some pliable material, such as cloth, felt, &c., which might be stiffened with thin steel, or cemented to a piece of celluloid the size of the film to go next to it, and, if the cloth was a little narrower than the celluloid, so as to leave a quarter of an inch each side, and projections to correspond were fixed upon the front of the magazine, it would be impossible for the front carrier to take the film behind with it as well as its own.

This might also be prevented by the carriers being furnished with a catch to hold the films, or in other ways. The focussing arrangements would be the same in the new as in the old camera, except that the side of the eyepiece would be made to close the opening in the top and the mirror would be covered by flaps, which would be so connected with the eyepiece that, when it was raised, the mirror would be uncovered, and covered when it was lowered.

In order to make the camera as small as possible, I may fix the bellows to

the sides instead of to the usual frame, and keep the first three or four inches, which might be of one fold only, fully extended by an elbow or stay. If a long focus is required, I hinge the back of the camera in the usual way to two pieces of metal that slide in a groove in each side of the baseboard, but lengthen them considerably in front, so that the body of the camera can be drawn out beyond the back of the baseboard. To fit it for a hand camera, I provide a cover of thin material, and keep this in shape, if necessary, by a collapsible frame or stay fixed to the camera. The exterior might be covered with leather to form a case, a roller-blind shutter attached to the changing back, if desired, and the details altered, or equivalent ones substituted to suit the camera that was being made.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
31	Camera Club	
31	North Middlesex	Technical, and Nomination of Officers.
31	Richmond	*Development*. Mr. Ennis.
January.		
1	Birmingham Photo. Society	
1	Bolton Photo. Society	
1	Brixton and Clapham	Informal Meeting and Lantern Night.
1	Exeter	
1	Hackney	Smoking Concert.
1	Herefordshire	
1	Keighley and District	
1	Lewes	
1	North London	
1	Oxford Photo. Society	
1	Paisley	
1	Rochester	
1	Rotherham	
1	Sheffield Photo. Society	
1	York	
2	Bournemouth	Demonstration on *Lantern-slide Making*. William Tylar.
2	Croydon Camera Club	Lantern Night: Members' Slides.
2	Edinburgh Photo. Society	
2	Leytonstone	
2	Photographic Club	*Half-tone Copper Blocks by the Enamelline Process*. Henri Calmels.
2	Southport	
2	Southsea	
3	Birmingham Photo. Society	
3	Bournemouth	*Rambles and Scrambles in the Rocky Mountains*. William Tylar.
3	Camera Club	
3	Dundee and East of Scotland	
3	Ealing	Lantern Evening.
3	Glasgow Photo. Association	
3	Glossop Dale	
3	Hull	
3	Leeds Photo. Society	
3	Leigh	*Mezzotype*. J. Berry.
3	Liverpool Amateur	Lantern in use for Members.
3	London and Provincial	*Collodio-chloride Emulsion for Transparencies*. J. S. Teape.
3	Oldham	
3	Tunbridge Wells	
3	Woodford	*Photo-micrography*. H. Cronch.
4	Brighton and Sussex	
4	Cardiff	
4	Croydon Microscopical	
4	Holborn	
4	Leamington	
4	Maidstone	
4	North Kent	
5	Hull	

PHOTOGRAPHIC CLUB.

DECEMBER 19,—Mr. A. Cowan in the chair.

The CHAIRMAN said it was his privilege, his duty, and certainly his pleasure, to introduce to those members who did not know him the founder of the Photographic Club, Mr. Brittlebank.

Mr. Brittlebank was accorded a most hearty reception.

Mr. W. D. WELFORD gave a lantern lecture upon *The Humour and Pathos of the Streets*, illustrated by about 100 slides, for which he received a hearty vote of thanks.

Mr. BRITTLEBANK showed some interesting photographs illustrating life in South Africa. He also gave a very lucid description of *Diamond-mining*.

MANCHESTER PHOTOGRAPHIC SOCIETY.

DECEMBER 13.

The usual monthly meeting partook of a social character, when photographic views, transparencies, negatives, &c., the work of the members, were on view. Messrs. Blakeley, Whittaker, and Wolfenden exhibited collections of interesting stereoscopic views. Mr. W. G. Cook had a large collection of excellent photographs printed by various methods. Some 15×12 photographs of statuary were shown by Mr. Cobley, displaying careful work. Several interior views of large size were sent by Mr. Tomlinson. Albums of photographs were contributed by Messrs. Brier, Casson, Edwards, and W. B. Wood. A revolving stereoscope, fitted with choice slides, the work of Mr. J. Wood, was much appreciated, as was also a photograph magnifier belonging to the President (Mr. H. M. Whitefield). Several negatives showing different styles of work were also exhibited by the President.

During the evening the company were entertained by an exhibition of choice lantern slides, the productions of Messrs. Brier, Coote, Casson, and Whitfield.

Mr. Taylor was elected a member.

Brixton and Clapham Camera Club.—December 18.—A paper was read by Mr. E. DOCKREE on *Architectural Photography*, from the practical standpoint, full of suggestions, not only as to what should be done and how it might be done most successfully, but as to the many subjects which it were wiser not to attempt. He recommended his hearers to study the characteristic features of any building, and to give especial attention to them rather than to a series of somewhat similar general views. The apparatus and plates more especially suited for this class of work, and the method of development he had found trustworthy, were treated of, and many were the hints given which were worth making note of. A number of slides particularly illustrative of his remarks were afterwards shown by the lecturer, who invited and obtained criticism of them by his fellow-members.

Ealing Photographic Society.—December 20, at the Society's room, Public Buildings, Ealing, Mr. H. W. Peal in the chair.—The minutes of the previous meeting were read and confirmed. Two new members were proposed. Dr. CLIFFORD GIBBONS then gave a paper on *Collodio-bromide for Lantern Plates and Transparencies*. He first pointed out that it was cheaper to buy the emulsion than to make it, a bottle of Brooks' emulsion containing sufficient to coat eleven or twelve dozen lantern plates being procurable for seven shillings. The glass must first be well cleaned. An easy method of doing this is to take old plates and place them, for at least an hour, in the following solution: Bichromate of potassium, 1 ounce; commercial sulphuric acid, 2 ounces; water, 10 ounces. Afterwards rinse under tap, and then polish with wash leather, take on to plate-holder, and rub over with French chalk; rub this off with piece of wash leather stretched over small block of wood. It is very important that the glasses be absolutely clean. They are then edged with a solution of indiarubber. This is best done by using a camel's-hair brush, mounted in tin, with a pin slipped down the side; this pin forms a stop on side of plate, and ensures the edges being evenly coated; the coating is necessary to prevent the film slipping off during subsequent operations. After drying, the emulsion is poured on, and the plate coated as with wet collodion, and then dried, either spontaneously or by aid of gentle heat. When dry, the plates are ready for exposure, either in the camera or by contact. They are easy to use if the instructions are followed, and, even if slightly fogged, are easily cleared; if too thin, they can be redeveloped or intensified, and they can be toned with either gold or platinum. Warm or cold tones can be obtained according to the exposure. The meeting adjourned to the dark room, where Dr. Gibbons successfully carried out all the operations, from cleaning the glass to the finished slide. Numerous questions were asked and answered satisfactorily, and the meeting closed with a vote of thanks to the lecturer.

Gospel Oak Photographic Society.—December 18.—Mr. W. BEYER gave an interesting paper on *The History of Photography*, and, at the close, alluded to, and explained, the carbon process. It was resolved that the next meeting be January 8 instead of January 1.

South London Photographic Society.—December 17, the President (Mr. F. W. Edwards) in the chair.—Mr. C. F. Dickinson gave a lecture, illustrated by slides, entitled, *Bridges, Ancient and Modern*. He first showed examples of natural bridges and arches, including London Bridge, Torquay, after which he dealt with bridges of wood in various parts of the world, many of which were very picturesque. Bridges of stone of different types followed, including the peculiar triangular bridge at Crowland, Lincolnshire. After describing many bridges of iron, the lecturer illustrated the Roman aqueducts in Spain, and concluded his lecture with slides of the Balcombe Viaduct, the Tay Bridge, the Forth Bridge, and the Tower Bridge.

Richmond Camera Club.—December 17, Mr. Ardaseer in the chair.—Mr. King showed a Chadwick hand camera, which appeared to be a good thing; but he had found all the slides leak when the pull-out shutter was withdrawn, there being no cut-off to keep out the light. Mr. TAYLOR gave a practical demonstration of his method of making plate-sunk mounts by means of cardboard "plates" or dies. A piece of Bristol board is taken of the exact size of the mount, and a piece cut out from the centre one-sixteenth of an inch larger each way than the plate mark it is desired to make. The piece thus removed is then cut down one-sixteenth of an inch, and forms the die, while the remainder of the board forms the matrix or mould. The die is attached to the mould by a strip of linen passing from the back of the latter in such a way that, when the mount is placed in between them, the die is exactly over the centre of the aperture of the mould. Thus placed in position, mould, mount, and die are inserted in a copying press, and, with a turn of the screw, a neat and effective plate-sunk mount is produced. Dies and moulds can, of course, be cut to any shape or size, and can be used over and over again, so that the mounts can be thus turned out expeditiously and cheaply.

Midland Camera Club.—December 19, General Meeting.—The PRESIDENT (Mr. H. R. Leech), in introducing the lecturer, Mr. W. Tylar, said that his experience as an old cyclist and photographer was that, if you wished to be thoroughly suited with either cycle or camera, you should go to the manufacturer who practically uses his own goods; you could then depend upon having your wants and requirements complied with. He believed that the secret of Mr. Tylar's success was that his practical experience enabled him so readily to meet a want or a demand. Mr. TYLAR'S lecture, *An American Tour*, was enthusiastically received and thoroughly enjoyed by all present. Dr. Hall Edwards exhibited an invention of his own as lantern-slide clamp and mounting-board combined. It is patented, and will soon be on the market.

FORTHCOMING EXHIBITION.

1895.
March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

HUME'S LANTERN-SLIDE SALE.

To the EDITOR.

SIR,—I have only now noticed Messrs. York & Son's letter in your issue of the 14th inst. referring to my advertisement in your LANTERN SUPPLEMENT of the 7th inst., offering their own and other well-known firms' slides at prices which are so obviously neither the retail nor the wholesale rates, that I imagined every reader would understand in the clearest manner that I was weeding out or reducing my stock of lantern slides, without writing to the makers to ask ridiculous questions. Happily, many have seen this for themselves, and sent me their orders, and expressed their satisfaction.

I am in no need, as yet, of having my advertisements edited for me, and there was surely no necessity whatever for Messrs. York & Son to suggest that mine was ambiguously worded, or intended to throw dust in the eyes of the intelligent class of readers who take your excellent JOURNAL.

Hoping you will be good enough to insert this little alembic, I am, yours, &c.,
WILLIAM HUME.

Lothian-street, Edinburgh, December 20, 1894.

A CHRISTMAS SUGGESTION.

To the EDITOR.

SIR,—The present season, in which, no doubt, most of us will participate with great enjoyment, may be a sorrowful one to many in our hospitals. I am fully aware that the hospital staffs do their utmost to cheer the inmates, but cannot we also assist them in their labour of love? Many of us have prints which are put aside because we do not consider them good enough specimens of our ability. Why not mount these in a small album (a large one would become wearisome to most patients)? If landscape subjects, write under them the names of the localities; if architectural, a few lines on their history and age; if of figures, street life, or anything amusing, give them an appropriate title. Send this album, when completed, to a hospital in the neighbourhood. In this way we may gladden the heart of many sufferers with little expense to ourselves. Thanking you for giving me space for these few lines, I am, yours &c.,
DIGBY H. W. COTES-PREEDY.

King's Norton, Worcestershire, December 20, 1894.

KEEPING THE DEVELOPER WARM.

To the EDITOR.

SIR,—Probably few have a dark room warmed up to 50° or 60°, night and day, and, if solutions are allowed to cool during the night, it will take most of the day for them to warm up unless heat is artificially applied.

The following method is most useful for keeping the various solutions warm while working. Obtain one or more two-pound tin biscuit boxes; if they are not water-tight at the joints, have them made so with solder. When going to work, fill them with very hot water, put the lids on, and then stand them in or near the developing sink. Keep the dishes more or less standing on the boxes, according to the temperature. A rough wood case round the box will keep the water warm much longer, and is an advantage if many plates have to be dealt with.

One of the many advantages of films is that they do not chill the developers, &c., as do glass plates,—I am, yours, &c.,
H. G. M. CONYBEARE.

Ingatestone, December 19, 1894.

Answers to Correspondents.

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

T. FOX.—We have heard nothing of the concern during the past year or two. We do not even know if the business is still in existence.

NOTTS.—It is quite a matter of taste as to which are "best," matt surface or glossy prints. Some prefer the one and some the other. You will do well to supply both according to the preference of the sitters.

F. R. W.—We do not recommend the addition of antiseptics to starch paste. If the paste be used freshly made, none are required. It is but small trouble to make a little fresh starch when the pictures are to be mounted.

DURHAM.—An excellent formula for a mixture for coating machinery with, prior to photographing it, will be found in the ALMANAC just issued. The coating can be readily removed when the photograph has been secured.

H. BURGESS.—"Gum Benjamin" is benzoin. It is used in some spirit varnishes, mixed with other resins. By itself it does not make a good varnish for negatives. You cannot do better than adopt one or other of the varnishes formulæ for which are given in the ALMANAC.

R. C. (Lincoln).—A nine-inch condenser will not be large enough to illuminate a whole-plate negative for enlarging. One of not less than ten and a half is necessary. Eleven inches would be better. The diameter of the condenser must not be less than the diagonal of the negative to be enlarged, or rather that of the subject to be included.

PROF.—We see no advantage to be gained by your joining the Society referred to, judging by the reports of the meetings that have been published. If you wish to join a professional body, we should advise you to consider the Photographers' Copyright Union. From the circular issued and the names of those who are the promoters, it promises to be a most valuable Association to professional photographers.

C. E. WADE.—You will find formulæ for the albumen process in the ALMANAC, and details for working in the back volumes, also in the ALMANAC. Albumen transparencies are considered by some to be superior to all others, and so they undoubtedly were at one time. But now they are run very closely, even if they are not equalled, by gelatine. Gelatine plates can be bought ready for use, albumen plates are troublesome to prepare, and require considerable experience to use them.

S. R. E. asks what are eburneum pictures, or if there are any pictures known under that or a similar name?—Yes; they are collodion transfer transparencies taken on glass; but, instead of being transferred on paper, they are transferred on to an artificial ivory. The method is this: A collodion picture is made, in the camera, from a negative, and, after being fixed and washed, it is placed on a levelling stand, and a solution of gelatine, containing sulphate of baryta or other white pigment, is poured on in sufficient quantity to form a film as thick as a stout visiting card when dry. When this coating is dry, the whole is stripped off, and a very pleasing picture is obtained, somewhat resembling ivory in appearance. The pictures are seldom, if ever, made nowadays.

J. WHITFIELD writes as follows: "In building a residence for myself, I have contrived to convert what would have been an attic, on the north side, into a small studio, for private use. My architect wishes to make the top light, which is not very large, of muffled glass, as sample enclosed, instead of ground glass, as I suggested. Please give me your opinion. Will it be an advantage over plain glass, or otherwise? Will it scatter and diffuse the light, or will it make it spotty and irregular? The side light is, of course, ordinary clear glass."—The glass proposed to be used will be of no advantage whatever over plain or ground glass. Practically, it will make little or no difference which is employed. On the whole, we should prefer ground glass, though the "muffled" would perhaps be the more ornamental.

T. BLAKE says: "I am frequently annoyed by moisture condensing on the slides while they are in the lantern. Particularly was this the case with me the other night. I had hired a hundred first-rate slides, and invited some of my neighbours and their children to a little entertainment, and in almost every case, before the slide could be focussed on the screen, it was covered with moisture, and a minute or more had to elapse before the picture could be seen to advantage. Is there any remedy for this?"—Yes, and a very simple one. It is well known that, when cold glasses are brought into a warm room, and there is moisture in the air, as there always is in crowded rooms that are not well ventilated, dew condenses on the surface. So with the slides, if they are cold when they are put into the lantern. The remedy is to keep the slides in a warm place for some hours before they are required, so that they can become thoroughly warmed; then there will be no condensation.

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MONTHLY SUPPLEMENT

[To the "British Journal of Photography."] [*January* 5, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

The principal topic of the past month in lantern circles has undoubtedly been the cylinder catastrophe at Bradford. To guard against the possibility of similar accidents occurring again, numerous suggestions have been published having reference to Government inspections of cylinders, reannealing, cases for cylinders, and so forth. Much discussion between experts is in progress, and it is to be hoped that the result will be such as to reassure the users of compressed gases in cylinders. Some of the railway companies seem to have taken fright since the affair at Bradford, and decline to carry the charged bottles by passenger trains. Lanternists are talking about the reintroduction of bags, and oil lamps are stated to have acquired a sudden rise in favour. On the whole, a great deal of alarm, some of it of a foolish nature, has been created.

* * * * *

Professor Goodman, of the Yorkshire College, Leeds, has published a report in which he details some tests made with the ill-fated Bradford cylinder, and others of a similar kind, for comparative purposes. The results of his tests and experiments led to the conclusions:—1. That the material of the Bradford cylinders is of a hard, brittle, and unyielding character, quite unsuitable for carrying high internal pressures, especially in its original state before it has been annealed. 2. That the process of annealing greatly improves the material by making it softer, more ductile, and tougher, and thereby rendering it less liable to sudden fracture on receiving a blow. 3. That the material in such oxygen cylinders as those in use at the Yorkshire College is tough and ductile, and is of such a character as will allow of the cylinders being considerably bruised, dented, and distorted without any fear of their suddenly bursting.

* * * * *

The report concludes with the following recommendations:—"1. That oxygen cylinders should only be made of mild steel of the best quality, having a tensile strength of not over thirty-two tons per square inch, with an extension of not less than twenty per cent. on ten inches, and that the carbon should not exceed 0·2 per cent., and the iron should not be less than ninety-nine per cent. (Best Yorkshire iron might probably be even more satisfactory for making cylinders than mild steel.) 2. That all cylinders should be thoroughly annealed at a cherry-red heat, both when new and afterwards at stated intervals. 3. That greater care should be taken in the manufacture to ensure a more even thickness of metal in the body of the cylinder. 4. That the stress in the material should not exceed six tons per square inch, *i.e.*, the thickness of the metal in the thinnest place should not be less than one-fifteenth of the inner diameter of the cylinder. 5. That the high-test pressures now adopted should be reduced. The demand for such high-test pressures encourages the use of steel of very high tensile strength, with its corresponding hardness and brittleness and general unreliability." Professor Goodman's final observation that, as far as he is aware, "there never has been a case of an accident through the bursting of a cylinder in a lecture-room or in transit, and that the public need not be in the slightest degree nervous about sitting near them while lantern lectures are being delivered," deserves to be reproduced in the form of a big poster, and placed in a conspicuous position in all lantern lecture-halls in order to reassure the timid and the nervous.

* * * * *

Mr. Birt Acres, in the *Photographer's Record*, advocates charging the cylinders with the gases at a lower pressure than at present. He says: "The lesson to be learned seems to us that too much has been sacrificed to portability; the old-fashioned gas bags are certainly inconvenient for travelling, and it is a great advantage to be able to carry a considerable number of cubic feet compressed into a small tube; but why so much compression? At present it is the rule to charge cylinders under a pressure of 120 atmospheres, which means the normal pressure of the air at sea level, which equals fifteen pounds to the square inch multiplied by 120, which gives the enormous pressure of 1800 pounds per square inch, which is about twelve or fifteen times greater than the pressure of steam on an ordinary locomotive boiler. We would suggest that either the present cylinders be only charged with half to two-thirds their indicated capacity, thus reducing the pressure proportionately, or that the plan be adopted which is, we believe, largely in use in America, viz., using larger holders, say, contents one cubic foot to hold twelve cubic feet of gas. The metal of which the holder is made would be, of course, much thinner in proportion, and so the actual weight would not be much greater, and the difference between 180 pounds to the square inch and 1800 pounds in the event of a fracture would be an enormous advantage. Furthermore, under the lower pressure, there would not be the same difficulty about testing, and the metal not being put to such a severe strain would not cause it to alter its character, as is likely to be the case under the present system."

* * * * *

The views of Mr. K. S. Murray, the Manager of Brin's Oxygen Company, through whose hands an enormous number of gas cylinders pass from day to day, on the Bradford accident and its consequences will be of peculiar interest just now. They will be found in an addendum to Chapter III. of the author's recently published and extremely useful *Handbook to the Use of Compressed Oxygen*. After touching upon Professor Goodman's conclusion that the accident was due to the fact that the cylinder had escaped annealing, Mr. Murray goes on to state that the Compression Companies will in future reanneal all cylinders themselves.

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"It is," says Mr. Murray, "paying a very poor compliment to the intelligence of makers and others, who have been responsible for the development of this trade in cylinders, to infer from this one accident—as I am sorry to see certain correspondents in the newspapers are doing—that the business is being conducted recklessly and without due regard for public safety. To answer such charges, one need only point to the fact that, in spite of the thousands of cylinders which have been circulating through the country for many

years, this is the first case of the kind which has occurred. The importance of annealing has never been ignored by the Compressing Companies, but they have hitherto considered it a matter which might safely be left in the hands of the makers. The Bradford accident, however, shows that, with the existing precautions, it is possible for an unannealed, and consequently brittle, cylinder to be charged with gas; and the only sure way to prevent the recurrence of such a case is for the Compressing Companies to make it a rule to reanneal all cylinders themselves. This is what the Brin's Oxygen Company—and, I believe, the other Companies affiliated with it—have decided to do. They are adopting this course entirely in their own interests and that of the public, and with no desire to underrate the care with which cylinder-manufacturers conduct their business. Their object is simply to trap unannealed cylinders—like the one in question—which may have escaped the vigilance of the makers, and thus assure annealing before they are filled with gas. All cylinders now in use will be gradually treated in this way, with as little inconvenience and expense to the owner as possible; and reannealing will henceforth be made a *sine-quâ-non* with all new cylinders."

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Professor Goodman's conclusion that the accident was due to the cylinder not having been annealed, followed by Mr. Murray's statement that in future all cylinders are to be reannealed, should dispel a great deal of the alarm to which we refer above. There should be no necessity for Governmental interference.

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Messrs. Peak, Frean, & Co., of Drummond-road, S.E., have sent us two lantern slides of amusing subjects, upon which are grafted the inevitable advertisement of the firm's biscuits. The slides are nicely coloured.

NOTES ON THE OXY-ETHER LIGHT.

Substitutes for carburetted hydrogen have been desired by lanternists ever since the limelight was invented, and in various forms have been adopted with varying success.

The most popular of recent years is the vapour of sulphuric ether conveyed to the lantern jet by a flow of oxygen gas passing over it and becoming saturated with it; but hydro-carbon gas and natural gas are employed for domestic and other lighting purposes in many places in England and America, and might be available for this purpose.

Speaking the other day to one of the pioneers of improved methods of obtaining the limelight without coal gas or pure hydrogen, I refreshed my memory respecting earlier efforts in this way, when benzoline vapour was used for the gas, and by the aid of little spirit lamps attached to the pipes the flow was kept up. This was Mr. Pumphrey, so well known in the photographic and lantern world. His experience was that a certain degree of success was obtainable, but definite conditions had to be fulfilled in order to prevent failure, viz., there must be no check to the flow in the way of cut-off or dissolvers, and that pipes once used for the inflammable vapour or gas should never be used for the oxygen gas.

This closely agrees with my own experience up to a certain point with the sulphuric ether vapour, when producing the limelight by oxygen and a saturator. Yet, with very carefully adjusted jets, having special size nipples and dissolvers specially made, dissolving with a biunial, and even a triple, lantern have been successfully employed.

I think I am right in saying that the ether saturators first became popular in America, and we are indebted in England to Messrs. Broughton, Ives, and Hardwich for the knowledge we possess of them and the improvements in design and make. The late Mr. Albert Scott worked with unflagging energy with both ether and gasoline to arrive at a certain and safe result, and by his statistics must have had a fair measure of success, for I have seen it stated only three out of about one hundred and fifty saturators sold required restuffing during a certain number of months.

My own experience is confined more particularly to the Broughton-Hardwich form of saturator, which I found answered perfectly well with single and dissolving-view lanterns if carefully constructed so as to ensure complete saturation of the gas by plenty of ether being available for the oxygen to pass over in the various sections of the lower chamber of the saturator; but I have also used the U form and single-tube saturators. The special jets were provided with pumice chambers below the nozzle and forming the mixing box of the jet, while, if jets not specially constructed were used, safety pumice tubes were used immediately behind the tap of each tube of jet, and a nipple not larger than one-twenty-fourth of an inch fitted to the nozzle. A forward pressure must always be maintained, and the cutting off of gas must be done from the oxygen at the tap.

The more recent forms of saturators connected with the jet and fitting in complete to the lanterns give a very good light, and from those I have seen in operation outside a lantern seem well under control, but I have not tried one in a lantern. Without doubt the great point to bear in mind when constructing is to have perfectly sound joints and washers, &c., so that no vapour can escape, and make the caps or washers of convenient form and so arranged that the filling is simple and certain. In the case of the tank it was made in two compartments divided lengthwise in the oblong copper vessel, the bottom portion being again divided into a number of compartments, so that the gas had to travel over a large area of ether in a zigzag fashion, and when saturated it entered the upper chamber. With the U and straight tubes, packings of flannels, wool, or sponge absorb the ether the same as benzoline is absorbed in the ordinary sponge lamps as used for domestic purposes.

Lawson's design of saturator and jet all in one seems very good; others following on the same lines permit of the oxy-ether light being produced satisfactorily in the lantern, if oxygen gas is available from a cylinder or bag.

The ether used must be methylated ether sulphuric of the best quality, either ·720, or, better still, ·717. The bottles containing it should never be opened near a light, and preferably in the open air, and the saturator filled by daylight.

There is one point that I do not remember to have seen mentioned in connexion with ether, and that is fire insurance. Is it not a fact that hazardous-risk rates have to be paid on houses, &c., where ether, naphtha, &c., are used, such as photographers', chemists', waterproofers', &c.? and, if so, private dwellings may be so affected if the companies are acquainted with the fact of frequent use of sulphuric ether.

For and Against the Oxy-ether Light.

For.—Portability; requires less attention after once set; does not pit the lime; economical in comparison; requires only one gas, which can be made.

Against.—It has an unpleasant smell unless special care is taken; is more dangerous if proper precautions are neglected than the oxy-hydrogen light; is likely to affect the insurance of premises where used; is not a suitable light to put in inexperienced hands.

After summing up the *pros* and *cons*, I still prefer to work with oxygen and hydrogen in separate vessels under pressure when they can be obtained, as the cost of the hydrogen can be taken as very little more than the ether, and the initial cost of the extra cylinder and regulator is not a serious increase on that of the saturator or special jet.

Great care will have to be exercised in the construction and testing of the combined jets and saturators if the usual cheapening process goes on with these as it has done with ordinary jets, for somewhat more serious consequences will arise than the melting away of mixing boxes and other parts of some of the low-priced (but not cheap at any price) jets that are on the market, and which very often fail at the critical moment of use.

The aim of all lanternists should be to have an apparatus that can be worked in the dark without hitch of any kind, and, above all, *noiselessly*. This, with the better patterns so well known, and properly arranged regulators for compressed gas, is reduced to a certainty, and no alarm is created in any way.

G. R. Baker.

THE SEARCH LIGHT.

HYDROXYL-MONOHYDRIDE has possibly several other uses besides forming an excellent addition to the developer, as recently pointed out by that profound *savant*, Dr. Burton Coxe. On several occasions lately I have experimented with its constituent parts on lime cylinders in the lantern, the result being a wonderfully good light. I proceed in this way: When the lime is placed in the jet pin I kindle a jet of commercial phlogiston (which, as is well known, is contaminated with several hydro-carbon compounds), and bring it into contact with the lime. When the latter is thoroughly warmed I introduce to the flame a jet of dephlogisticated air, which, when the necessary adjustment of pressure is made, gives a capital light. Although there may be a certain quantity of hydroxyl-monohydride formed, I cannot definitely say that it is the case. To make sure of it, however, all that is necessary is a little admixture in accordance with the reaction :—

$$2\,H + O = H_2O.$$

The action is complete when the dephlogisticated air is mixed with several volumes of the pure phlogiston, and the mixture properly exploded. Then hydroxyl-monohydride is undoubtedly present, and the audience may be astonished by a chemical experiment of a peculiarly impressive character.

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Dr. Burton Coxe is more fortunate than the majority of chemical investigators, as I see that, within a fortnight of the publication of his discovery, a reward was offered to the person who was public-spirited enough to communicate particulars of it to the photographic press. It seems to me that the Doctor himself is more entitled to the five pounds than anybody else, and I hope the offer will be amended accordingly. In these commercially minded days it is not everybody who gives the world the benefit of his experimental researches, and not only clearly indicates the nature of the substance he is referring to, but also gives the reader simple directions for making it himself. My one complaint in the matter is that the discovery was not communicated to all the photographic papers instead of to one, which appears to value its unique privilege of exclusive publication very little. Some people are never satisfied.

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It is a fortunate thing that the cause of the Bradford calamity has been discovered by Professor Goodman to be an unannealed piece of metal, otherwise there might possibly have been a little room for uneasiness among users of gases in high-pressure cylinders. As it is, that gentleman's admirable report, coupled with the Brin and other Companies' highly sensible determination to reanneal all cylinders in future, should be instrumental in restoring confidence. What a lot of timid, hysterical old women in trousers there are in this world, to be sure! Some of the letters which have appeared concerning the Bradford accident are simply the outcome of an unreasonable panic. Caution is commendable, but cowardice is pitiable. The gentleman who the other day announced he had given up lantern work altogether because, I suppose, of the "danger" of compressed gas in cylinders, is certainly on the safe side, but I fear, if he carried out such a policy in all the affairs of every-day life, he would court an eternity of misery.

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Next Monday night the Photographic Club hold a children's entertainment at Anderton's Hotel, when, I believe, an amusing programme and some "goodies" will be provided for the young people. Doubtless the lantern will be requisitioned for the purpose of showing a few effect and coloured slides. Small children, as a rule, are not much impressed by slides of purely photographic or pictorial interest. I think the example of the Photographic Club deserving of imitation by other Societies, many of whom show great attention to the ladies in respect of an annual entertainment, entirely forgetting the equal, if not superior, claims of the little people who, to my thinking, possess the greater title to a little gratuitous amusement.

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On January 23 the Technical Meeting of the Photographic Society of Great Britain will be devoted to *Lantern-slide Processes*. It is hoped that all the current and some of the past processes will be illustrated. The Secretary states that he will be glad to hear from any one who can contribute specimens or illustrations.

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Has Mr. John Anderton's method of stereoscopic projection yet been utilised at theatres or music-halls? The other day, in an account of the performance of a young lady serpentine dancer, a newspaper critic said that, besides the usual limelight effects, a stereoscopic effect was produced on the dancer's drapery. Would it be too uncharitable to suggest that that writer must have "seen double?"

RADIANT.

THE DEVELOPMENT OF PRINTING-OUT CHLORIDE PLATES.

ALTHOUGH the application of development to the ordinary printing-out papers of commerce promises to form one of the most useful novelties of the past year, it will probably prove that, as applied to the same kind of plates in use for lantern and other transparencies, its advantages will turn out to be even greater. I say this in spite of the fact that during the dull weather at present prevailing, and likely to do so for some weeks to come, I have had very practical experience of the great utility of development instead of printing out, though, perhaps, the advantages accruing in the case of glass are of a different character to those in the case of paper.

So far as paper is concerned, the chief gain is, no doubt, found in the great saving of time, it being possible to get off several prints in the course of a working day by development where it would be impossible to print out even one. But I may remark, incidentally, that there is another advantage, which not only ranks very near to the saving of time, but may actually prove, in practice, of even greater importance. It has been noticed at most of the meetings at which the development process has been demonstrated that the results have been "quite," or "at least" equal, and in some instances "perhaps superior" to those produced on the same paper by the direct method, and my own experience is quite in the same direction, so far as quality is concerned.

But, more than this, equal results can be got with greater certainty and with a decreased expenditure of gold, provided, of course, that the exposures given are within the rather broad limits of the latitude permissible. It is perfectly absurd on the part of interested parties to say that gelatino-chloride paper requires no more gold than albumenised. I have worked experimentally and otherwise for seven or eight years with gelatino-chloride papers of various kinds, and during the past twelve months or more have used little else, and to get as good results I have to use at least twice as much gold. Several years ago, I think it was, Mr. W. K. Burton set down the quantity necessary at more than that, but the papers have, perhaps, improved since then. It is true a sheet of the new paper—gelatine I mean—can be toned in a fashion with a grain of gold, and so we have heard in years gone by of toning albumenised paper with a quarter of a grain to the sheet, but one champion of that system who tried to convince me with specimens would have come nearer the mark if he had omitted toning altogether.

The fact is, that if gelatino-chloride emulsion, whether on paper or glass, is, when printed right out, to be toned with anything like a grain of gold to the sheet, the makers should add to their instructions the little bit of advice given in a leading article a few weeks ago, to soak the prints in salt before toning. But that adds somewhat to the trouble, and makes the instructions look more formidable. Yet it, in reality, saves the trouble, and, in the long run, gives a far better percentage of good work.

I have, however, been led into a digression; but I want to suggest that, under the combined influences of the conversion of the organic silver salts into haloids and the production of the image by development instead of by printing out, the deposit is far more easily toned, and consumes less gold, and this is especially the case when bromide is used, possibly because, in a given time, the conversion is more completely carried out. The developed image itself is far more amenable to gold toning produced by printing out on any organic silver compound, whether formed in collodion, albumen, or gelatine.

and it varies in the order of the strength of the organic reaction. Thus a developed collodion transparency would be nearly bleached by a solution of gold that would scarcely touch an albumen print, and certainly would have no effect on a gelatine one.

But, to turn to transparencies on printing-out emulsion, which for that purpose has been in use some years longer than paper, but has never gained a wide popularity, on account of its comparative insensitiveness and the difficulty of correctly judging the progress of the print without special frames. As to the quality of the results obtained with gelatino-chloride plates, not the most ardent of collodion supporters (amongst whom I still rank myself) would deny them a foremost place; and, if the ease with which any kind of tone, from the warmest and brightest reds or browns to the coldest and "steeliest" of blues and greys, can be obtained, is taken into consideration, perhaps, no other process but "carbon" and Woodbury can enter into competition.

It must be kept in mind that the colour by transmitted light is far more easily managed in a transparency than in the case of the image by reflection as in a print. A transparency that shows well on the screen or when held up to the light does not necessarily show a good colour when pressed on a sheet of white paper, as I dare say others have discovered. In the course of my experiments in years past, I have had frequently emulsions that literally refused to tone when spread upon paper, and which yet changed in the same gold bath to passable, or even really good, tones on glass.

Bearing in mind, then, the shortened exposure and the greater ease of toning, it seems probable that an extended sphere of utility and a large share of popularity are in store for the print-out gelatine plate, while the difficulty of judging the exposure in an ordinary printing frame, if not altogether removed, is so reduced as to be practically non-existent. It has been said in connexion with paper that the length of the exposure, or the depth of the visible image, is of little importance so long as it is sufficient, the proper depth being obtained in development. So with the transparency, provided the details are visible, which is easily ascertained by examining the back of the glass, the rest is done in development. In fact, I think transparencies on print-out emulsion are more easily developed than those on bromide films, and certainly than paper prints, while the tone, or range of tones, is far superior to those on bromide.

I have not had sufficient experience with the commercial plates to be able to say anything about their peculiarities, if they have any; but I do not suppose, judging from commercial papers, that the emulsion used varies very considerably from what one prepares at home. That consists, I will assume, of gelatine containing chloride of silver, together with the same metal in organic combination, and, to a very slight extent, in the free or soluble state. It may be acid, or possibly neutral, or even alkaline, but most probably the first This is a pretty broad description, and covers, I think, every kind of emulsion I have worked with with any degree of success.

I may first say the plates require to be very carefully kept, more so than the paper, especially in the matter of protection from damp. The absorbent nature of the paper causes it to take its share of any moisture that may get to the film, which is not the case with glass, and if the emulsion contains any appreciable quantity of hygroscopic matter the result of exposure to the ordinary atmosphere of the present season will often suffice to form beads of moisture on the surface of the glass film. Therefore, before proceeding to place the plates in the printing frame, they should be gently warmed in order to ensure their perfect dryness.

Unless the electric or other powerful light is available, the printing will be done by daylight, but even at this time of the year it is not unnecessarily protracted. All that is needful is to secure a faint visible image of the complete picture, except perhaps the very highest lights; in other words, a rather lighter image will do for the transparency than would be advisable were the print on paper. In a fairly clear light without sunshine, several prints can be obtained from the same negative in the course of a December day.

After printing, it is important, I think, to immerse the picture, whether on glass or paper, in water, and preferably soft water, before transferring it to the bromide solution. This abstracts most of the soluble matter, especially free silver and any soluble organic salts that may be present, and leaves the bromide bath less liable to contamination and exhaustion, and also prevents the formation of a scum of bromide of silver on the surface, as sometimes occurs. Two or three minutes' soaking in a moderate volume of water, followed by a brief rinse under the tap, will prepare the plate for the bromide.

The strength of the bromide solution does not appear to be very material so long as it is strong enough to act in a moderate time, but a fairly prolonged immersion is a necessity, not less than fifteen minutes, to keep the lights of the transparency clear. I have used 20 grains to the ounce, "1 part in 20," which is not very different, and for the sake of experiment four times as strong, or 20 per cent.; but the lengthened immersion seems quite as needful with the strong solution as with the others. After immersion in bromide I think it decidedly necessary to wash the plate for a minute or two, and not to put it, as I have seen done, directly into the developer, which leads to want of uniformity.

With regard to development, space does not permit me to even touch on a subject that would require an article to itself. I suppose each operator will have his favourite developer; mine is either metol or amidol, well kept back with bromide. The action should be carried as far as possible without veiling the lights, as, owing to the extreme fineness of the deposit, the image is otherwise apt to be too transparent and wanting in force.

If, after development, the plate be very thoroughly washed, it may be toned with almost any gold solution that is not too strong. I have used a bath of phosphate that has been almost exhausted for gelatine paper, and it has answered as well as a new one; but, where only two or three transparencies have to be toned, a few drops of plain chloride of gold solution, poured into an ounce of water, will do as well as anything. This, of course, is only for transparencies. Fix in weak hypo, and wash well. W. B. Bolton.

PROJECTED PORTRAITS.

V.—Dr. P. H. Emerson.

A little to the east of London Bridge, and on the north bank of the river Thames, there is a commodious structure devoted to the reception and distribution of large quantities of that unromantic but otherwise irreproachable necessary article of food, generically termed Fish. Besides this purpose, Billingsgate—that is the place to which I refer—serves another object, possibly less useful, certainly as interesting. It disputes with the universities the honour of wielding some influence over the English language, and is popularly supposed to have imparted to it a certain rugged freedom of expression, picturesqueness of form, and forcibility of utterance. The literary and controversial style of Dr. Emerson irresistibly suggests the possibility of his having passed some time in the study of piscivorous philology at its fountain source. By the rediscovery of a forgotten canon of photo-focussing, which laid down that only the principal object in a picture need be well defined, he is said to have given great impetus to the growth of pictorial photography. The many-headed, however, with its usual fickleness and perversity, prefers to ascribe the hideous plague of impressionistic smudges now afflicting the photographic world to Emerson's teaching, the word "Emersonian" being applied to anything sufficiently blurred and fuzzy to be cast on the "artistic" dust-heap. Poor innocent doctor! Besides *Naturalistic Photography* (a good, if eccentric, book), which he "renunciated" on account of a tiff with Mr. George Davison, whom he treated to a fine sample of Lower Thames-street Saxon, Dr. Emerson is the author of several works depicting life on the Norfolk Broads, where he passes a deal of time. He has had the pluck to wash his hands of the Camera Club and its shamateurism. He is a member of the Photographic Society of Great Britain, but is rarely seen by the profane. This Grand Llama-like retirement invests him with a degree of mystery which is effective—and perhaps useful. He was one of the Judges of the late Pall Mall Exhibition, and is said to have led his colleagues by their respective noses. The awards were so funny that he must have also blindfolded them. Most people imagine him to be a choleric fire-eater, with a chronic liver complaint and the ferocity of an Afghan. He is said to be a mild man, in whose mouth butter would not melt.

VI.—Mr. A. L. Henderson.

Whenever I contemplate the leonine head of Mr. A. L. Henderson I am reminded of the late Dr. E. V. Kenealy (the Claimant's friend), who on a memorable occasion compared himself to a lion shaking the dewdrops

from his mane. The two are much alike. Mr. Henderson boasts possession of the same philosophically calm bearing, the gentle lamb-like demeanour in debate, the restraint, the serenity, the sweet reasonableness that might have been more conspicuous in Dr. Kenealy. In King William-street, City, Mr. Henderson for many years carried on business as a portrait photographer, with the most agreeable results to himself, and, let us hope, to his sitters. His principal delight was to defy the civic authorities in their prohibition of Sunday work, and cheerfully submit to a weekly penalty for his amusement. Some people might call this vindicating the liberty of the subject; others, in a whisper, *réclame*. He gave much attention to burnt-in photographs on enamel, experimenting a great deal with the process, practising it extensively, and teaching others. Nevertheless, he will probably carry the secret of his own particular method of working with him to a place where it will not be wanted. Mr. Henderson often won the smiles of Gracious Majesty for his professional skill, which proves that the Sovereign is a kindly critic. He founded the London and Provincial Photographic Association, and, if current legend is to be trusted, the early days, or rather nights, of that useful Society were simply pale, miserable imitations of the memorable meeting on the Stanislaus described by Truthful James. To hear (and see) Mr. Henderson talk photography at a meeting is to experience a variation of the temperature of the apartment from 32° to 150° Fahrenheit, and from 150° to 32°, half a dozen times in the course of an evening. Mr. Henderson has long since retired from active work, but still dabbles a little in photography. He travels about a good deal, and at the present time is elevating the temperature of the Engadine by talking photography there. Success and leisure, however, have not spoiled him, as his heart remains in its right (and proper) place.

VII.—Mr. John Howson.

From Mr. Henderson's heart to Mr. Howson's heart may appear a not very obvious step, and yet the transition on this occasion is as natural as it is easy. It is related of a former Queen of England that she was wont to say that at her death the name of Calais—which the French had re-won from this country—would be found inscribed on her heart. I have not the least doubt that if my excellent friend, Mr. Howson, were to join the majority—an extremely remote event, let us hope—there would be found on his cardiacal organ the impression of a little ship upon the sea, flying a flag bearing the strange device, "Ilford"—the Britannia Company's trade mark, in fact. Mr. Howson's devotion to the fortunes of the great Company at Ilford is Napoleonic in its sleeplessness, while his faith in the good qualities and cheapness of its various productions amounts to a religion. Equally as well developed as his commercial faculties are Mr. Howson's powers as a demonstrator of the properties of isochromatic plates, printing-out papers, &c. The enthusiastic conviction which underlies all his technical utterances, written and spoken, extorts admiration even from his rivals. He is at his best when encountering a pragmatical questioner, for a disinterested spectator of the duel then gets the opportunity, not frequently available, of contemplating a single-minded man with one idea, which he pursues with unflinching steadiness. Of such is the kingdom of Ilford. To his many well-polished and agreeable social qualities Mr. Howson adds the important but uncommon trait of patronising a good brand of cigars.

VIII.—Mr. Andrew Pringle.

Nature designed Mr. Pringle for a professional humourist, but he thought he knew better, and so, preferring cracking heads to cracking jokes, became a Son of Mars. The magnetism of the pen that is mightier than the sword soon attacked him, however, and, relinquishing the camp tent for the dark tent, he turned photographer, and ere long plunged into photographic journalism. Nature was avenged. If the army's loss could be calculated from photography's gain, Mr. Pringle should, ere this, have achieved the crown of military immortality. He has done a great deal of photo-experimental work, and has written voluminously upon it in a trenchant style streaked with fun. In photo-micrography he, a few years ago, discovered a new field for his many-sided inclinations, and, being nothing if not thorough, he has rightly secured a distinguished position among photo-microscopists. He is a Fellow of the Royal Microscopical, Member of the Camera Club, Vice-President of the Photographic Society of Great Britain, belongs to several other Societies, and is entitled to put J.P. after his name. He is as good a speaker as he is a writer: being a man of clear ideas, painstaking, and easily understanded of his readers and auditors. Personally he is the essence of geniality, a doughty foe in controversy, and fond of a joke, so much so, that at times it is difficult for him to be serious. He is a possible President of the Photographic Society of Great Britain. He has recently given way to writing about art photography, which is a bad sign, being a prelude to a descent into Fuzzyism. Still, while he sticks to high-power micro work, there is hope of his (photographic) salvation. Limelight.

(To be continued.)

THE ARC LIGHT FOR THE LANTERN.

While the great convenience and portability of compressed gases has led to their almost universal use for the optical lantern, the spread of electric supply may, in the end, inflict a severe blow upon their employment. With all the advantages which the limelight possesses, there is no doubt that even at the present time, when so little has been done, comparatively speaking, in England in the way of a cheap supply of electricity, the arc lamp is growing in popularity as the illuminant.

There are at the present moment two methods in which current is supplied commercially, the alternating and the continuous; and, as these necessitate, in some respects, widely differing apparatus, it is necessary to consider them separately. In the case of an alternating current, there are no positive and negative poles, roughly speaking, or, to be more accurate, the two poles are incessantly changing from positive to negative, and back again, the direction of the current being changed many times per minute. One of the chief advantages of the alternating system lies in the ease by which the potential can be varied by means of what are called transformers—a very important point, when it is remembered that an E.M.F., or potential, as it is called, of much over 100 volts is not convenient for ordinary house-lighting with incandescent lamps, nor, indeed, very safe, while, for economic distribution, it is recognised generally that a potential of 1000 volts is more suitable for the distributing mains. Both these requirements can be easily fulfilled with an alternating current, the dynamos at the generating station maintaining in the mains an E.M.F. of, say, 1000 or 2000 volts, as the case may be, while the leads in each house or group of houses are fed from a transformer, which reduced the potential to the required figure, that generally employed in England being 65 or 110 volts or thereabouts. These amounts have been fixed upon with a view to arc lighting, for, while incandescent lamps can be, and are, made to run on circuits of any E.M.F. from 20 volts to 130, or even beyond these amounts, an arc lamp requires a certain definite potential at its terminals for it to run satisfactorily. This potential lies between 50 and 60 volts (39 volts is the actual theoretical minimum), and it will, therefore, be seen that, if the current is supplied in the house at 65 or 110 volts, in the former case one arc lamp can be run, and in the latter two, on such a circuit.

In the case of the continuous current supply, there is a definite positive and negative pole; the potential is generally the same in the mains as in the house leads, and is frequently the same as those mentioned above, viz., 65 or 110 volts. Most forms of the arc lamp, with arrangements for the automatic feeding forward of the carbons, are constructed specially either for a direct or alternating current and cannot be used indiscriminately, but that style of lamp most suitable for projection purposes does not possess this disadvantage to so great a degree, being hand-fed.

Supposing, then, that there is a supply of current to the house, it is first necessary to consider whether it is alternating or continuous, and at what potential it is supplied, and this must be done before a suitable lamp can be obtained. A hand-fed arc lamp is not an expensive instrument, the way in which it acts being far simpler than in the case of the automatic lamp. Perhaps at some future time I may, with the Editor's permission, give a sketch and sufficient details to enable any one of a mechanical turn to construct one himself.

The arc light is obtained by sending the current through two carbon rods, one end of each being connected to the two terminals respectively, the other ends of the rods being in contact. As soon as the current passes, the two rods can be separated to a certain distance, when it will be found that the electricity can pass over a certain air gap between their ends, and, in doing so, causes them to emit that dazzling light which is familiar enough to the dwellers in most big towns. As the light is kept burning, it will be found that it is necessary to bring the rods a little nearer together from time to time, as they will gradually burn away at the arc.

It is for this purpose, and also for separating them when lighting up, or "striking the arc" as it is termed, that in the automatic lamps mechanism actuated by the current itself is provided. In the hand-fed lamps, as their name implies, this is done from time to time by the operator.

The correct distance between the ends of the two rods, or the two poles as they are generally termed, is about three millimetres when the lamp is burning most efficiently. If the poles are too near

together, they obscure the light of the arc, and do not work either so economically or well; if they are too far apart, the light loses its intense whiteness, and there is a great probability of it going out unexpectedly, and necessitating the poles being brought into contact again. The heat emitted by the arc lamp, although comparatively nothing like so great as that of the oxyhydrogen jet, is, nevertheless, an important matter for consideration, since there is a great temptation to employ very much more light when using the arc. It has been calculated that an arc lamp of from three to four hundred candle power emits heat equal to three horse power.

The actual amount of light emitted by the arc is a very variable and uncertain quantity. When it is burnt vertically, as in the ordinary street lamps, a continuous current lamp emits the greatest amount of light in the direction of a line passing downwards from the centre of the positive pole at an angle of 60° with the horizontal. An alternating current lamp, on the contrary, is most brilliant in a direction almost horizontal, the angle not being more than 15°. In order, then, to get the most brilliant light in a horizontal direction, it is necessary to tilt the lamp, the actual amount of inclination given to the carbon being generally about 30° from the vertical.

The best way of coupling up the lamp to the mains is by having a switch and coupling attached to the switch-board of the house, or fixed in a similar convenient position. This should be done by the supply company, or by a competent electrical engineer. From this coupling two wires suitably insulated can be led to the lamp. The most convenient form which these wires can take is what is known as concentric cable. This consists of a number of wires twisted together and covered with a suitable insulating material, forming one lead, and on the outside of this another series of wires are laid forming, in section, a ring surrounding the first, and insulated from it, this ring forming the other conductor. Over this second layer is put more insulation, the result being a circular cable, which will stand an enormous amount of knocking about, the outer conductors being not only well protected themselves but forming an armour for the protection of the central cable and its covering. Lengths of this cable can be purchased attached to couplings, which need only screwing into a socket to connect up both wires. The two ends of the cable coming to the lamp must be connected, one to one terminal of the lamp itself, the other to one end of a resistance, which will most probably have to be inserted in the circuit. The axes of the two carbon rods should not be coincident when a tilted lamp is used and it is desired to send the maximum amount of light in a horizontal direction, supposing a continuous current is employed. It has been found by experiment that, under such circumstances, the top carbon (positive) should be a little behind the other, the axis of the lower or negative rod being in a line with the front edge of the upper. It is, moreover, very important in the case of arc lamps used for projection purposes that the very best carbons should be obtained or the light will not be steady. With an inferior quality of carbon, spluttering and hissing is sure to occur, and mushroomlike growths form on the negative pole, which obscure the light until they break off or are burnt away, when the hot portions damage anything on which they fall. I have seen beautiful and expensive Mangin lenses, fifteen and eighteen inches in diameter, full of little specks of carbon which have spluttered off the lamp and melted their way right into the glass. This is especially a danger in the case of the optical lantern, because, with the short focus of an ordinary condenser, the arc is so much nearer the glass that there is a much greater chance of particles being projected on to it. Hence the necessity of using the best carbons obtainable, with which all danger of this kind is avoided.

JAMES LEWIS.

LANTERN MEMS.

THERE is still a little trouble in the air as regards steel cylinders for compressed gas, and those lanternists that have the same make as the one that came to grief at Bradford must be patient, and for the present consent to let them remain idle, for the Gas Compression Companies will not fill them until the results of some further tests are known. As far as possible, the London Company and opticians who stocked and sold this make are aiding their customers with the loan of cylinders, but naturally, at a busy time of the year like the present, the number available for the purpose is limited, for the trouble came just when arrangements for the ordinary season's demand were completed, and not for the abnormal requirements that have ensued.

I WAS very pleased with Mr. Jackson's letter in last week's JOURNAL, and quite agree with him that useful lessons are learnt from misfortunes, or ought to be, and, in the sad instance of Bradford before us, the experience will prove that *sound* precautions will be taken, not only in the selection of steel, testing and filling cylinders, but in the annealing and reannealing from time to time, and when the railway companies decide the matter finally, transit also will not have been overlooked.

* * * * *

THE ingenuity displayed in the protection of cylinders while travelling is, in some cases, clever, and in others decidedly amusing. Among the former are the rope casing after the style of that used on steamers for the pads to reduce the jar when arriving at a pier, and strong rubber rings round the cylinder in three or four places, while that which raises a smile is to see an old violin case opened, and out of it taken a ten-foot cylinder. It was a necessity to hide the identity of the cylinder, for one of the railway companies had given orders for no cylinders to be allowed on the station, and a man carrying one had to leave the premises without being allowed to get in the train and go the proposed journey. Any one now going with lantern apparatus by passenger train must be careful to pack his cylinder in a box, leather case, or other covering that will not only protect it, but prevent it being recognised, if he wants to ensure a supply of gas for the entertainment. Where practicable, it is suggested that the gas shall be sent to the place beforehand by goods train, but, of course, plenty of time must be allowed for this.

* * * * *

ONE often sees the power of a light stated at so many candles' illumination, and a fair approximation can, no doubt, be obtained by the ordinary photometer where the light to be measured is only of ordinary intensity; but with powerful lights like the lime and electric it is a very difficult matter, because there is no such thing yet found as a unit of measurement that can be considered standard, so for lantern work the only practical way is to have two similar optical systems, and the lights used respectively placed in each with half-opaque slides or apertures in the stages, so that one half of the screen is illuminated by one light and the other half by the one with which comparison is desired.

* * * * *

HAVING been told that a certain oxy-ether saturator and jet was more powerful than the best oxy-hydrogen jet, I was naturally interested in it, and gave it a fair trial; but, notwithstanding that I tried to get the best results from it, I could not get as bright a disc from it as from a modern jet with improved nozzle and mixing-box. This leads me to the point that I have always emphasised—that there are jets *and* jets, as well as three and four-wick lamps of very unequal performance.

* * * * *

EXPERTS, of course, know a good jet when they try it, but so many men look only to low prices and superficial appearance that they think they have the best when probably they have only a second or, perhaps, a third-rate article, and it is only by some comparison such as mentioned above they are apprised of the fact.

* * * * *

IN a trial of lamps recently the difference in the same make of both three and four wicks was recognisable, but between the same size and number of wicks in lamps of *different* make was considerable; therefore a picked lamp from a batch would be hard to beat, whereas an average or poor lamp from a batch would be easily overpowered. The only way, therefore, in a trial of lamps, and before replacing "old for new," is to have them side by side under similar conditions each in the hands of its advocate.

* * * * *

IT has been said "you cannot expect to get as much light from a three-wick lamp as from a four," but for all-round work in optical lantern projection my opinion is that, in nine cases out o ten, the three-wick is the most satisfactory as giving less trouble, less heat, and a more general illumination and flatter field.

That electric light will shortly replace the limelight for lanterns where the current is on is now beyond doubt, for with the new small electric arc lamp perfected and on the market, every lanternist can at a small cost be in possession of a splendid light that gives no trouble, and is equal, if he so desires, to more than double the power of the limelight, while with suitable resistance he can make it less should it be necessary. Mr. Davenport's demonstration at the Camera Club on December 21, put the satisfactory nature of the light beyond question, not only for the simplicity of its working, but in the generally excellent effect of the photographs projected.

* * * * *

Lanterns are coming to the front everywhere, for not only must all the learned and technical societies be provided with or have access to one, but also the large halls, clubs, &c. And now, to crown the matter, the directors of the Imperial Institute have organized a series of illustrated lectures, which have, so far, been most successfully attended, and been the means of diffusing information respecting our Colonies that cannot fail to be of value. In such places as this and the People's Palace, and other buildings of large dimensions, the advantage of an electric arc lamp that can be used in a biunial or triple lantern will be much appreciated.

* * * * *

Vertical attachments to lanterns, and convertible lanterns for using slides horizontally, are becoming the rage; and, when it is seen how simple the manipulation of an electric vertical attachment lantern is for all purposes, more will be used. I was charmed with the simplicity of the whole arrangement as used by Dr. Fleming at the new Electrical Laboratory Theatre at University College, Gower-street, for diagrams from photographic transparencies could be shown on a nine-foot screen in broad daylight, and all magnetic and many electrical experiments conducted in the easiest manner, there being plenty of room between the condenser placed horizontally and the object on the gallery or stage above it. The condenser used was of triple form and specially constructed, much on the same lines as described in this Journal in connexion with a science projection lantern, so as to get a comparatively short focus for its diameter with good definition; the two lenses next the light being in a vertical position, and the third horizontal, the latter forming the foundation of the stage.

G. R. Baker.

RECENT NOVELTIES IN LANTERN APPARATUS.

The "Cito" Lantern.

Platt & Witte, Birkbeck-road, Ridley-road, Dalston, N.E.

The principal feature of the "Cito" lantern is its compactness. It is of the now favourite portable kind, and packs away into a small compass.

The camera front is constructed of two wooden frames, leather bellows, side plates, set screws, and rack and pinion; this being used to work the back close up to carrier, thus holding it firmly in position, having a set screw at other side, to prevent running back. The lens front slides backwards or forwards, and is fixed with a set screw. It has a double-pinion jacket to take cylinder lenses, thus enabling the operator to work at any distance from screen, and to get any size disc. A small brass table is also supplied for science purposes, which can be heightened or lowered by means of a screw, and at the same time can be put at any distance from the lens.

The box is made with an adjustable strap handle. The top can be canted to any height. The front is made to fall down, which forms a table. The legs are made to detach, which enables the whole set of apparatus to be packed in a box, together with about two hundred slides.

The "Lothian" Educational Lantern.

A. H. Baird, 15, Lothian-street, Edinburgh.

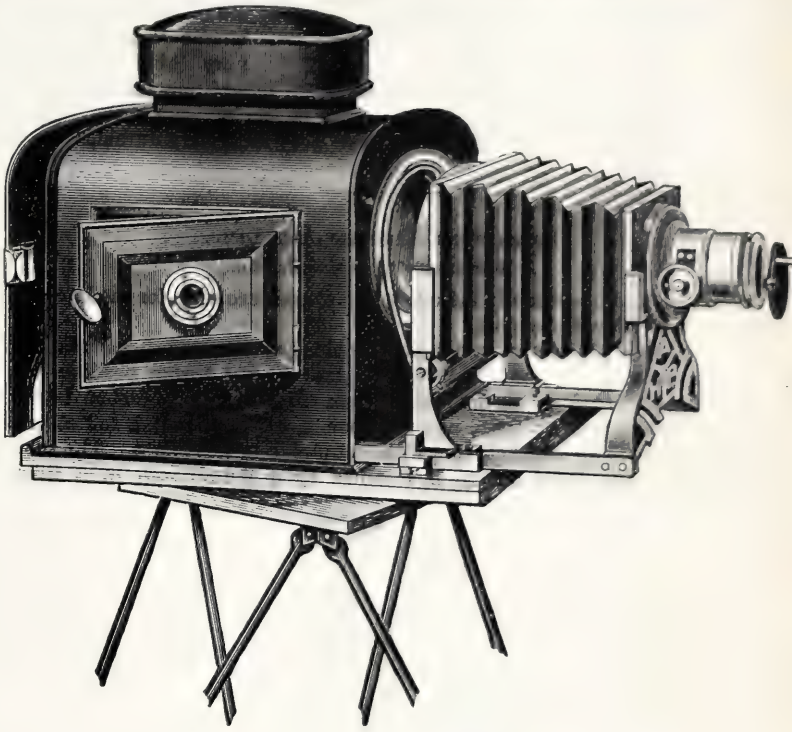
This lantern appears to have many advantageous points. The body is made entirely of sheet metal riveted throughout with copper rivets. There is ample space allowed, so that the O.H. burner is not used within restricted limits. The condenser is fitted into its socket by means of a bayonet joint; this, no doubt, avoids all risk of its falling out during transit. The stage is of an open pattern, admitting slides of any size into position from either top or sides.

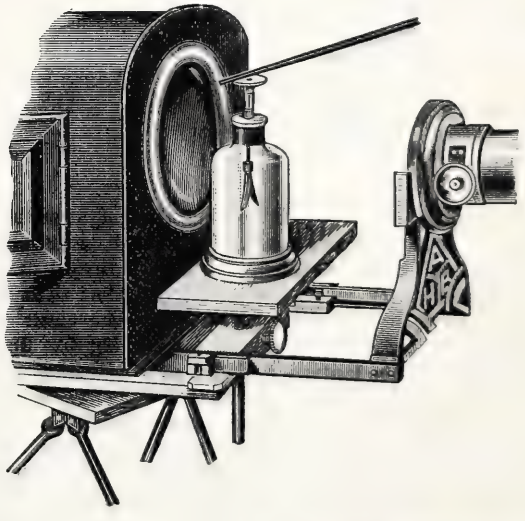
The rough focussing adjustment is effected by means of sliding metal bearings; this method is said to be smooth, exact, and rigid at all points.

The front being of the bellows pattern, admits of great extension without any undue weight being added. This prevents the lantern from being front-heavy, and keeps the lenses in optical centre.

For solid projection the bellows frame, upright supports, and stage clips are arranged to be taken right out, thus leaving a clear open space between the condenser and projection lens.

Mr. Baird has sent us a specimen "Lothian" blocking-out slide-carrier for biunials—a neat and useful carrier which obviates the result produced





by the incandescence remaining in the lime after dissolving, which still shows a faint image on the screen of the picture just passed; also a sample metal-bound cardboard box for strong lantern slides, which should be useful for the purpose.

The Chadwick Reading-desk and Lamp.

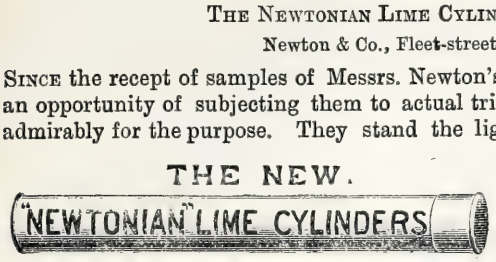
W. I. Chadwick, St. Mary's-street, Manchester.

In this arrangement for lantern lecturers, the stand is made of brass tubing, which folds up into a small space. When set up for use it supports a lamp which is made to burn a carriage candle. The desk is hooked on to the front of the lamp; when removed it folds into a small space. A curtain screens the whole arrangement from the audience. Lantern lecturers, no doubt, find Chadwick's desk and lamp serviceable.

The Newtonian Lime Cylinders.

Newton & Co., Fleet-street.

Since the recept of samples of Messrs. Newton's new limes, we have had an opportunity of subjecting them to actual trial, and find they answer admirably for the purpose. They stand the light from a blow-through jet remarkably well, and admit of repeated use. They are cleaner and more convenient to handle than the ordinary kind. Messrs. Newton inform us that they find the limes exceedingly luminous, but "they require slowly heating before turning on the full force of the oxygen to avoid cracking. If well heated first, they seem very durable."

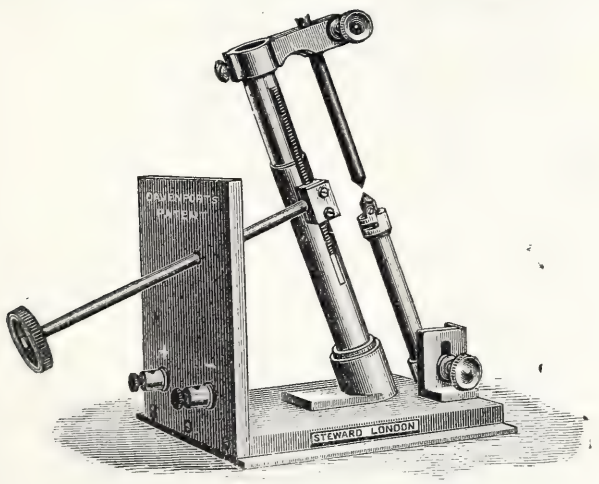


Davenport's Electric Arc Lamp.

J. H. Steward, 406, Strand, London.

Mr. Steward has recently introduced an electric arc lamp for the lantern, invented by Mr. Davenport.

The lamp consists of two carbon holders, so arranged that, while the lower carbon is automatically maintained in the proper position for burning by a spring with the lower carbon tube, the upper carbon is fed forward from time to time, as the carbon is consumed, by a rod at the back of the lamp attached to a rack-and-pinion arrangement. The tube containing the lower carbon is fastened by a thumbscrew to a fixed



upright plate, having a slot cut in it so that the height of the tube may be varied and other adjustments made. The two carbons are set at an angle, so that the full benefit of the arc is obtained directly in front. The lamp will fit any ordinary lantern without alteration, thus allowing of the limelight or other luminant being used when the electric current is not available. The rod-carrying pinion for feeding the upper carbon projects at the back of the lantern, and the only attention necessary in using the lamp is to turn this rod from time to time in a similar manner to that required when turning the lime for the limelight. Special connexions can be supplied for joining the lamp to the supply mains, which, while protecting the terminals from contact with each other, render it impossible to connect up the lamp in the wrong manner. The lamp is said to be perfectly steady in working, and to give a powerful light of great intensity, capable of being varied to a greater or less degree by suitable resistances. We understand that it has been successfully used at the Camera Club, Society of Arts, &c.

RECENT LANTERN PATENT.

PATENT COMPLETED.

Improvements in and in connexion with Projecting Lanterns.

No. 14,877. William Charles Hughes Brewster House, Mortimer-road, Kingsland, and Henry Woodruff, 336, Kingsland-road, Kingsland, Middlesex.—*September* 16, 1893.

The improvements in, and in connexion with, projecting lanterns constituting our invention consist, firstly, of an improved shutter or device capable of being connected to any and every kind of existing oxyhydrogen lanterns, without the need of any alteration being made to said lantern for the reception thereof, the purpose of which is to prevent the light that arises from the residual or partial incandescence that remains in the lime cylinder after the gas has been turned off from being projected upon the screen, and lighting up the dissolved picture, to the detriment of the next or following view. Secondly, of an improved slide-carrier, or holder, that has for its object a means for compensating any horizontal irregularities that may exist in the carrier-slide of the lantern, and for automatically preventing stray rays of light passing between the said slide and the carrier. Thirdly, of a method and means of constructing a single biunial or triple lantern, by which a greater space is provided for the escape of heated air than obtains in such lanterns as hitherto constructed. And, fourthly, of an improved box or holder for containing a set, or sets, of slides, when not in use, or for holding such in consecutive order for the convenience of the operator.

Correspondence.

CYLINDERS.

To the Editor.

Sir,—Some time ago I decided to purchase a gas cylinder, as, owing to a feeling that there was a certain danger with them, I determined to have, if possible, the best. After some inquiry, I got one from a firm who I thought were the best makers. The second time my cylinder went to be filled, a different one was returned to me, made, I have reason to think, by a different firm. The label I had tied to the cylinder had been removed, and it was impossible to get my own back. Twice since then I have had the same thing happen. The last time the cylinder arrived about one hour before I wanted it for an exhibition with a different valve, which my key would not fit.

As I see the gas companies are now going to anneal all bottles, and charge for doing so, I would ask whether they cannot in some way ensure the return of cylinders to their rightful owners, as it is impossible that one five or six years old, which perhaps has been filled twenty or thirty times, is as good as a new one only used two or three times? Could not the gas companies have them stamped, preferably while hot, with their name and a number, *e.g.*, Brin, 1234? The mark on the valve is no use, as it can be changed from one cylinder to another.—I am, yours, &c.,

H. G. M. Conybeare.

Ingatestone, December 22, 1893.

CYLINDER CASES.

To the Editor.

Sir,—In *re* the Bradford explosion, I have seen it suggested that the cylinders should be *cased*. Now, though I am not a "lanternist," I take great interest in all lantern matters, and it occurred to me that a sound case for this purpose would be of service in protecting the cylinders from damage and help to give some confidence of safety to lanternists and the public in general. I propose it should be made from a solid block of any suitable wood, with a hole turned out of its centre, just large enough to admit the cylinder for which it is made. The top, or lid, is a solid square block of wood, hinged to case, with a pad fixed so that it rests on top of cylinder; another small pad is fixed in the bottom of the case. The case should be bound in two or three places with strong hoop iron, and across top and bottom a clip fastening of some kind should be made to keep the lid fast. A handle should be fixed. A part of one of the arrises is chamfered out to make room for this handle, one such as are put on sides of packing-boxes. The cylinder never need be removed from its case except for refilling—two of them could rest on a stool or under the operator's table in safety. They may be painted in any unconspicuous colour. I do not presume to say that these cases will prevent the bursting of gas cylinders; but, I trust, wherever they are adopted, they will give ease to the minds of those in their vicinity in knowing they have the best available means of safety near them. I trust that the foregoing suggestions may be put to a practical test and not "found wanting." A patent padlock may be fixed to each case, the lanternist having a key to fit (all locks being alike), and, of course, a key for the gasworks also. This would prevent the cylinders being interfered with in transit.—I am, yours &c.,

December 5, 1893. Frank F. Weeks.

The American Lantern Slide Interchange.—The new season of the Interchange for 1893-4 began on December 1. The annual meeting of the Executive Committee of the Interchange was held at No. 361, Broadway, on November 21 and 22, when 1763 lantern slides were examined and run through the lantern. The Committee sat at one session, with the exception of an hour and a half recess, from 4.30 p.m. to 3 a.m. next morning. Nearly 900 slides were accepted as being of good quality and of enough interest for exhibition purposes. These have been condensed into nine sets, each averaging nearly 100 slides.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*February 2, 1894.*

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

The Lantern Nights of the Central Photographic Club are highly appreciated, large audiences attending them, among them being many persons, including several ladies, whom one is not in the habit of meeting at the lantern nights of the other societies.

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At the Lantern Society, on January 23, a series of experiments were shown illustrating the application of the lantern to scientific purposes. They consisted chiefly of chemical experiments, cohesion figures, capillary action, and development; also the decomposition of water by electricity. Other experiments with the Kaleidoscope and Cycloidotrope were exhibited, and the phenomena of polarised light explained by means of the Polariscope. Subsequently a series of most remarkable drawings, executed by Mr. Perigal with a bow pen fifty years ago, were shown and greatly admired.

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Following the able paper on *Gas Cylinders*, which Mr. Kenneth Murray read at the Central Photographic Club on Friday, January 18, a short but interesting discussion took place. Mr. W. I. Chadwick remarked that the Brin Companies were not the only people who filled cylinders, and, therefore, it was desirable to know whether the cylinders that had not come into these Companies' hands were safe. He stated that on one occasion he had a cylinder which had a bulge on it, and, upon returning it, the bulge was simply filed down. He also said that at another time he took a cylinder to a gas-compression company, and got 140 atmospheres in it. At the present time he had in his possession a cylinder containing 135 atmospheres. The gas in the latter cylinder was gauged by one of Schaeffer & Budenberg's gauges. Mr. Murray characterised Mr. Chadwick's statements as conveying grave charges, and promised that they should be inquired into. Mr. Warnerke and other gentlemen took part in the discussion, at the end of which Mr. Murray received a well-merited vote of thanks.

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Mr. James Cadett spoke in favour of instituting Board of Trade regulations, and, in the course of further remarks, incidentally stated that he was acquainted with a man who was in the habit of carrying about with him, and using, a cylinder containing mixed gases.

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Mr. G. R. Baker complimented Mr. Murray on his paper, and said that it had cleared up many points in an admirable manner. Answering a question, Mr. Murray said that when a cylinder was reannealed the valve was taken out.

After the discussion on gas cylinders, Mr. W. I. Chadwick showed on the screen several beautiful photo-micrographic slides, and, by the aid of diagrams, explained the advantages of a triple condenser over other forms. Unfortunately, the supply of gas had run short, which prevented a practical demonstration of the condenser in the lantern, and also rendered it impossible for him to properly show what was perhaps his most interesting exhibit. This consisted of the ordinary vertical attachment to the lantern, which, by removing the reflecting mirror, admitted of straight through projection, and also, when the mirror was placed at the requisite angle, with a bundle of glass plates, served to polarise the light, which is then passed through an analyser fitted on to the front of the box holding the vertical attachment. Thus the instrument serves three purposes.

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The technical meeting of the Photographic Society of Great Britain on Jauuary 23 was occupied with lantern matters. A lantern-slide box, having divisions instead of the usual grooves, and allowing of the bottom being drawn out, was shown. It is made by Mr. R. R. Beard, and it is claimed that the movable bottom allows of the temperature of the slides being uniformly raised and the ventilation being thorough. It was thought by some present that the partitions were unnecessary. Captain Abney, it was mentioned, was in the habit of putting his slides in an oven before an exhibition, so that they came to the room virtually warm.

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Apropos some commercial binding strips for lantern slides that were shown, Mr. H. Wilmer said that a friend of his used strips of white paper for the purpose made of bank-post paper coated with a mixture of glycerine and gum. Masks of a dark brown paper were employed.

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In illustration of lantern-slide processes, there were shown on the screen a number of slides by Mr. T. E. Freshwater on commercial lantern plates, wet plates, &c. Mr. Freshwater stated that Messrs. Newton's slides were made on wet plates, which were washed after leaving the bath and then coated with albumen. He observed that this gave a very transparent and durable film unaffected by temperature. The film was easy to work on with colour, and it took any medium or oil. Other slides shown included views of shipping and snow scenes by Mr. Wilmer; some Woodburytype slides of lunar pictures; examples by Mr. Chapman Jones, toned with mercuric chloride and silver cyanide. Speaking of the Hill-Norris lantern plates, Mr. Clifton said he had used a great many of them, and found that they were very rapid and were greatly affected by the temperature of the development.

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Especial interest attached to the slides shown by Mr. W. England. Some of these were made on tannin plates from instantaneous wet-plate negatives taken in 1857-8 at Niagara Falls, on the St. Lawrence, and in the streets of Paris. For the exposure of the latter a simple drop-shutter was used near the plate, and, comparing the results then obtained (now nearly forty years ago) with modern instantaneous work accomplished with the aid of phenome-

nally fast plates and shutters, it is no exaggeration to say that they are not one whit behind the productions of the present time either in technique or as examples of quick work. Mr. England also showed a slide of the 1862 Exhibition, several Swiss views, &c. Mr. Warnerke pointed out how well the slides (made between twenty-five and thirty years ago) had kept, and thought it a good way in which to preserve mementoes of a bygone period, as slides would be likely to be more permanent than prints.

CLEARING GELATINE LANTERN SLIDES.

Although the lantern slides of the present day upon gelatine plates are immeasurably superior to the run of those turned out ten years ago, it is still by no means an uncommon occurrence to meet with specimens which, without being absolutely bad, yet convey the impression that all is not quite as it should be.

Colour, gradation, and density may be all right—these are, in fact, the points that are absolutely necessary to be considered before the slide will pass at all; but there is an almost indescribable want of "tone" and brilliancy that entirely robs the picture of its quality. In ninety-nine cases out of a hundred this arises from the presence of an almost imperceptible veil, which pervades the whole picture, and deprives it of that clearness which is so essential to the beauty of a really good transparency.

The veil may, and does, arise from a variety of causes; it may be of the nature of fog, both chemical and from light, or it may be the result of over-exposure or over-development, and in very many instances it lies in the gelatine film itself, the latter being impregnated with salt of lime. Whatever may be the cause, the result is practically the same—the slide is flat and unsatisfactory, instead of being clear and brilliant.

In such cases the use of a clearing solution will, in the majority of instances, effect a complete cure, and, though it adds one additional operation to those involved in the production of the slide, it seems to me to be worth adoption. In the production of collodion slides it is the almost invariable practice to employ a clearing solution, and gelatine plates stand in greater need of such treatment than collodion.

For this purpose, such clearing solutions as alum and citric or other acids are only partly serviceable, that is, when the veil partakes rather of the character of a stain than of a deposit of silver or lime, and this is scarcely the sort of effect that I am alluding to. Where the fog consists of insoluble matter, it requires the application of an agent that will dissolve it, and the choice of that agent will, of course, depend upon what constitutes the fog. If it be lime, then hydrochloric acid will prove a cure; but if, on the other hand, deposited silver be the cause, that remedy is not available, but nitric acid must be used.

But neither of these acids alone appears to exercise much useful action, unless employed of such a strength as to endanger the safety of the gelatine film; but, if used in combination, they act much more powerfully, even in weaker solution, and the mixture is equally effective for every kind of veil. In the case of lime deposits, or mere development stains, the application of the clearing solution alone is effective, but when silver forms the deposit it is, of course, converted into chloride, and necessitates a reimmersion in the hypo bath. It is noteworthy that the mixture of acids or *aqua regia* effects a conversion of the veil into chloride, where hydrochloric acid alone would fail to do so unless applied of much greater strength.

Better, however, than the mixed acids I find a solution of common salt in strong nitric acid, which, probably, amounts to much the same thing. If a quantity of salt be placed in a bottle with some nitric acid, and left to dissolve, it will form a solution which only requires diluting to the proper strength for use, and which will act far more uniformly and gently, and at a greater degree of dilution, than either of the acids named alone.

W. B. Bolton.

At an early date Professor Vivian Lewes will, at the Society of Arts, read a paper on "London Coal Gas and its Enrichment."

LANTERN MEMS.

So gas cylinders are again to be conveyed by passenger trains, provided they are protected by wooden or hemp casing, the gas-compression companies having given an assurance of their strength by only allowing cylinders to get into circulation (as far as they are concerned) as shall fully meet the altered conditions of safety, and which have been certified for weight, pressure test, and annealing.

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Mr. Murray, in his paper on *Gas Cylinders*, gave some very interesting details, that should reassure users of compressed gas, for he showed that, when made from suitable material, and periodically tested to one and a half ton's pressure, and properly annealed, a fall of fifty feet could not, or rather did not, affect their strength and suitability for the purpose of use with gas.

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As regards the pressure to which gas cylinders are filled, many are of opinion that a lower pressure than 120 atmospheres would be a wise alteration; but, if the engineers and steel experts say it is perfectly safe to use a properly constructed cylinder at this pressure, there is no doubt the convenience of the small-size cylinder at once turns the balance in favour of the present system, and so prevents a still further change.

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Owners of gas cylinders have certainly had a bothersome time of it—first, the change from iron to steel rendering those of the former (fortunately not a large number) valueless for the high-pressure gas; next, the decision of gas-compression companies only to put coal gas into cylinders with left-hand screw connexions, which meant new valves and new regulators, or portions of the regulator, and gauge connexions; and now, after waiting for the annealing of cylinders of a certain type, it is possible they, in turn, will become a loss, for, if they do not fulfil the requirements now laid down as to thickness, weight, tensile strength, &c., and bear certain test marks, they cannot any longer be filled with gas by these companies.

* * * * *

That the compressed gas system would receive a severe shock, if not become paralysed, had not the railway companies withdrawn their prohibition for conveyance by passenger train, is easily understood, for lantern operators could not always rely on the gas arriving at the particular hall in time by goods train, and what railway companies did other carriers and owners of vehicles, such as cabs, would follow suit in. Therefore, the first duty of those interested (as Mr. Murray pointed out), after the accident at Bradford, was to not only reassure the public, but satisfy the railway companies as to the safety of the cylinders when filled.

* * * * *

In carrying out this duty, they will no doubt receive blame from some quarters, as well as hard knocks, but, if they meet the owners of the condemned type of cylinders in a really liberal manner in exchanging the new type of cylinders for the old, the owners may become reconciled to the loss. It must, however, be borne in mind that the companies are, in the main, the people most commercially affected, and, in the end, will benefit financially more than any one else, for, without safe cylinders, it will be a matter of making gas at home, and having some modified form of gas-holder or gas bag when the limelight is to be employed.

* * * * *

Like the ordinary house gas companies, the gas compressors will find each year that electricity affects them more and more as regards the old demands; but, like them also, no doubt new uses will be found for the compressed gas, and there will be plenty of lanternists who, as soon as they are quite satisfied, will use the limelight instead of oil for all public exhibitions in suburban places, villages, &c.

* * * * *

Most of those who saw the electric light in the Camera Club lantern on the occasion of the test trial were satisfied as to its

steadiness, brilliancy, and adaptability when obtained in the way it is with Davenport's small hand-fed electric lamp, and suitable resistance interposed in the ordinary current; and, again, when the slides were shown to illustrate Mr. Burchett's paper, and the results of Captain Abney's photographic exposures (through coloured screens interposed in the photographic lens) at the time of taking the photograph, and this form of illumination cannot fail to become popular wherever the electric current of sixty volts and over is available.

* * * * *

I WAS disappointed that the demonstration on the advantage of triple condensers could not be completed the other evening at the Central Photographic Club owing to want of gas and time, for I should have liked to have seen the promised difference in showing an ordinary size view first with a double and then a triple condenser. This is a subject I take some interest in, and have done some little experimenting with, but have not fully exhausted the subject. From what I saw at the Lantern Society some year or so ago, and my own experience up to now, my conclusion is that a triple condenser is of advantage when a large diameter and comparatively short focus is required, for, if the focus is such that two lenses cannot be combined of the required diameter without producing an excess of spherical aberration, then three should be used to obtain the result.

* * * * *

THUS, for science lanterns, where the microscope and other optical attachments are to be used, a triple condenser is a distinct gain, and experiments in projection are facilitated if each lens of the condenser can be at once removed without unscrewing, for it often happens the mounts and lenses are hot, and then it is an awkward matter to remove them from inside the lantern, and without removal of one element, long-focus objectives cannot be used with the short-focus triple condenser most suitable for the microscope.

* * * * *

THE ingenuity displayed in making combination apparatus for optical work finds practical expression month after month, and recently a modification of the Delezenne-Sleeman polariser was obtained by using the lower mirror of the vertical attachment (in a reversed position), with the polarised glass bundle set to the proper angle beneath to project the rays through the object and analyser on the screen. It used to be said, "Science does not pay," but I think, with the technical and higher education of the people that science cannot help being a paying subject, and among the many instruments connected with light and optics more than a passing thought should be given to the polariscope.

G. R. BAKER.

THE PRESENT POSITION OF PHOTO-MICROGRAPHY.

[Photographic Congress.]

IF during the last year or two any notable advance, any startling discovery, or any new departure of great moment had taken place in the science of photo-micrography, the remarks which I am able to offer to you now would have been easier for me to make, and probably—certainly, I should say—more interesting for you to listen to. But I am not able to say that any such departure, or any such discovery has been made, and consequently I must content myself with, so far as I am able, stating the present position, according to my title, in which the science of photo-micrography stands, and endeavouring to interest you, as far as I may, by a description of the principles on which photo-micrographers work, and of such apparatus as we are now for the most part using.

On the general question as to the position of photo-micrography at present I have nothing to tell you except what is of an encouraging kind. Photo-micrography is being used more and more every day. Our scientific laboratories and institutions tell in general this tale. Installations for the purpose of photo-micrography are to my knowledge, and to the knowledge, no doubt, of many present, being constantly added to the scientific establishments of this country, and also, I am glad to be able to say, scientific instrument-makers have given their attention carefully to the production of suitable apparatus for the pursuit of the work; so much so that there are few, if any, opticians nowadays who do not keep apparatus, more or less perfectly adapted for the purpose, in stock, so that any one having a mind to take up this pursuit is able at once, at a moderate cost, to obtain apparatus sufficient for a beginning, and for a very satisfactory prosecution of the study of which we are talking. And I am also glad to say that the opticians in question, and scientific instrument-makers have sufficiently studied the *desiderata* of the question to be able, as I said, to supply satisfactory instruments, on the whole. I do not put it to you that they are all equally satisfactory, because in certain details undoubtedly a good deal is left wanting that might have been added; but still the attention of opticians in general is being directed to this matter, and the results are, on the whole, satisfactory.

OLD SYSTEMS.

Broadly speaking, looking at the photo-micrographic apparatus as a whole, I think it will be convenient to divide the systems that have obtained, and obtain now, into two headings. First of all, the systems where the microscope and the illuminating apparatus are on one base and the receiving surface on another. Now, the oldest systems with which I am acquainted were on that principle. The original apparatus of the well-known Dr. Woodward was on that principle, and so also was the apparatus of Dr. Maddox at one time. And this particular system is not altogether extinct even now. There is a well-known apparatus made by Zeiss in Germany, which still, to a certain extent, bears out these characteristics—the microscope and illuminating apparatus on one base, and the receiving surface on the other. You see how it is exemplified there absolutely. [Slide exhibited.] I need not point out to you that here we have on the face of it the danger of non-synchronous vibration of the parts. Strange as it may appear to some, one of the greatest difficulties that have to be met by the photo-micrographer, especially those who work with very high powers, is the danger of tremors—the extreme difficulty of absolutely eliminating that particular trouble of tremor in the parts. In my opinion, any system that is arranged on these lines—having the microscope, for instance, on one base and the camera on the other—is a step in the wrong direction. This, however, is a fairly good apparatus, and some excellent work has been produced by it. It does not follow, because excellent work has been done by any one system, that therefore that system is the most perfect which has been devised. Mr. Charters White, who is well known to many of us, has used also an apparatus for similar work on the same lines. In his microscope this receiving surface is isolated, so to speak. At the same time, there is no denying Mr. White's work is worthy of every commendation, but it is not high-power work as a rule.

THE MODERN SYSTEM.

Then we come to the other system—the rigid connexion of all the parts of our apparatus, and that is the system which is almost universally used, certainly in this country. The illuminating power, the microscope itself, and the camera are, in this system, firmly screwed to one base, and we shall presently see samples of that; in fact, the next slide is an example. [Slide exhibited.] The diagram now on the screen represents what was probably the most elaborate instrument that has ever been used or put together for this definite purpose of photo-micrography. You see it is an instrument very heavy in its make and extremely solid, and less likely, probably, than ordinary instruments to give way to tremors. I am informed that the addition of this trestle to the optical end of the microscope is not new. I thought it was the first occasion on which that introduction had been made, but I believe I was mistaken. I believe this was the first in this country. This microscope was made for the Royal Veterinary College by Messrs. Swift & Co., on designs partly of my own, and I think it is the most elaborate instrument that has been produced for the purpose of photo-micrography. It certainly answers its purpose extremely well. Not being able myself quite to meet the expense involved in such an instrument, I had another one made by Mr. Baker, which, to a certain extent, shows the same characteristics. This [slide], however, is an instrument of Mr. Swift's, and you will see in making that instrument Mr. Swift had in view the point which I am trying to urge upon you of the necessity for an absolutely stable and steady instrument for this particular work. This is a new design of microscope. As you may see for yourselves, it has every element of steadiness. I have not tried this instrument, and I only show it to you because it is new and because it appears to me to have many of the desired characteristics. The next one is the instrument about which I am talking [slide exhibited], the one produced by Mr. Baker for my own use on lines similar to those in Mr. Swift's. Here you see, again, we have got the ocular end supported at the end on a form of trestle, and that also is an instrument of complete steadiness; and, further, this is an instance where the whole apparatus for photo-micrography during the actual production of the photograph is screwed firmly to one solid and strong base. The instrument here on the right is a vertical instrument, and I call your attention to it because presently I shall allude to it later in a word or two.

Examining the Object.

You can understand well enough that, if you get a solid base and a microscope permanently fixed down to that base, when you have to make certain corrections and examinations down the tube of the microscope in the ordinary way preparatory to making a photograph, it must be extremely inconvenient to put your head in between the ocular of the microscope and the front of the camera. Consequently, if we have a capability of drawing out from the centre line this table on which the microscope itself stands, so that we get the eye to the ocular end of the microscope to examine the pictures, we feel that there is a step gained, provided always that we do not introduce the element of instability, and in instruments most commonly made now there is this capability. Here is an instance of it. [Slide exhibited.] Here is a strong screw, which we loosen, and enables this table, bearing the microscope and the illuminating apparatus, to be turned out, so that the operator can sit down in the ordinary manner and position, and examine the object down the tube in the ordinary way. After the examination is made and the corrections put right, the microscope and with it the light is turned back to its central position, and the front of the camera is brought up to that; that is a modification of the solid-base system which, in my opinion, is most desirable. It is quite true that some very good workers do not use this turn-table. For instance, Mr. Nelson does not use it. Dr. Bousfield also does not use it. At the same time, I have worked with the instruments of these gentlemen, and, although these gentlemen personally find them convenient and efficient, I found the position was uncomfortable, and it appeared to my mind that my eye was not quite accurate in that position. With this instrument I can seat myself where I can comfortably use a chair and in the ordinary way look down the tube of the microscope. The great point in all cases of dealing with high powers is that you shall have a complete apparatus which shall not be shaken during the exposure, and which, at all events, shall not be shaken, except synchronously, because (as is well known) an apparatus may be shaken, and if it is shaken synchronously, all the parts together, probably no damage will result from such a tremor.

Vertical Apparatus.

There is another point when we are looking at an apparatus of this sort, and it is this one: The apparatus is entirely on the horizontal, and the apparatus on the right is entirely on the vertical. The vertical position, of course, will commend itself to you at once as having certain advantages, and as being, in certain cases, absolutely necessary if you are dealing with an object which is itself a liquid, or objects which are themselves contained in a liquid, so that you cannot cover them. It stands to reason that, if the microscope system is turned on the horizontal, the whole affair would be impracticable, and consequently, in certain cases, the vertical instrument is necessary. The instrument you see on the right was a modification of a well-known model of Zeiss's. It has only been moderately successful, and it has been relinquished for another one, which you will see and investigate presently. Dr. Van Heurck, of Antwerp, who has done, as most microscopists know, some extremely important and good work, uses this vertical instrument. [Slide shown.] This is almost the acme of simplicity, as you can see for yourselves. It is simply a microscope with a box over it, and you can judge from the work he has given to the world that it is effective. [Demonstration of slide.] But, for certain reasons, I was induced to try and make something a little bit more elaborate than that, and the result will be shown presently. The slide that is coming first, however, introduces another question, which ought to be, and I hope will be, interesting. There are a great many objects nowadays which it would be extremely interesting and valuable to get photographed in the living and in the moving state, and I believe that it is a long time since attempts were made to produce what I may call instantaneous photo-micrographs. Among other devices for this purpose was one—and it is one by Nachet, the well-known optician—an apparatus which has elements of great interest about it, and this diagram will enable you to understand the general principles on which it is made. [Slide shown and explained.] When the prism is in one position, the image, instead of being projected up the tube towards the sensitive plate, is projected along an auxiliary tube. The result of that is that the observer can watch the image of the object along this tube here—the side tube. No rays in the mean time reach the sensitive plate. When the focus and the position of the object are satisfactory, the spring here is touched; it acts in a manner I need not detail here, the prism flies aside, and the exposure is instantly made and immediately finished.

There is a certain difficulty with regard to instruments of this kind which I shall not stop to describe here, as it is very intricate. It amounts to this, that with each instrument of that kind a certain adaptation has to be made by the operator, so that the image seen through the side tube shall be in focus simultaneously with the image projected on the sensitive surface. I made some experiments myself during the past year with a view of seeing whether I could not substitute for the prism a speculum. I got a certain amount of success, but not sufficient on the whole to warrant wasting any of your time with it now. I attempted to introduce another system of instantaneous exposure, which will be easily understood. [Slide exhibited.] The complete camera is seen on the screen. It is a very steady camera, to begin with, and it requires to be so, as you will realise presently. [Demonstration.] When the focus and position are correct, this slide shutter is actuated in any way that may suggest itself as being most convenient. This is merely an experimental shutter, and, provided you see the principle on which it is intended to act, it will fulfil all the requirements that are necessary. The method of actuating this shutter has puzzled me to a certain extent, but I put on the end here a weight, which may be graduated to suit the requised exposure. By means of this I get a short exposure, and no jar of any kind; but, as you can easily understand, the increasing rapidity gives an unevenly illuminated picture. But what remains to be done is to actuate this in a different way, so that there would be an even exposure given all the way along without jar. There is not much fear of jar with this instrument, because it is so steady and so strongly made.

I said just now that there had not been any considerable advance in the science for some time. Two advances there are, but not very modern. The two advances to which I refer are, as you will at once guess, first, the introduction of orthochromatic plates; and, secondly, the improvement that was made, chiefly by Abbe, in the making of apochromatic glasses.

Andrew Pringle.

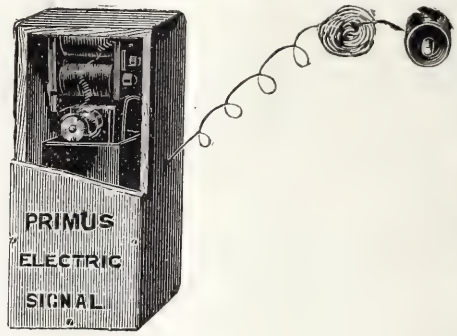
(To be continued.)

RECENT NOVELTIES IN LANTERN APPARATUS.

"Primus" Lantern Lecturer's Electrical Signal.

W. Butcher & Son, Blackheath.

Messrs. Butcher & Son are introducing an electric battery for use as a lecturer's signal. It consists of a battery with single-stroke electric signal, enclosed in a portable case, with fifty-four feet of flexible wire and a push. A code is provided so that signals for various requirements may be understood by the lanternist. In use: Stand the box down close to the lantern, and convey the wire across the room over the heads of the audience. A knob, post, or gas bracket can generally be found to which the wire can be temporarily fixed. The lecturer can either hold the push in his hand, or place it in any suitable position. Such a contrivance should be very useful to the lanternist, especially in these days, when smoothness and good order are essential to the pleasure of lantern audiences, who are rapidly becoming exceedingly critical.



"Primus" Spot Binding Strips.

These strips are ungummed, and have spaces for title and number to come both on the front and top of slide. This latter should be found a great improvement in lantern-slide binding strips; when placed in the ordinary storing boxes, the titles being written on the top, any required slide can be easily selected.



"Primus" Combination Cylinder Key.

The illustration shows a new form of key combining wing-nut lever, gland spanner, and valve key. The wing nut as supplied on ordinary nipples

and unions, &c., is intended to be fixed on to the gas cylinder with the hand, but in actual practice it is very often that a gas-tight joint cannot be obtained without hammering the wing nut. This sudden jar is very

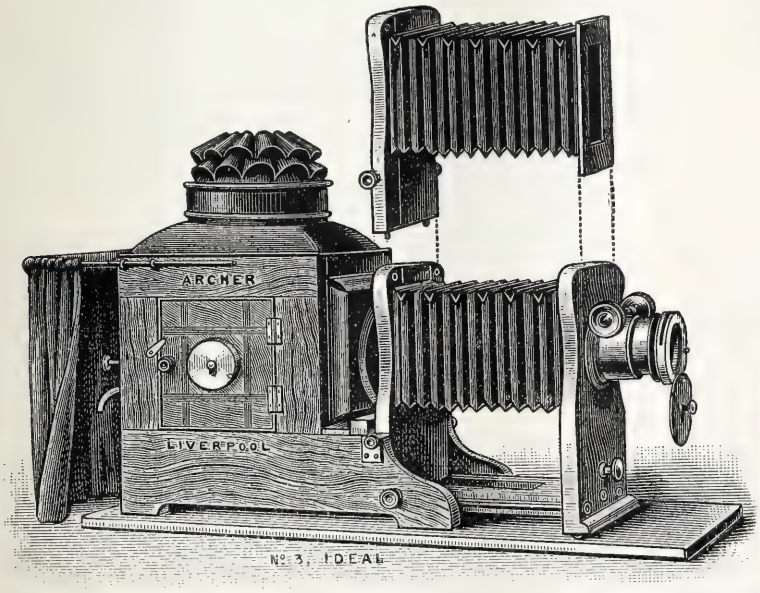


likely to damage the delicate parts of a regulator or gauge, which will be obviated by the use of this wing-nut lever. The gland spanner will, on occasion, serve to stop a leaking gland. The valve key is the usual key for opening and closing the valve, and will fit most cylinders.

The New "Ideal" Lantern.

Archer & Sons, Lord-street, Liverpool.

Messrs. Archer & Sons have brought out a new patent Ideal lantern in a cheaper form, which they call the No. 3. It has all the good working points of the others, only it is plainer in make. It is complete, with



condensers, interchangeable objectives and bellows front, extending to fourteen inches. The front slides out easily, and can be locked instantly at any distance. It is fitted also with rollers, which can rest on the box or table for absolute rigidity. The bellows can be quickly removed when required for experiments, and a table placed in front of the condensers.

The new "Williams" system of flash lighting a sitter for photographic purposes, says a contemporary, was recently submitted to a practical trial at a meeting of the Chicago Camera Club. This system consists of a frame supporting thirty-six small gas jets in four rows of nine each. There is immediately behind each burner a small cup, into which are placed a few grains of magnesium powder, and the cups are attached to rods connected together, so that, by the turning of a crank, they are simultaneously emptied over the flames from the jets, giving, it is stated, a brilliant mass of light spread over a comparatively large surface. In the course of the meeting the members of the Club adjourned to a studio, and a negative of a lady was taken by this agency, and, it is reported, a slide made from it was projected on the screen a little later in the evening, which is an excellent testimony to the success of the new system.

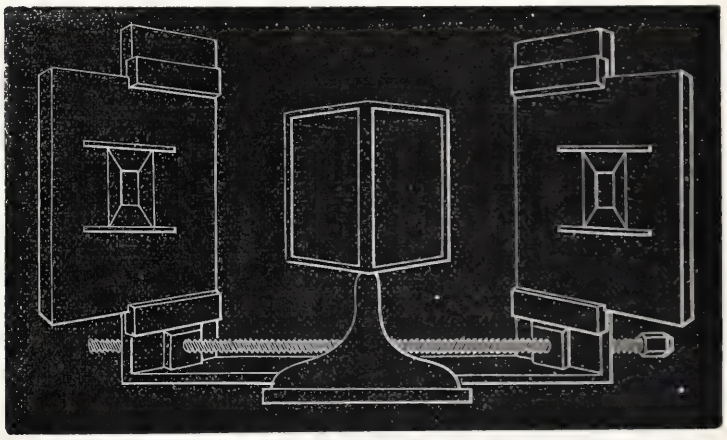
THE STEREOSCOPE: PAST AND PRESENT.

[Hackney Photographic Society.]

Inasmuch as I believe that the *renaissance* of stereoscopic photography, which is just now manifesting itself, will shortly be followed by a revived interest in the stereoscope itself, and that this, in its turn, may lead to the rediscovery and reinvention of many useful modifications of which that vicissitudinous instrument is susceptible, I have thought that possibly a descriptive reference to some of the various forms which the stereoscope has from time to time assumed would be acceptable as the subject of this paper. To some extent, the stereoscope, in the examination of binocular photographs, assists the eyes in the execution of the office they themselves perform when regarding a natural scene or group; that is, in the presentation through the optic nerves to the brain of two dissimilar views. You may remind me that, by the simple convergence of the optic axis, the eyes alone, unaided by the stereoscope, enable one to see binocular photographs in relief; but, independently of the fact that this power over the eyes is probably not common, there are optical and other reasons which render the employment of the stereoscope a necessity. Of these I will only cite one. The stereograph, it is generally held, should be inspected under the same angular conditions as those by which the negative was taken, and, as normal vision will not admit of an object being properly viewed at a nearer distance than eight inches, it follows that means must be taken to effect the necessary focal adjustment of the images that are to be transmitted to the retinæ. This is a function of the stereoscope, and it is practically denied to the eyes. Hence you will perceive, if your binocular negatives were taken with a pair of five-inch lenses, a stereoscope, having lenses of that focus, permits you to examine the pictures at the angle the view lenses included. And from this it will be obvious, although the point, I fancy, escapes general notice, that the lenses employed for taking the negatives can be used as the eyepieces of the stereoscope.

The Reflecting Stereoscope.

Stereoscopes, ancient and modern, are divisible into two classes, reflecting and refracting. Typical of the former is, of course, that of Wheatstone, which consisted, in brief, of two mirrors inclined at an angle of 45° with the eyes. These reflected the pictures placed in frames horizontally to the mirrors, and admitting of the necessary adjustments, so that, when the observer placed his right and left eyes near to the right and left mirrors, he saw but one image, and that in apparent relief. Many variations and improvements upon this form of stereoscope were

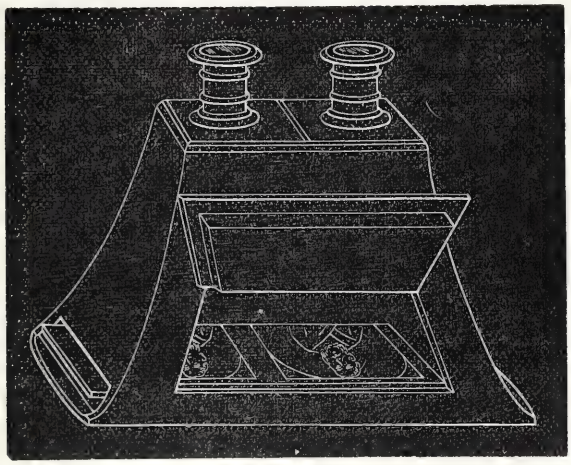


made up to about the year 1874, its adaptability for binocular photographs of large dimensions being, perhaps, its principal feature; but I do not think, so far as photography is concerned, that the reflecting stereoscope ever got much beyond the experimental stage, as it was large and cumbersome, and was, besides, possibly not the best form, either in a mechanical or optical sense. It was outlived by the lenticular stereoscope of Brewster, which virtually forms the basis of all the varieties of the instrument that succeeded it.

Perhaps it may interest modern photographers to be reminded that the invention of the stereoscope, both in its reflecting and its refracting forms, slightly antedated the introduction of the Daguerreotype. As a philosophical means of enabling one to observe images of plane bodies stereoscopically, it had a certain *succès d'estime* for about fourteen or fifteen years, but it was not until the introduction of the collodion process that it became in any sense popular in photography.

The Refracting Stereoscope.

The refracting or lenticular stereoscope was introduced by Sir David Brewster, and it consisted of a pyramidal box, with a lid to admit the light to the paper stereograph. On the top of the box were eye tubes, in which semi-lenses were mounted. In his work on the subject, Brewster lays down the necessity of having the power of horizontally moving the eyepieces to suit the separation of the eyes of individuals, and also indicates that the lens tubes should be movable so as to accommodate the focal lengths of different persons' eyes. Although many years ago the box form of stereoscope was commercially constructed in accordance with these obvious requirements of the case, one seldom meets with it nowadays. I have, however, often handled box stereoscopes fitted with



the usual lenticular prisms as the eyepieces, but without the power of adjustment either as regards separation or focus. To our modern ideas the box form, by excluding a large proportion of the light from the picture, is practically the worst type of stereoscope you could have, and. when to such a drawback you add those I have just mentioned, you can very easily nnderstand why disfavour and obloquy should have early overtaken it. Instead of semi-lenses, lenticular prisms, which, though usually square, amount to virtually the same thing, were used (and, as a matter of fact, are generally used now), the thin edges being placed together. According to theory, it is the refraction at the edges of the semi-lenses or prisms which causes the optic axes to converge to a point between the binocular pictures undergoing examination where a third picture is seen in relief. I confess to feeling some little difficulty in entirely accepting this theory, for, if it is true in ordinary or binocular vision, there should be a point where a third picture is formed, whereas we know that no such thing takes place. However, my business on this occasion is not with the theory, but with the construction of the stereoscope.

Various Forms of the Stereoscope.

Brewster's invention gave a fillip to other minds, the immediate consequence being many attempts to simplify the stereoscope. He himself alludes in his work to Duboscq's spectacle stereoscope, which simply consisted of two lenses mounted at the usual distance in comparatively light frames, and held by a handle just as you may see a fashionable lady of the day hold her lorgnette. Duboscq also had another form, in which the lenses were fixed in small tubes with means for separating them. The binocular picture was placed at the end of a holder, no box or cover being used, and this enabled pictures of larger than the usual size vertically being examined. Before I have concluded this paper you will see that at an interval of about forty-five years Duboscq's very excellent ideas, notwithstanding that Brewster discounted their utility, have earned the invaluable recognition of reinvention.

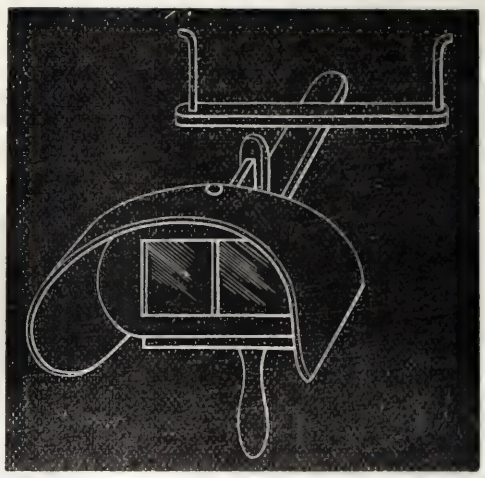
A folding stereoscope, which consisted of an improvement on Duboscq's spectacle stereoscope, by hinging the centre so that it doubled up, was shortly afterwards brought out, and this form is still extant. The late Mr. Thomas Sutton, in 1860, suggested a combination of the reflecting and refracting principles in a stereoscope, which, like a great many others of Mr. Sutton's suggestions, never took practical shape. This one was supposed to allow of pictures larger than the ordinary dimensions being examined. The eyepieces were of the usual kind, but where the photograph was commonly placed, two mirrors, inclined at an angle, were fixed, which reflected the two photographs, one of which was placed at an angle at each side of the eyepiece end of the stereoscope.

Still another device for obtaining apparent increase of dimensions in stereoscopic pictures emanated from the eminent philosopher, Professor Clerk Maxwell. In the axis of an ordinary lenticular stereoscope, and several inches from the eyepieces, a large lens was erected, which, being looked through from a little distance, was said to make the binocular view beyond seem like the real object. Hermagis, of Paris, was also credited with a modification that admitted of stereoscopic portraits being viewed of life-size dimensions.

If time and your patience allowed this paper to be exhaustive, I could enumerate many more variations of the stereoscope which would prove that, in former years, men of the highest scientific eminence did not disdain to turn their attention to its improvement and modification.

The American Stereoscope.

The neat and handy form of what is known as the American stereoscope is so familiar to you that it does not require any description. It is, I believe, the device of Oliver Wendell Holmes, and it was introduced to this country in the year 1868, when it instantly leapt into great favour. I have called it neat and handy; it is also portable, and occasionally effective. Perhaps the only respects in which it is invariably effective is in shielding the eyes from extraneous light, and by its open form permitting the access of plenty of illumination to the photograph. It is a thousand pities that this form of stereoscope should be made the victim of those twin curses, cheapness and nastiness. Large numbers of such stereoscopes are at the present moment being produced for about a

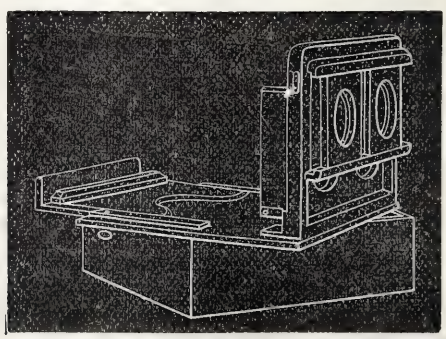


shilling each, and sold at a small profit. Needless to say that they have only a limited range of efficiency.

The form is so good that it would be worth the while of our apparatus-makers to turn their attention to its improvement. What is required is that it should be adapted to take either transparencies or paper slides; that the lenses should be capable of separation, preferably by means of a right and left-hand thread screw; that they should be capable of vertical movement; that separate lens fronts, carrying lenses of different foci, should be available; that the wooden division, which is unnecessary, should be abolished; and, above all, that achromatic lenses only should be used. The more important of these *desiderata* are embodied in a stereoscope sold by Chadwick, of Manchester, but no other maker, so far as I am aware, pays the slightest attention to them. In the meanwhile, the dissemination of the stupidly ineffective and gingerbread affairs that are rapidly reaching the crowning glory of the toy-shop window will assuredly bring stereoscopic photography into disrepute among the public once more, and I hope, therefore, that some of our makers will take the hint, and give the instrument a fair chance, at least among amateur photographers.

Harding Warner's Stereoscope.

This stereoscope, which was introduced in 1871, is made by Mr

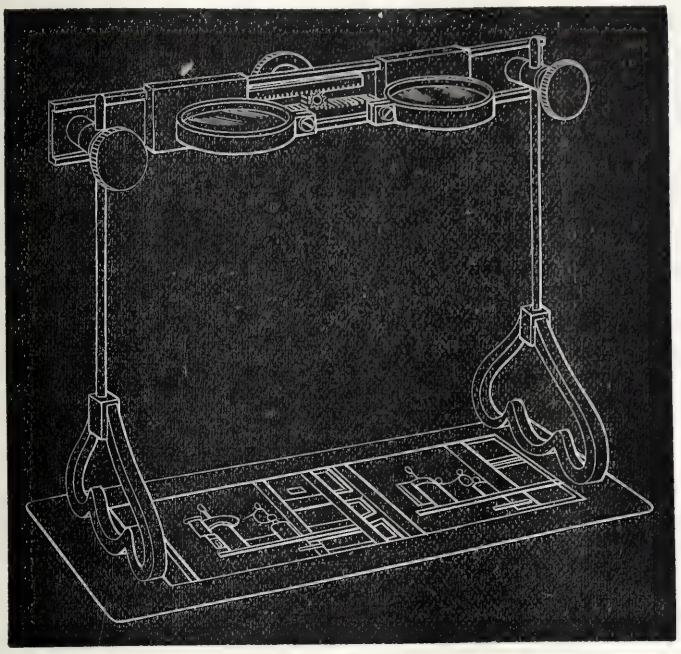


Husbands, of Bristol, and has many points of excellence. You will observe that the lenses (which are achromatic) are easily adjustable in both

ways, thus allowing for various degrees of separation of the eyes, as well as for the examination of pictures of abnormal height. Focussing is done from the back, and the pictures are held in an adjustable slot on the baseboard. Possibly the stereoscope would be improved by an eyeshade; but, as it is, it is an elegant and effective instrument, and for table use, may in some respects be considered superior to the American.

A Book Stereoscope.

If collotype reproductions of good stereoscopic negatives were published



in book form, and a suitable stereoscope provided for their inspection, I am convinced that any one undertaking such would find it profitable. The stereoscope, of which I here show you an illustration, and which amplifies Duboscq's old idea, would, no doubt, answer the purpose admirably. You see that the eyepiece end is supported on two thin uprights, and that three screws allow of the adjustment of the lenses and of the focus, thus fulfilling all the primary conditions of practicability.

As it was my intention in this paper only to suggest a few simple, practicable, and cheap ideas to those who might feel disposed to construct stereoscopes for themselves, it would be going outside its scope to treat of the revolving stereoscope, and that which I shall term the multiple stereoscope, namely, an instrument to enable, say, half a dozen persons to examine a revolving set of transparencies, as well as other modifications.

But I would conclude with a plea for the use of achromatic lenses as eyepieces. They not only improve the definition of the images, but obviate the colour fringes inseparable from the uncorrected prisms when looked through the outer edges. Again, I would say that, while there is a limit to the dimensions of the stereoscopic slide or transparency in a horizontal direction, vertically we are in the habit of making them too small. Thus, by having a vertical movement of the eyepiece, we are able, without any difficulty, to appreciate pictures of four to five inches in height, a thing that is troublesome in the American form of stereoscope. Furthermore, if it be borne in mind that, by employing in our cameras lenses up to seven and eight inches in focus, an increase in the focus of the eyepieces of the stereoscope will allow of considerable apparent magnification of the image, another element of diversity is introduced. Then, you may not only use the lenses with which you took the stereoscopic negatives as eyepieces for the stereoscope, but, with a little ingenuity, the camera itself may, on an emergency, be converted into a stereoscope in which transparencies especially could be viewed with complete success.

Lastly, may I hope that the foregoing fragmentary outline of the stereoscope, and its practical possibilities, will convince even the few foolish and shallow persons who affect to regard it as a scientific toy that the principles involved in its correct construction are as interesting and instructive as the results it produces for us are beautiful?

Thomas Bedding.

STRENGTH OF GAS CYLINDERS.

From particulars published by Mr. Murray, I have compiled the following:—

Size of Cylinder.				Bursting Pressure.		Limit of Elasticity.		Pressure full.		Test Pressure, 1½ Tons.		Test Pressure, 2 Tons.		
External Diameter.	Thickness.	Internal Diameter.	Construction of Cylinder.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per square inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per square inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Factor of Safety.
4″	$\frac{5}{32}$″	$3\frac{1}{16}$″	Solid drawn	5593	66,000	3813	45,000	1800	21,240	3360	39,648	4480	52,864	3·1
4″	$\frac{3}{16}$″	$3\frac{5}{8}$	Lap-weld	5586	54,000	3621	35,000	1800	17,400	3360	32,480	4480	43,307	3·1
$5\frac{1}{2}$″	$\frac{7}{32}$″	$5\frac{1}{16}$″	Solid drawn	5704	66,000	3888	45,000	1800	20,829	3360	38,880	4480	51,840	2·9
$5\frac{1}{2}$″	$\frac{1}{4}$″	5″	Lap-weld	5400	54,000	3500	35,000	1800	18,000	3360	33,600	4480	44,800	3·0
7″	$\frac{9}{32}$″	$6\frac{7}{16}$″	Solid drawn	5767	66,000	3932	45,000	1800	20,600	3360	38,453	4480	51,271	3·2
7″	Not	made.	Lap-weld											

From this table it will be seen that the "factor of safety"—that is, the number of times that the ultimate tensile strength of the metal exceeds the strain to which it is subjected when the bottle is full—is not higher than 3·2, and in one case is as low as 2·9.

In the design of permanent engineering works a factor of safety of 4 or 5 is usually taken, a good average being 4·5.

It will, therefore, be evident that gas cylinders should be made 50% thicker than at present, to give them the proportion of ultimate strength to working strength adopted in other engineering works.

In Mr. Murray's article he assumes the test pressure to be one and a half ton to the square inch. Most of the bottles that have passed through my hands have been stamped "two tons test." On reference to the table it will be found that, if bottles of the thickness there given were subjected to the two-ton test, the limit of elasticity would be passed, and the bottle be permanently strained and weakened. In fact, one gentleman told me that, since the Bradford accident, his cylinder had been tested. The report was that it had slightly bulged. It had, however, been filled, and he was still using it!

If we take the thickness of $\frac{1}{15}$, recommended by Professor Goodman for solid-drawn cylinders, and use steel of an ultimate tensile strength of thirty tons per square inch, the table will be as follows for all sizes :—

Size of Cylinder.			Construction of Cylinder.	Bursting Pressure.		Limit of Elasticity.		Pressure full.		Test Pressure, 1½ Ton.		Test Pressure, 2 Tons.		Factor of Safety.
External Diameter.	Thickness.	Internal Diameter.		Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	Pressure in pounds per square inch on Bottle.	Tensile Strain in pounds per sq. inch on Metal.	
$1\frac{2}{15}x$	$\frac{1}{15}x$	x	Solid drawn	8960	67,200	6000	45,000	1800	13,500	3360	25,200	4480	33,600	5

The factor of safety will then be in accord with engineering practice in other structures, and even at a test pressure of two tons per square inch the limit of elasticity will not be approached sufficiently near for damage to be done to the cylinder in testing.

It is to be hoped that Professor Goodman's suggestions will be at once adopted by the Oxygen Companies, who should also decline to fill existing cylinders to a pressure exceeding 1200 pounds to the square inch, or eighty atmospheres, and decline to test them to more than one and a half ton to the square inch.

D. Edmondson Benson.

Southport.

BINDING LANTERN SLIDES.

"I must now draw attention to the matter of slide mounting, or, more correctly, binding," says "Technique" in *Photographic Scraps*. "As practised at present, the method adopted is to bind with strips of black or other dark-coloured paper. Probably this serves the purpose where slides are seldom handled, but we must all of us have seen many slides with the bindings worn away, or torn off, or separated from the glass by reason of non-adhesion, or all these things combined; the ragged condition of such slides is not only detrimental to their appearance, but is also injurious to their welfare, for dust gets in between the glass, and frequently moisture finds its way there also, and when the slides are placed in the heat in the lantern steam forms where the moisture was. Finally, when the paper binding gives way, the covering glass often becomes detached, For some time I have been experimenting upon different styles of binding, and I have settled down to the use of tape. If you go to the smallware shops, and ask for narrow black tape, they will show you a drawer of various widths. I select one of three-eighths of an inch wide, of a thin, hard glazed quality. These tapes are sold in pieces of a dozen yards for one penny. You can cut four bits to go round the four sides of a slide, or you can make one piece do the job. If you are dexterous and neat in your work, the latter will prove the most satisfactory. Whichever you adopt, you must use starch paste as your sticking substance. Glue or gum are useless; shoemaker's paste will do, as it will stick to glass, but starch is the best, I think. The starch must be very thick, and you will need a small sash tool with stiff bristles to spread it with. Lay the length or lengths of tape on a piece of brown paper, and spread the thick starch on the dull side of the tape; let it lie a minute, and then give it another daub. When quite limp, and with a good coat of starch, place the slide on edge on the tape, and begin to bind round. If you cut four pieces, they should be fully one-eighth of an inch too long, as they shrink when wet with starch. If you use only one piece, starch it an inch too long, wind it round edges, and then snip off with scissors, and finish the join. In a warm room, starch will set pretty quickly. You can keep half a dozen slides going by squeezing the tape to the edges of the glass until safely set. When set and quite dry, you can clean off both sides of the glass in a way you dare not venture to attempt near a paper binding. Starch, when dry, is pretty insoluble, and the edge of the tape shows no disposition to fray or rub up, as paper would do. One great advantage of a tape binding is, the greater safety of the slides when packed and squeezed against each other. The dull sound a slide makes if dropped, when it has been tape-bound, in comparison with one bound with paper, will convince any one that tape is far superior to paper, or to any metal binding. I have alluded to black tape; I don't know that there is any particular merit in its being black, beyond its durability, but any other colour or tint may be used so long as the tape is thin and hard, and glazed on one side, and absorbent of starch on the other.

"Tape-bound slides can be coated with thin shellac varnish to exclude the air, and this process is alike suitable for the binding of transparencies or for *passe-partouts*, or the opalines which are to be framed, such as I alluded to in my previous article."

Lantern Queries.

J. Rowlands.—You mean Barton's anti-glare jet, in which all the movements are from the exterior of the lantern, so that no light strikes into the room. See The Lantern Record for October last.

W. T. Wood.—Apply to any one of the lantern dealers. As a rule, such a set as you require may be hired for a few shillings a night.

In Doubt.—You are wrong. Nobody, so far as we are aware, discourages the use of gauges, provided they are free of dangerous organic compounds, such as oil, grease, &c. We do not think balances are much, if at all, used.

Bottle.—To our knowledge several lanternists, during the recent scare, carried their gas cylinders in innocent-looking boxes and other disguises.

A. H. Newman (Melksham).—Answered by post.

A. Reeves.—We frequently have questions similar to yours. By making lantern slides (without permission) of pictures in which there is a copyright, you run the risk of an action for infringement.

Colour.—No; the Lumière pictures, at the Society of Arts, were not shown by straight-through projection, but by reflection. The pictures were bound up, backed, and mounted under prisms.

That collector of lantern views, say *The Exhibitor*, who is so far for his own gratification, is the most exacting in reference to quality; when he is going to buy, he demands that the the pictures be from the original negatives, not copies, that they shall be sharp from centre to edge, that the views shall be taken from an artistic standpoint, and other requirements that are only obtainable through long experience and by an adept worker, all of which is right on his part; at the same time, being a great traveller, he has obtained many negatives, which he wishes to sell, and in his endeavours he develops this peculiar disease to which we refer. Naturaliy his pictures have not had any of the safeguards mentioned, that lead to perfection, and they are of such a grade that if he saw them in a dealer's stock he would be amazed nevertheless, being his own, he does not know it.

"Projected Portraits." "The Search Light. By Radiant" and other communications are unavoidably held over.

*** *Several correspondents who write asking if back numbers of* The Lantern Record *can be obtained are informed that the Publishers are prepared to supply them.* The Lantern Record *is issued on the first Friday of each month as a supplement to* The British Journal of Photography.

MONTHLY SUPPLEMENT

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THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

Messrs. W. Butcher & Son, of Blackheath, have sent us samples of their new "Primus" naturalistic tinted cover glasses for lantern slides. The effects aimed at are sunlight, with or without clouds; sunset, with or without clouds; and water effects. The sunlight effects are produced by having a blue sky at the top, gradually softening off to a clear, or slightly yellow for the horizon, and then becoming stronger in a reddish yellow for the foreground; sunset effects by having a blue sky at the top, with a sun reflection just above the horizon, and a corresponding reflection in the foreground; water effects by having a blue sky at the top, gradually softening to the horizon, and having a greenish blue foreground. The cover glasses are supplied in sets. We have used the tinted cover glasses for binding up slides of both land and seascapes, and can testify that the effects produced are extremely charming. This is a happy idea of Messrs. Butcher, which should have great popularity among lantern-slide makers, who will find that the soft colour tints diffused, as it were, through the positive image by the coloured cover glass, gives it a chromatic effect of great delicacy and naturalness.

* * * * *

The following sets of lantern slides, by Mr. J. Pattison Gibson, of Hexham, have been published:—1. *Castles and Pele Towers of the English Border* (pictorial series), 30 slides; 2. *Castles and Pele Towers of the English Border* (archæological series), 30 slides; 3. *The Roman Wall*, 30 slides; 4. *The Roman Occupation of the North of England*, 30 slides; 5. *Northumbrian River Scenery*, 30 slides; 6. *Views on the Tyne*, from pictures taken by J. W. Carmichael about sixty years ago, forming excellent illustrations of the state of the industries of the Tyne at that time, 25 slides; 7. *Fountains Abbey*, 25 slides. The following sets are from photographs by Mr. E. G. Lee:—8. *Child Life in the Slums*, 30 slides; 9. *The Herring Fishery Industry*, 30 slides; 10. *Street Life*, 30 slides; 11. *Instantaneous and Marine Studies*, 30 slides.

* * * * *

Tinted cover glasses for stereoscopic transparencies would, no doubt, find appreciation at the hands of many who are just now taking up twin-lens work. We have examined a transparency backed up with a couple of Messrs. Butcher's tinted lantern cover glasses, and the effect is decidedly pleasing.

* * * * *

According to a contemporary, oxygen gas is coming into use in glass-making. When it is passed into the melted material everything is oxidised as far as possible, the colour is clearer, and the composition is much more uniform, partly through the heat being evolved in the midst of the mass, as well as communicated to it from without. The amount of oxygen used is from fifty to seventy cubic feet per ton of glass, and the process is said to effect a considerable saving of time.

* * * * *

Anthony's Bulletin has the following note on skies in lantern slides:—"Much has recently been said and written on the propriety of aiming for absolutely clear skies and of using slow plates. Mr. H. J. Newton has shown very fine slides made on the quickest plates obtainable, and artists who have seen them have lauded them for their artistic merit. It would seem that there is no more reason for a vast white expanse of sky above the landscape in a lantern slide than there is for its presence in a print. We endeavour to insert suitable clouds and sky effects in the latter; why not in the former? and, if such cloud negatives are not obtainable, surely a flat, grey tint would, in many instances, serve as an admirable substitute." The latter suggestion is an excellent one.

* * * * *

On Friday last, February 23, there was held at the London Chamber of Commerce a meeting in reference to gas cylinders and the pressure at which they are filled. In his "Lantern Mems," on another page, Mr. G. R. Baker has some particulars of what transpired which we commend to the attention of our readers.

VIGNETTING AND DOUBLE-PRINTING TRANSPARENCIES AND BROMIDES.

Although the processes of vignetting and masking prints have been so frequently described—and the work, if performed with ordinary care, is theoretically very easy—it is remarkable how very few amateurs are met with who possess more than a mere hazy idea how to proceed at all, still less to execute first-class work. If this be true with any of the printing-out methods, it is still more noticeable when development processes are in question, and it is very seldom that the attempt is made except by veritable "old hands." Yet, with very little trouble, as good results may be obtained, and with equal certainty, by development as by the printing-out processes, in which the effect is visible throughout.

Vignetting is but seldom resorted to in the production of lantern slides, although I may remark in passing that very pleasing results are often obtainable with certain subjects, or with negatives that do not give a perfectly satisfactory result when printed to the edges, but for transparencies of larger size for decorative purposes, both landscape and portrait, some of the most charming effects are obtained by judicious vignetting. But even with lantern slides it is often necessary, or at least desirable, to mask portions of the negative for the purpose of printing in clouds; yet the operation is one that few amateurs care to "tackle," although, when taken in hand systematically, it presents little more difficulty than upon albumen paper or any other printing-out process.

Vignetting is undoubtedly much the easier task of the two, whether the printing is by contact or in the camera. In the first instance, the only difference, perhaps, that will be found between printing out and development is that in the latter case the work is

most frequently performed by artificial light, which renders it more difficult to secure soft gradation than with diffused daylight. With very slow plates, or films that will bear exposure to diffused daylight, the process may, of course, be identical with that followed under the ordinary circumstances of printing out, that is to say, any of the ordinary vignetting devices may be used, the only difference being one of exposure.

But with the quicker plates and papers, that require only a short exposure to gas or lamp light, it is scarcely safe to trust to any of the ordinary systems of masking, owing to the sharp shadows cast by the mask when exposed at a limited distance from the source of light. The interposition of translucent media, such as tissue paper or ground glass, does not materially help matters, since, though it may prevent the production of a perfectly sharp line round the outline of the mask, it fails to give anything like the same gradual softening away that would be produced in diffused light.

The trouble is, however, easily surmounted by methods similar to those adopted in printing out in order to obtain the very best results; only, in this case, the expedients are absolutely necessary, instead of being adopted merely as extra refinements. The needful arrangements, too, are simpler for the brief exposures required by bromide films than in printing out, and consist in keeping the printing frame in constant and regular motion during the time of exposure. This may be done in a variety of ways, the simplest—that is, the one requiring least preparation—consisting in applying the motion by hand. To carry out this method, the light should be placed at a distance of some feet from the operator, who, holding the printing frame in a perpendicular position, moves it in a circular direction, with a sort of waving motion in front of the light. This plan, however, is liable to the objection that any inequality in the motion, especially when the exposure is very short, is liable to produce corresponding unevenness in the gradations of the vignette.

A better plan, and one involving but little more trouble, is to swing a board of suitable dimensions in a perfectly horizontal position by means of four strings, fixed to the corners; the longer the strings the better. If this be twisted round several revolutions, it will, when released, untwist by its own weight in a reverse direction, and form a horizontal revolving table, upon which the printing frame can be laid during exposure. For the few seconds required with modern rapid films no special precautions need be adopted in the preparation of this revolving table; but, if it be required for use with the slower processes, the four supporting ropes should be as long as conveniently may be, in order to ensure a pretty long revolution without attention, and, to further assist this end, each should be composed of a series of strands of worsted, wool, or other soft material.

With such an arrangement, the light may be placed in such a position as to fall on the table at an angle of about 45°, more or less, according to the distance between the mask and the negative, bearing in mind that, the smaller the angle at which the rays meet the surface, the farther will they spread underneath the mask, and also the less light will penetrate the negative. The best distance will easily be found, and, once secured, all else that is necessary is to set the table revolving smoothly, and then to drop the printing frame into position for the requisite time. The aperture in the mask is, perhaps, better covered with a sheet of oiled tissue paper or ground glass; but, if the distance of the light and of the mask from the negative be properly gauged, there will be no absolute necessity, and the exposure will then be less.

For masking the sky and landscape portions of a negative for printing in clouds, the same arrangement will answer equally; indeed, for all purposes of this kind, it is the best that can be adopted. But where the sky line is tolerably straight, that is to say, where it is not much broken up by trees or buildings, I can recommend another method, that will prove simpler to many. This consists in using, instead of the revolving table, one of the "rockers" now so much used for keeping the developing dish in motion. If this has simply a backward and forward motion, the printing frame will, of course, be placed with the sky line at right angles to the swing of the pendulum; but a better form of "rocker," and one which will do almost as well as the revolving table for all purposes, is one working with a circular motion on a sort of ball-and-socket centre. I have seen one such in use, but do not know who is the maker, but a pretty fair substitute can be rigged up by passing a stout iron wire, three or four feet long, through a roughly turned wooden or brass sphere, and using an ordinary tripod stand as a support.

In double masking for the printing in of clouds, it is needless to say that success depends mainly upon the proper adjustment of the respective masks, and this, of course, cannot be done without actual trial; in other words, it is scarcely possible to tell what will be the result until after development. Under such circumstances, in order to economise material, it is therefore advisable to get the proper adjustment of the masks by means of narrow strips of bromide or other paper sufficiently wide to take in the sky line, and exposed under precisely the same conditions of lighting as the actual picture. It must be borne in mind that the effect produced by diffused light will be totally different, and therefore printing-out papers are not available.

Where the printing is done in the camera the process of vignetting or masking is precisely the same as that adopted in enlarging. A mask can be moved by hand between the negative and the lens, or between the lens and the plate or film. In enlarging, this operation is usually performed between the lens and the enlargement, that being the longer conjugate focus and practically the more convenient position. In reducing lantern slides by means of the camera, the longer conjugate is on the other side of the lens, and the mask is therefore more conveniently used between the negative and the lens, which position also better falls in with the usual lantern-slide arrangement.

A more accurate arrangement, especially for double masking, consists of an upright frame travelling on horizontal guides, in the same manner as the front of one of the modern portable cameras, and working by means of a rack and pinion. This is placed on the baseboard of the lantern-slide camera, between the negative and the lens, and is used to carry the mask or masks, which can thus be adjusted to the greatest nicety, and kept accurately in position. A slight movement backwards and forwards during exposure will give any desired degree of softening for vignetting, or an almost abrupt outline can be had if desired.

W. B. Bolton.

LANTERN MEMS.

A scientific gentleman in the North suggests a modified arrangement of polariser for use with the lantern polariscope, by means of which the rays are twice reflected from the original horizontal plane, first by means of a glass bundle set at an angle of 28°, facing downwards, and another parallel to it facing upwards, the combined reflection completing the polarising angle of 56°, the second reflection being naturally at a lower level.

* * * * *

This plan seems worthy of trial by those interested in polarised light, as it halves the comparatively large angle that makes the elbow form of polariscope a little awkward for quick use after the lantern has been used for ordinary projection, and which necessitates its being turned away from the screen, while any arrangement that allows of the lantern remaining nearly in its normal position will be a convenience. It is suggested that half the number of thin glass plates ordinarily used in a bundle should be employed in each, so that the parallel rays do not have to pass through more than the usual number to become fully polarised.

* * * * *

Many beautiful effects of crystallisation on the screen can be made by using a vertical attachment with a polarising bundle placed in the position of the reflector in front of the condenser (of course, set to the polarising angle of 56° instead of the one of 45°), and the optical front and analyser set above the stage in place of the ordinary lantern objective. If the bundle is of sufficient size to prevent unpolarised light passing, the colours reflected from the top mirror on to the stage will be, on the whole, satisfactory.

* * * * *

A very beautiful experiment is to dissolve Santonine in chloroform, and place it on a slide. This, when placed on the stage,

crystallises rapidly, owing to the quick evaporation of the chloroform, and so has a striking effect on the screen. Another good object is Narcotine in chloroform, but this is one of those substances which sometimes do not crystallise for some time after the solution has evaporated.

* * * * *

If one has an elbow polariscope, it can be arranged to show objects in a horizontal position by tilting the lantern and the polariscope attached by means of a support, so as to bring the stage horizontal, as will naturally occur when the suggestion is thrown out; but I do not remember it being noticed before, and as the projection of actual crystallisation of objects on the screen is a pleasing subject, likely to delight the audience, a portable framework will not be amiss for this purpose, to complete the equipment of the demonstrator who has only an elbow polariscope.

* * * * *

Any suggestion that enables an increase in the number of objects that can be shown by the lantern polariscope to be made available for the lecturer or operator should be welcome, for there is a limit to natural crystals, rocks, &c.; and, besides, crystallisations can be so much more readily produced. Besides these, are the experiments suggested by Mr. Legg and first exhibited by Mr. Woodward on the screen by employing a rhomb of Iceland spar for the analyser, instead of a Nicol prism.

* * * * *

This method gives a double image of the object under examination, and Mr. King, of Ipswich, found, according to Quekett, that nearly all structures may be made to exhibit colour by polarised light by so placing the object at the overlapped part of the two areas of illumination, and with a plate of selenite interposed between the Nicol prism polariser and Iceland spar rhomb analyser the two fields seen through, or projected by the rhomb, were the complementary colours of the selenite (say, red and green), the overlapped part being white light.

* * * * *

The micro-polariscope lends itself best to this plan with a comparatively low power, such as a two-inch objective, to project the phenomena on the screen, for then the separation is greater than with a higher power, and consequently a larger object can be used than would otherwise be the case. At the best, the object must be small, so as to be included in the neutral zone, or the overlapped part of the circles, and consequently white field.

* * * * *

The electric arc lamp and available electric current will greatly extend the use of projection microscopes and polariscopes, for the great drawback to their use (viz., insufficient light) is now overcome by an illumination of twice or three times the power of the limelight, and is readily adapted to existing lanterns.

* * * * *

With cylinder-makers, gas-compressors, and gas-users in conference as to the best methods of making the use and transit of gas cylinders as safe as possible, something practical ought to be evolved, for it could not be said that the meeting on Friday last at the Photographic Section of the Chamber of Commerce was not a representative one.

* * * * *

The information given generally was of a nature to show that, given a good quality of steel and care in making and testing of the cylinders, they were quite safe in use and when subjected to fair treatment; and, provided the gas-compressors still continue to adopt their present precaution, and use automatic cut-offs or valves to prevent over-charging, which they will naturally do for their own advantage both for safety and economy, there is little to fear from over-charged cylinders.

* * * * *

As to transit, the railway companies have already taken the initiative in that respect, and will only receive cylinders when properly packed, and, if sent by passenger train, a certificate as to their having been tested, and that they are of the approved strength, must be sent with them, or they will not be forwarded.

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The question of filling cylinders to a lower pressure was touched upon, and, although there are no insurmountable difficulties in the way of doing so if it should be preferred as a system, the feeling of the meeting was strongly in favour of the present pressure of 120 atmospheres being retained, as the experts say that the present make of cylinder is quite safe for that pressure if the cylinders are not over-tested and periodically reannealed.

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As to guaranteeing the make of the cylinders, one of the makers of cylinders present said there would be no objection to certifying to the quality of steel employed, and the proper course of treatment or construction; and it then remained for the gas-compressors to take up the matter, and certify for testing and annealing. This, as Mr. Murray pointed out, was already being done by the Oxygen Compression Companies, a mark indicating same, and year of test and annealing.

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An interesting and reassuring piece of information was from one of the compressors, that he could find no deterioration in cylinders after continued use; in fact, a cylinder recently tested, that had been supplied twenty-five years ago, was perfectly sound and good. Another item of information was, that the Government test had been raised for cylinders for ballooning purposes from one ton at first to one and a half ton, and for solid drawn to two tons. The latter, however, was probably before the expert evidence had been given on the Bradford type of cylinder, and the recommendation for a 1½ ton test.

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For certain physical experiments at the Royal Institution oxygen gas is supplied in cylinders at a pressure of 250 atmospheres, and the cylinders are tested to 300 atmospheres. This is enormously in excess of anything likely to be required by lanternists, and it is to be hoped that every care is taken of the cylinders in transit from the gas-compressor's works to the Institution.

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A note was made of a remark by one of the gentlemen present as to the value of pressure on the light, his experience being that he did not get such a good light with a high pressure as with a low one. As, however, most users of oxygen use the screw-down supplemental valves, or automatic regulators, the pressure can be made to suit any particular kind of jet employed, especially with regulators where the spring can be replaced at will by a light or strong one.

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No doubt from time to time improvements will be made in limelight jets, so that varying pressure of house gas can be allowed for, and the pressure of the oxygen supply made to suit same; but with mixed gas jets, unless a complete revolution takes place, it seems as if finality has been reached with the conical and internally polished nozzle and nipples, the orifice in the latter being proportionate to the pressure used.

G. R. Baker.

PACKING SLIDES FOR TRANSIT.—BINDING LANTERN SLIDES.

The number of journeys by rail and otherwise to which many lantern slides are nowadays perforce subjected, and the notorious smashing proclivities of both railway and postal officials render superfluous any apology for these few lines.

In packing slides for transit, two points deserve attention, *i.e.*, the way they are protected from injuring themselves, either against each other or against the box which contains them, and the means by which they are shielded from injuries more directly from without. It is one thing to construct a box which shall defy the tossing about it is sure to get in railway journeys of a few hundred miles, it is quite another matter to ensure that the slides within shall not get broken by being jarred against the interior of that box when made.

The latter point merits consideration first, and here I might observ

that all boxes in which the slides are held separated from one another by means of grooves should be eschewed. In the nature of things it is obviously impossible to make grooving to fit glasses of varying thicknesses, and, in consequence, bands of rubber or similar means have to be employed to grip them top and bottom and so stop rattling. Another drawback to grooves is that the breaking of one slide during a journey generally means the destruction of several more by the broken pieces getting thrown about the box against the others. A method of packing much to be preferred is to put the slides up in boxes holding a dozen or so with nothing in between them, these boxes being lined all over with felt or other soft material, and the slides wedged up against one another tightly enough to prevent any movement amongst themselves, but not so fast as to render it difficult to get them out; the felt should be sufficiently thick and elastic to do this easily. For this purpose nothing is better than a thick woolly material, which is used for putting under carpets and is readily obtainable. It is cheap, and will be found useful not only for this purpose but as a backing in large printing frames. These boxes can very well be made of cardboard or thin wood; if of the former, they are best made with a lid the whole depth of the box, similarly to the boxes in which dry plates are sold, but deep enough to hold the slides vertically.

These inner boxes can be inserted in an outer case, either to fit it tightly without any packing, or with a felt lining of the same description. This can hardly be made too strong if it is to stand many railway journeys, and in this connexion a previous experience I had in a similar case proved very useful. Having a number of account books to send periodically by rail a considerable distance, it was at first considered that a box of one inch teak, put together with plenty of screws, and with a hinged lid, with lock and key, would answer the purpose; but it was found that the abilities of porters, &c., had been very much under-rated. The box stood three or four journeys, and then arrived broken all to pieces, and tied together with cord by some kind hand. A similar experiment met with a similar result, and the difficulty was not overcome until a strong stay was put across the box internally, in the form of a partition, and all its edges were bound with iron. A case constructed on these lines is about the best possible way in which the inner boxes mentioned above can be packed, but the lid should not be fastened with a box lock, but with a padlock, or with long screws passing through dowels. If, when the slides have been so packed, there is no rattling sound when the box is shaken, it may be fairly assumed that they are safe from everything short of a collision.

While on the subject of packing lantern slides, I will mention a fact that I have noticed on many occasions, and in which I should like my experience confirmed or contradicted, and that is, that in the breaking of lantern slides it is very much oftener the cover glass than the actual slide itself which breaks. This has occurred with me so often, and is so utterly opposed to all one's usual ideas as to what an American author has styled the "cussedness of inanimate objects," that I am forced to the conclusion that the fact that one side of the glass is attached to a gelatine film—as far as I can remember, they have all been gelatine slides—acts, to some extent, as a protection. Whether this is actually the case or not I am unprepared to say, but in almost every case of breakages that I can call to mind this has held true, the proportions of cover glasses to actual slides broken being very noticeable, at least five or six to one.

Binding Lantern Slides.

There seems to be an attempt during the last few weeks to improve upon the primitive method of binding slides by means of black gummed paper strips hitherto in vogue, to judge by the linen binders and the strips cut to size, with trimmed corners, recently put upon the market. Certainly the old method left much to be desired, as did the metal binders sometimes used. With some people the strips could never be made to adhere, others made a mess of the corners of the slide, while even if these slight difficulties were surmounted, consciously or not, the binding soon wore out, or got torn and scraped off in the carrier. As a rule, slides which have been through a number of hands, none of them interested in keeping them in good condition, are in a woful plight as regards binding.

A well-known photographer, whose slides are always the very picture of neatness, to say nothing of their pictorial qualities, always makes his binding strips himself of a kind of bank-post paper, which is both thin and very tough, good starch paste being used for sticking. Paste or gum answers equally well for the purpose, but either are very much improved by the addition of a small quantity of glycerine. By this means the adhesive material never becomes absolutely dry, and does not, in consequence, peel off the glass; but care must be taken not to use too much glycerine. The drawback to the use of most kinds of fabric for binding is its thickness, which not only makes it difficult to use, but increases the chance of injury in the carriers. Thin, smooth bookbinders' cloth does not possess these disadvantages, and should answer the purpose well.

The way in which a slide is bound is also a not altogether unimportant factor when its safety is considered. In packing a number of slides together, they are far less likely to get broken if the binding is of uniform thickness all round where it comes in contact with its neighbours than if it is irregular and thicker at the corners or elsewhere. Besides, a good binding acts to a certain extent as a cushion between slides.

When a series of slides have been bound, it is often desirable to take some steps to know if all of them are there and in proper order. An excellent dodge for the purpose was recommended some few years ago; I have forgotten where or by whom, but it is well worth repeating. With a thick pencil, or a brush, of some colour which will show distinctly, one or more lines should be drawn diagonally across the top edges of the entire set when arranged in proper order, and all the same way up. By noticing whether this line is broken or not it can be seen at a glance whether the slides are correctly arranged, and, if not, which are out of order or not the right way up, and a good deal of time is saved which would otherwise be spent in looking for the label or the spots. James Lewis.

THE SEARCH LIGHT.

The Central Photographic Club boasts a model Honorary Lanternist in Mr. F. J. Carter, who, at his own expense, has provided a lantern with a twelve-inch objective, screen, gas bottles, and other accessories for the use of the Club on Lantern Nights. It is Mr. Carter's ambition to make the Central Lantern Nights the best in London, and I wish him every success in that aim. I am bound to say that, whenever I have been present on a Central Photographic Club Lantern Night, the projection system has invariably worked without a hitch. My compliments to you, Mr. Carter.

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What a strange body the Lantern Society is! I am informed by some friends who are expert in lantern matters that a week or two back the Society held a meeting, at which the makers and users of saturators gathered in force to discuss the latter's advantages and disadvantages, and that an amusing and profitable evening resulted. If this was a private meeting, neither I nor anybody else have a right to complain of the way in which it was engineered; but, if, on the other hand, the subject brought before the Society was of interest to lanternists generally (and such would appear to be the case), I beg to ask why the conductors of at least four of the weekly photographic papers were kept in ignorance of what was going on? The Lantern Society has nothing to lose by publicity—on the contrary; but, if it is to be "run" as a means for obtaining cheap advertisements by the few, why, then, its early demise may be confidently looked for.

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The annual entertainment (Ladies' Night) of the London and Provincial Photographic Association will be held on Thursday, March 8, at the Champion Hotel, Aldersgate-street, E.C., at eight o'clock. I have seen the programme. It comprises songs, recitations, music, and lantern slides. There will not be many of the latter, but they will be good. Altogether an enjoyable evening is likely to result. Admission is by ticket, and the tickets are sixpence each. As a further inducement to London men to attend in their thousands, with their sisters and cousins, their wives and their sweethearts, I will just mention that the proceeds, after paying expenses, will be handed over to that deserving institution, the Photographers' Benevolent Association.

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The editor of a harmless fortnightly publication, which varies a somnolent existence by occasionally making cryptogrammatic references to photographic and lantern matters, evinces a condition of mental hysteria at the fact that the new Council of the Photographic Society of Great Britain includes several men who have not long been members of the Society. This sapient and well-informed

gentleman says that there are *five* new men. There are only *four*. He also quotes five members with "honoured names" who were not re-elected on the Council, and apparently does not know why this is. I will tell him. Four of them did not stand for re-election. He also wants to know how "the matter" (*i.e.*, the introduction of fresh blood) was "arranged?" This, also, I will tell him. The four new men were spontaneously nominated and elected by the general body of members. Anything else, Charles? RADIANT.

THE PRESENT POSITION OF PHOTO-MICROGRAPHY.*

The Apochromatics.

TAKING first of all the results of Abbe's investigations, it is a matter of public knowledge now that on account of certain discoveries which were made with regard to glasses, and on account of the fact that glasses with different dispersion and density had been manufactured, Zeiss was able to make apochromatics which were a distinct advance on the objectives which had been previously made. I believe that all authorities on microscopic optics are of the one opinion that a very great advance was then made, affecting English manufacturers and probably American opticians also, who, seeing the principles of Abbe, produced glasses which are distinctly superior to the ordinary achromatics that used to be produced. It is true that lately Mr. Ives in THE BRITISH JOURNAL OF PHOTOGRAPHY has written in terms that make me believe he is inclined to say that there are ordinary achromatics of older type which can equal apochromatics under certain conditions. But, so far as I know, all the authorities whom I know or whose writings I have read seem to be of one opinion that apochromatics are the perfection of glasses as objectives at present stand.

Moreover, certain German firms have succeeded extremely well in producing glasses which, without professing the full perfection of apochromatic glasses, have a certain amount of that perfection, and are producible at prices under those of the apochromatic glasses. These matters are extremely important to photo-micrography as a science. Apochromatic glasses are extremely dear, and will in all probability be extremely dear, as they have to be made in such small quantities at a time. Further, one thing is to be noticed, that lately there appears to have been a certain amount of advance in the use of higher-power oculars than formerly in photo-micrography. Zeiss himself, in sending out his apochromatic glasses with the compensating eyepiece, does not claim that these glasses are usable to any perfection for photography with the compensating eyepiece; but attention has been called lately, for the last year or so, to the fact that they can be very well used indeed with the compensating oculars, although these were not originally intended for use in photo-micrography at all. Of course, this is a great power in our hands in some cases where we want very high magnification. I myself have not done any miracles in the way of great magnifications, but that [slide shown] is one instance where you have a magnification of 2000—no great thing perhaps—done with a No. 8 compensating eyepiece. It is a wonderfully perfect image, considering all things. I shall now show you a few examples illustrating the use of extremely high aperture by Dr. Van Heurck of Antwerp, with apochromatic glasses made by Zeiss.

[A number of slides were here shown and explained.]

These show one of the uses to which photo-micrography may be put and has been put. The next two slides are by a veteran photo-micrographist, Mr. Comber, who works by direct sunlight. To me it is astonishing how he gets through with British sunlight the amount of work he does and with such excellent result. [More slides.] The object measures $\frac{1}{141000}$ of an inch in width. Those are bacteria with extremely delicate flagella, by means of which they move. The next is a bacterium, which does not interest us to-day, so much as it might have done a short time ago. It is the bacillus of Asiatic cholera. It is really delicate work to stain these flagella and then secure the photograph when they are stained. The next is the bacillus of typhoid, by Dr. Bousfield; the flagella are extremely well shown. One more sample of the kind of flagellum with which we have to deal. That little organism is always found in putrid matter. These flagella, according to Dr. Dallinger, are only $\frac{1}{200000}$ of an inch in width.

Colour-correct Plates.

I am, I feel, bound to call attention to certain observations which have lately been made by Dr. Piffard, of New York, and partly followed by Mr. T. F. Smith, to whom I have before alluded, and also with regard to a certain amount of corroboration which was forthcoming from my own investigations. It is very interesting; but, as it has already been the subject of an address to the Photographic Society of Great Britain, I need not delay or keep you with it long. Dr. Piffard found that, when he used colour-correct plates with achromatic glasses, they gave sharp images, but the same glasses used with ordinary plates gave unsharp images. This is the long and the short of it. This was the first time that my attention had been called to the matter, but Mr. Ives has stated that he noticed the same fact many years ago. From what we know of Mr. Ives's connexion with colour-correct photography, his general ability, and the fact that he had a great deal to do with the inception of the general science of colour-correct photography, I think it is extremely probable that he had noticed those points before. If I did give credit for the observation where it was not due, it was entirely accidental, and not intentional. This is a very important matter in photo-micrography, because, as a matter of fact, with whatever glasses, ordinary or achromatic, results can be got practically equally good with the results got by the very expensive apochromatic glass, provided we do not require great apertures. I shall show four slides, instances of my own experience and experiments in this question, which will explain themselves. [Four slides of the blow-fly's tongue exhibited.] Mr. Smith kindly favoured me with some examples of research in which much higher magnifications were used. But I stick to something reasonable in the matter of magnification; you are better able to appreciate the result with ordinary powers.

With regard to the advantages conferred by colour-correct photography, I may say it is specially useful with medical preparations, stained tissues, and with insect preparations, favourite subjects with many, great advances have been made. I will show you examples of what I consider extremely good photographs by Mr. Carnell. [Slide exhibited.] That is the flea of a mole, which is an extremely difficult thing to photograph. [Slide exhibited.] That is the flea of a rabbit.

Photo-Micrography and Medicine.

It happens that my connexion with photo-micrography lies, to a large degree, in the medical line, and consequently you will not be surprised if I am inclined to lay great stress on the advantages of photo-micrography to medical men. It has a sort of double advantage, which is gained in this way, that photo-micrography helps medical men to a very great extent in the actual reproduction of their images; and, in the next place, it induces and teaches them to give greater care to the preparations, because it takes, as I have always said, two distinct sets of operations to make a good photo-micrograph—first, make a thoroughly good preparation; secondly, to make a good photo-micrograph from that preparation. Several medical men have been giving a considerable amount of attention to photo-micrography; I shall not waste time by more than mentioning the names of a few of those who have been successful in this way. Professor Crookshank is an old hand, and no doubt did a great deal to bring photo-micrography to the front, and at all events into use; Dr. Bousfield; Dr. Neuhauss, in Germany; and Mr. Mummery, President of the Odontological Society, who is not given much to making his productions public, but who has produced some extremely good work.

And, in conclusion, I should say that it would be better for medical men and others if they would use photo-micrography more than they do. An instance strikes me. A great deal of discussion has lately arisen as to organisms which are found in cancer, and which are stated by some to be the cause of cancer. These gentlemen, particularly the one gentleman (Dr. Ruffer) who was the apologist of these *protozoa*, as they are supposed to be, had exhibited drawings of the bodies in the cancers he had found. The drawings were really exquisite, and yet, in spite of these exquisite drawings, an enormous number of people utterly misunderstood and mistook the bodies that were in question, and had papers read and demonstrations given, to my knowledge, at various Societies, with demonstrations on the screen of bodies in various diseases which were supposed to be the bodies in cancer that Dr. Ruffer was talking about, but which were certainly not. I put it to them and you, if these bodies, instead of being sketched, however beautifully, had been photographed, there would have been no such confusion as there was. I will just show you them as a matter of interest. [Slides exhibited.] These show not only the characteristics of the bodies, but the positions in which they lie.

The capabilities of photo-micrography for general use, I believe, are practically unlimited. I do not think we know anything yet of what may come of photo-micrography in the future. But it is certain that, for all scientific men who have anything to do with microscopic images, sooner or later, it must come to this—their reproductions and records must be obtained, if they are to be of any real and lasting value, by means of photo-micrography. With regard to other applications of the microscope, we have had, at the Photographic Society of Great Britain, some instances where photo-micro-

* Concluded from page 12.

graphy has come in extremely handy. For example, we had a paper with regard to forgeries and other criminal matters which was extremely interesting and important. I believe no person will be wasting his time who gives himself to the study and the practice of photo-micrography from its best and very highest point of view. Photographers have the distinct advantage of having, at least, got over a great deal of initial difficulty. If a microscopist starts, he has to learn to get over serious trouble, in many instances, in producing good printable negatives. On the other hand, if the photographer is a young microscopist, it devolves upon him to learn thoroughly the use of the microscope. Where you have already mastered photographic work, I put it it to you that you will do well to take up, either as a hobby or constant pursuit, the study of photo-micrography.

ANDREW PRINGLE.

VARIATIONS IN PRACTICAL STEREOGRAPHY.

[Photographic Club.]

I HAVE before now suggested that great encouragement would be given to stereoscopic work if the organizers of photographic Exhibitions would provide classes for binocular slides and transparencies, and I see that, during the last six months, several Exhibitions have had such classes, while others to be held in the immediate future will give similar opportunities for competitive efforts of the kind. This is as it should be, for probably I do not exaggerate in saying that at the moment stereoscopic workers are to be counted by thousands. Nevertheless, some ill-informed and wilfully stupid writers have lately doubted whether stereoscopic work is popular to any appreciable extent, and others have rashly cast ridicule upon it, and in so doing have not only demonstrated their own ignorance of the primary principles concerned in the preparation of binocular pictures, but have also raised the suspicion that they have never seen a stereoscopic photograph in the way that it should be seen.

It is recognised by all intelligent photographers that the lens, the camera, and the dry plate help to produce no more beautiful effects, faultless alike in an artistic and a scientific sense, than those yielded by good stereoscopic pictures, and I am confident that, if it were known how easy it is to make them, and what pleasure they afford to those who photograph, and, above all, to those who do not, few amateurs could resist the fascinations of twin-lens work.

Of the three methods by which stereoscopic photographs can be taken I wish at once to dismiss two from further consideration, on the ground that they have only a limited degree of practicability according to modern ideas and ordinary requirements. These are, first, the displacement of a single camera so as to get two separate pictures from different points of view; and, second, the displacement of the lens on a single stationary camera by a semi-rotary movement in order to obtain the same kind of result. In outlining the conditions for taking binocular photographs by the third or twin-lens camera plan, I am possibly risking the accusation of retelling an oft-told tale, as, no doubt, you are already acquainted with them; but, as my motive is to provide matter for discussion on some variations of those conditions, you will, perhaps, pardon the repetition. Here, then, is stereoscopic photography in half a dozen sentences: Let the camera approximate to half-plate size, be of oblong form, provided with a collapsible septum equally dividing its interior, a front carrying two lenses of identical foci and apertures and a double cap or shutter ensuring both halves of the plate receiving simultaneous exposures. Let the print from the double negative be cut through a common base line, divided in the centre, each half reduced to a width of two and a half inches, trimmed so that between foreground objects there shall not, when the prints are mounted, be a greater distance than two and three-quarter inches, and also that the left side of the right-hand picture and the right side of the left-hand picture, as mounted, shall show a little more of the subject than the corresponding sides, with about one-sixteenth of an inch of the mount space between the two pictures. If suitably printed on a surface paper, and the subject depicted possesses certain obvious requirements for binocular treatment, a slide (or transparency), prepared according to the foregoing directions, will create a mental sensation of mingled charm, realism and verisimilitude such as no effect of light and shade, composition and colour, monocularly rendered, can ever approach.

SEPARATION OF THE LENSES.

Still, to several of the conditions I have enumerated, theoretical objection is sometimes taken. For example: In respect of the separation of the lenses on the camera front, much diversity of opinion has always existed. Personally, for most classes of subjects, including those where the nearest object is but a few feet from the camera, and open views, in which prominent foreground objects are relatively a considerable distance away, I find a mean separation of three inches avoid exaggeration of relief in the one case, and too little in the other. The teaching of Brewster to the contrary notwithstanding, a fixed separation, approximating to the normal distance between the eyes, is wrong in theory, however well it may answer in practice. In viewing an object near at hand, the degree of convergence of the optic axes is such as to enable us to appreciate its relative size and relief, but the further the object is from the eyes the less the optic axes converge, until, when looking at something, say, half a mile off, the vision becomes virtually parallel, and consequently, much of the effect of relief is lost. But, while the distance between the eyes limits this power of convergence, the separation of the lenses admits of increasing the distance of the points of view for remote objects, so that effects of relief and solidity are obtainable in the stereoscope which are denied to the unaided eyes. Hence it is not hard to realise the plausibility of the theory that, in stereoscopic photography, near objects should be photographed from points of view corresponding to the distance between the eyes, and that, in proportion as the nearest or most prominent objects in a view recede from the camera, so must the lenses be placed wider apart. It will be obvious to you that sometimes the object to be photographed will be at such a distance as to necessitate the removal of the camera many feet, yards, or even miles, from point to point, in order that the base line may be widened out sufficiently.

But it is not in reference to subjects demanding a telescopic angle for their stereographic delineation that this matter of the separation of the objectives concerns us now, but simply so far as ordinary work is in question, and I am interested to ascertain to what extent the theory will square with another having a bearing on the same point. In a careful and exhaustive treatise on *Theoretical and Practical Stereoscopic Photography*, published a little more than a year ago, the author, Dr. Donnadieu, of Paris, very fully treats of the separation of the objectives, and after condemning a fixed distance of separation, such as is generally adopted, goes a step further, and for several reasons, into which I need not now follow him, recommends that the lenses should be so separated on the camera front that their centres should exactly correspond with the centre of each half of the plate. After giving examples of what the separation would be with certain standard French sizes, he simplifies the terms of the principle by saying that the separation of the objectives should equal one half of the total length of the plate. This might at first sight appear another way of saying that the longer the focus of the lenses the greater must be their separation; but it is not so, for, according to the rule, if you are using, say, a pair of $5\frac{1}{2}$ doublets on a $6\frac{3}{4} \times 3\frac{1}{4}$ plate, the centres would have to be at $3\frac{3}{10}$ inches, on a $6\frac{1}{2} \times 4\frac{1}{4}$ or $6\frac{1}{2} \times 4\frac{3}{4}$ plate at $3\frac{1}{4}$ inches, on a $7\frac{1}{4} \times 4\frac{1}{2}$ at $3\frac{5}{8}$ inches, on a $7\frac{1}{2} \times 5$ at $3\frac{3}{4}$ inches, and on an 8×5 at 4 inches. All these are standard English sizes for stereoscopic work, and it seems to me that, by following Dr. Donnadieu's rule, considerable exaggeration will be produced in near objects. For that reason the rule is possibly unsound, except in so far as it ensures that the best part of the lens, that is, its centre, is always employed in its ordinarily proper place, viz., the centre of the plate.

THE CONVERGING-LENS THEORY.

Before quitting this part of my subject, I will notice one of the many heresies, if I may so esteem them, that cluster about stereoscopic work, namely, the converging-lens theory as applied to twin-lens work. Some people believe that the relief of near and distant objects is better rendered by converging the lenses, or, to put it another way, turning them inwards, and only the other day I heard the plan defended on practical, as well as theoretical, grounds. I fancy the falsity of the idea has been exposed before, but I now mention it in order to get your ideas upon it. It appears to me that lenticular convergence would produce such a degree of overlapping, not to speak of false perspective, that it would be as difficult to combine pictures so produced as it would be to combine stereographs taken with lenses of different foci. I can well see how easy it is to argue that, as the optic axes must converge in ordinary binocular vision, so also should the lenticular axes when taking a binocular view; but a little reflection will show that the functions of the eyes and the lenses, stereoscopically speaking, are not on parallel lines throughout.

DIMENSIONS OF STEREOGRAPHS.

For viewing stereographs by refraction the limitation of their width to two and a half inches, and mounting at not more than two and three-quarter inch centres by foreground objects, are so generally admitted to be philosophically correct, that those dimensions have almost passed into standards; but as to the height of stereographs no restriction steps in, and I therefore suggest that we might habitually extend the height of our slides and transparencies to four and even five inches. At present from three and a quarter to three and a half inches is the average height,

due, of course, to $6\frac{3}{4} \times 3\frac{1}{4}$ having formerly been chosen as the standard stereoscopic size. In the examination of stereographs of the extreme vertical dimension referred to, that is five inches, I do not think the eyes would be strained, and many objects would gain by the addition of an inch and a half in height. That the eyes would not suffer by having to take in a greater height is clear enough to me, at any rate, since, having the power of seeing binocular photographs stereoscopically without the use of a stereoscope, I find no inconvenience when examining them in that manner; and the same thing holds good when looking at them through the stereoscope. I anticipate an objection, that the American form of stereoscope does not easily permit you to appreciate anything above a three and a half-inch picture; but the difficulty is overcome by the employment of a stereoscope constructed on common-sense principles, and therefore having horizontal and vertical adjustments of the eyepieces.

Trimming and Mounting.

Adverting now to trimming and mounting: By leaving a small space between the mounted prints, as well as allowing the two sides which come together to embrace a little more of the subject than the sides that do not, relief between the picture and the mount is secured, and the effect of looking at the former through an aperture is intensified. With transparencies, a like effect is produced by having the inner edges of the masks at nearer centres than the pictures as a whole; but, as to paper slides, the dividing space is not always allowed for, and it is a moot point whether any of the effect is, in consequence, sacrificed. Again, as to the edges coming together including more of the subject than the edges which do not, I have seen many slides in which this *desideratum* is not only disregarded, but the excess of subject shown on the extreme outer margins of the pictures; and, notwithstanding this inversion of the general rule, the coalesced images did not appear deficient in relief and solidity. I had prepared a number of binocular prints, which lack of time during the last week or so has prevented me trimming and mounting in accordance with the various systems here described, so that you might compare the differences in effect, if any. Accompanying Dr. Donnadieu's book, however, are a number of collotype stereographs, which will not only partly illustrate the foregoing remarks, but will show that so painstaking an authority as he appears to be, ignores the necessity of a difference of included subject at the inner margins as compared with the outer. In most of these pictures, as you may observe, there is more of the subject on the outer margins, and in others the difference is so slight that the two supposedly dissimilar views look like duplicates; yet, seen stereoscopically, the effect is all that could be expected. On a future occasion, if the subject is of any interest, I will give you the opportunity of judging in the stereoscope which system of trimming and mounting is preferable.

Thomas Bedding.

THE MAGNESIUM LIGHT IN MINE PHOTOGRAPHY.

In a paper on *Photography in Mines*, recently read before the Midland Institute of Civil and Mechanical Engineers, the author, Mr. Herbert W. Hughes, thus discusses the kind of illumination necessary for photographing in mines:—

The incandescent electric light is practically useless. The writer has exposed a plate for thirty minutes at the bottom of a shaft which seemed brilliantly illuminated, using stop *f*-16, and only succeeeded in obtaining an impression of the incandescent lamps themselves, and of their surroundings, to a distance of not more than six feet.

The arc electric light gives far different results, and is somewhat largely employed in obtaining portraits on the surface. Under ground, the conditions are different. Portrait lenses do not give good results, and, if the next best lens is employed, it means four times the exposure necessary on the surface; it is also practically impossible to arrange reflecting surfaces in the happy manner that can be carried out in the studio. The inconvenience of carrying the cables into working places is left out of consideration.

Messrs. Dewey & Bretz obtained a series of views in the mammoth seam at Kohinoor Colliery, Shenandoah, Pa., with the aid of the arc electric light, specially erected in the mine for such purposes. They used five lamps, each giving 1600 candle power, but, even with a diaphragm of *f*-16, exposures of from ten to thirty minutes had to be given. At the Chicago Exhibition the South Duffryn Colliery Company exhibited two underground photographs taken by the Photophane Company of London at their Abercanaid Colliery, which were obtained with the aid of the arc electric light. The plates had an exposure of from fifteen to twenty minutes, using stop *f*-16. Any one who is acquainted with working mines need not be told that this is too long for a person to remain perfectly steady if he is to be shown in the act of performing any operation connected with getting coal, and from the prints which the writer exhibits it appears that no man can stand still for such a length of time, even when placed in a lounging attitude and supported. Putting aside the inconvenience, even with moderate lenses and rapid plates, the electric light seems quite inapplicable to photography in mines.

When artificial illumination is employed, the light must not only have a high degree of intensity, but be rich in rays which are chemically active, viz., green, blue, and violet. The metal magnesium, when burnt in air, gives a powerful light, rich in actinic rays; and as early as 1865 it was used for obtaining photographs by artificial light. Messrs. Debenham and Sopwith both employed it in the form of ribbon. The former cut a number of lengths of the ribbon, tied them together at one end, and thrust the other end into a lump of clay stuck against a sheet of tin, which was used as a reflector, and held in the hand. Mr. Sopwith's lighting arrangements consisted of a number of tin reflectors, usually from three to five, shaped to parabolic curves to concentrate the light, before each of which was burnt from six to ten inches of magnesium ribbon. The art of lighting consisted in using the lamps at suitable distances, and frequently the foreground was made up by secondary lighting, after the holder of a lamp had withdrawn from his position. At the time these photographs were taken the ordinary flash lamp was unknown.

The writer first used two regulating magnesium lamps, the ribbon being wound out as fast as it was consumed in the burner in front of the reflectors. An exposure of from two to four minutes was given, using stop *f*-16 and a Mawson plate. It became at once apparent that, while similar illumination had been successful in Mr. Sopwith's case in the comparatively thin seams of his district, it was useless in the thirty-feet seam and its large working places. Only one of the numerous attempts made in the ten-yard coal was successful; but fairly good results were obtained in the Silurian limestone mines, where the working places are similar in size and arrangement.

What is required is a very brilliant light for a short period, and to produce it a large quantity of magnesium must be rapidly burnt. Flash lamps, in which magnesium in the form of fine powder is blown through a flame, usually burning alcohol, satisfy the requirements, and, providing a number be used, any desired illuminating power may be obtained, and, if these be distributed, softer effects in the lighting would result. Often, however, the space in which the camera has to be operated is so confined that it is impossible to properly use one lamp, and in some cases it cannot be fixed on a stand, but has to be held in the hands of an assistant. Mr. Burrow found the smaller flash lamps ordinarily purchasable to be useless for the principal lighting, and designed two powerful ones, each having three orifices, and consuming three-quarters of an ounce of magnesium powder for each flash. The two were supplemented in large areas by a few smaller lamps, and sometimes by one or two oxyhydrogen limelights.

Anything burnt in oxygen gives a far more brilliant light than when burnt in air, and it is stated that magnesium gives twelve times its ordinary illuminating power when so consumed. All the writer's best results have been obtained by employing the lamp designed by the Platinotype Company, in which magnesium powder is burnt in the oxyhydrogen blowpipe.

Two main lamps are used, one on each side of the camera, and these are supplemented by an Optimus flash lamp, which is said to be of 1000 candle power. In addition, secondary lighting has often been given by the ribbon lamps, after the main lamps have stopped, to such places as appear to have been in shadow during the principal illumination. As everything is so dark underground, this procedure is easy; the cap may be left off the lens, and persons may move about in front of it provided the ground they travel over is not illuminated. In the subsidiary lighting the lamp itself may be in front of the lens provided great care be taken to shield it and prevent any rays of light going direct to the camera. A view is shown to illustrate the result of the neglect of such precaution; there is a dense opaque spot on the negative, producing a white patch on the print. Another necessary precaution is to prevent any of the secondary light being thrown on to places where men were standing during the first lighting, such men having been moved away. If such a thing does happen, the details of the timber supports or coal face are visible through the miners, and "ghost" photographs are obtained.

The impossibility of properly composing the picture on the ground-glass screen adds an amount of doubt to the uncertainty of obtaining any desired view. What is generally done is to arrange a series of lamps or candles about the main objects, and endeavour to get all these on the screen. After this has been done, it is sometimes possible to burn a short length of magnesium ribbon and examine the view thus revealed, but in many cases such procedure is impracticable, as the smoke produced will not clear away in reasonable time. Focussing is equally uncertain. What is done is to place a light somewhere in the middle distance, and get that point sharp. Now, if the view could be seen on the screen as it is when working on the surface, it is often possible to sacrifice sharpness in an unimportant part, and thereby obtain a clearer representation of several other points of importance. It sometimes happens below ground that the uninteresting points are in focus, while the important ones are indistinct.

CLOUD PHOTOGRAPHY.

"La Nature" recently printed an article by M. A. Angot on the methods he has been employing in order to obtain the excellent photographs of clouds exhibited at the Paris Physical Society at the beginning of last year. The following is a free translation of the article:—

It is well known that ordinary photographic plates are most sensitive to blue and violet rays, hence the blue background of the sky acts, in general, nearly as much upon the plates as the white parts of clouds, which are thus rendered almost, or entirely, indistinguishable upon the photograph. It is possible, however, easily to obtain views of an interesting effect when, on a background of blue sky, large clouds pass before the sun. The edges of the clouds are then lit up to such an extent that they make much stronger impressions upon the sensitive plate than the sky itself; the remainder of the cloud is, on the contrary, dark, grey or black, and does not come out as well as the sky. To obtain an accurate picture under these conditions, it is necessary to develop with great care; or, better, to use a dilute pyro developer—a few drops of bromide of potassium solution and very little pyro to begin with; the development is then slowly carried on with the addition of carbonate of soda, and pyro is only added again towards the end if the plate lacks clearness.

This method ceases to give good results when it is applied to ordinary clouds, and becomes altogether useless for cirrus clouds. But these are precisely the clouds the study of which is most interesting; they are composed not of water vapour, but of ice needles, and their forms and movements are closely connected with changes of weather. Cirri are the most difficult to photograph because, being farther from us than other kinds, they are less brilliant; and, further, when they are seen, the sky is very frequently pale blue in colour, or covered with a milky veil, which diminishes the contrast.

Numerous plans have been proposed to photograph cirrus clouds. The first consists in photographing from the summit of high mountains, but that method is not within the reach of everybody. At such places the sky is, in general, much darker, and the clouds are better seen upon the background, so that excellent photographic images can be obtained without special devices. Another method has been proposed by Professor Riggenbach, and appears to have some advantages. It consists in photographing the sky, using a diaphragm so small, and giving an exposure so short, that only a trace of the cloud-image appears after development. The plate is then intensified, and the image brought out by means of bichloride of mercury and sodium sulpho-antimoniate. This method, however, has little to commend it. In the first place, intensification is always inconvenient and destroys details; and, further, the sodium salt very rapidly deteriorates, so there is always a risk of the plates being spoiled by becoming a very intense yellow colour, or being covered with a metallic deposit.

Professor Riggenbach has suggested another and a better method, which is found to give excellent results. The method is based upon the fact that the blue light of the sky is partially polarised, whilst the light of clouds does not possess the same property. If, therefore, a convenient analyser (a Nicol prism or black glass inclined at 55°) is placed in front of the lens of the camera, only a portion of skylight is obtained, while the light of the clouds remains unaltered, and the increased contrast renders it an easy matter to obtain a good picture. But, at the same time, this method possesses inconveniences. The proportion of polarised light is far from being the same in all parts of the sky, hence it is not possible to photograph clouds in any direction. Moreover, many photographers object to the complications which are involved in the introduction of an analyser in front of the lens of the camera.

There is still another method, unquestionably the most simple one, and the one which, at the same time, gives the best results; it is the employment of coloured screens. In front of the lens of the camera is placed a screen which transmits yellow and green rays, but is opaque to blue and violet rays. The light of clouds is rich in yellow and green rays, hence a large proportion of it is able to traverse the screen and act upon the photographic plate; while, on the other hand, the blue background of the sky emits very little yellow light; in fact, the proportion of rays of this refrangibility decreases as the blue colour increases in depth, so its action upon the sensitive film is considerably diminished or altogether obviated. The only inconvenience of this method is that yellow and green rays have very little action upon an ordinary photographic plate. Under these circumstances, it would be necessary to give a very long exposure, which is impossible in cloud photography, on account of the movements of the objects and the rapid changes of form. It is probably for this reason that coloured screens, which were adopted in the earliest stages of cloud photography, appear now to have almost been abandoned. But this difficulty has been practically overcome by the production of the orthochromatic or isochromatic plates of commerce, which are sensitive to yellow and green light.

M. Angot finds that the best brand of plates for use in cloud photography are the Lumière orthochromatic and Edwards' isochromatic. Other brands have been tried, but none gave better results than these. As to the yellow screen, the best is obtained by placing a cell, having parallel faces about five or seven millimetres apart, in front of the lens, and filling it with an almost saturated solution of bichromate of potash, to which a few drops hydrochloric or sulphuric acid have been added. A mixture of saturated solutions of bichromate of potash and copper sulphate, in the proportion of three of the former to one of the latter, may also be employed. In either case the cell is hermetically sealed, and it can easily be fixed in front of the lens or behind it in the bellows of the camera.

Evidently it would be simplest to use a screen of coloured glass, and, as a matter of fact, certain glasses give as good results as the cell containing one of the above-mentioned solutions. But most yellow glasses are quite inadequate for the purpose. It is to be hoped that coloured-glass manufacturers will soon make a glass which will transmit exactly the same rays as the solutions. It will be a good thing to have a series of glasses of graduated tints, the clearest to serve for very bright white clouds standing out boldly upon a fine blue sky, whilst the darkest could be used for faint clouds when the blue colour of the sky is not so pronounced. The time of exposure must, of course, be increased as the glass used is increased in tint.

As photography is being widely used in the future to increase our knowledge of clouds, it is recommended that the date and hour of exposure be written upon each picture. M. Angot's photographs are a sufficient testimony of the excellence of his method of work, and their multiplication in different parts of the world would considerably extend our knowledge of cirrus clouds, and very probably prove of use in forecasting weather.

FLASHLIGHT PHOTOGRAPHY.

The first serious attempts at portraiture by artificial light, says *Anthony's Bulletin*, were made somewhere about 1858, pyrotechnical mixtures being used, with reflectors and diffusing screens. Later the light from sulphur burning in oxygen or dropped upon molten potassium chlorate was tried. In 1859, Bunsen and Roscoe noted that the light from burning magnesium was well adapted for photographic purposes, and this resulted in the quite extensive use of band lamps. These are still in use, and consist of a train of clock wheels driven by a spring. The motion is regulated by fly wings, which may be set at any angle. The feed motion should be regulated so that the rate of feed is slightly greater than the rate of burning, and the magnesium ribbon is then pulled back occasionally. Here the chief difficulty encountered is the irregular burning of the magnesium, due to its partial oxidation and to traces of impurity. Any sudden jerk or draught of air readily extinguishes the flame. Perhaps the best method for the use of magnesium ribbon is to plait it and make a magnesium torch. This gives a larger and more steady flame, and less harshness results. A number of strands of magnesium ribbon are loosely twisted around each other, care being taken to avoid sharp bends or any tightly twisted places. Magnesium, however, is now mostly used in the form of powder. It should be kept dry, and should be of a silver-white colour. If it be mixed with sand, a flame of long duration may be obtained by dropping the mixture from a funnel on to a long strand of absorbent cotton which has been saturated with alcohol and ignited. The pure powder blown through a flame gives a very quick flash. In a flash lamp the magnesium powder, in order to give the maximum illumination, must all pass through the flame and must be projected with force. To prevent the distortion of the flame by the current of air, the projection of the powder by means of a small spring gun has been suggested. Dr. H. G. Piffard, of New York, devised the method of spreading the magnesium upon gun-cotton and igniting the latter—a fairly satisfactory method, but not so convenient as the flash lamp. The production of a flash by igniting a mixture of nitric oxide and carbon bisulphide has been tried, and a very actinic light is produced. A few drops of carbon bisulphide are placed in a glass cylinder containing nitric oxide, and a light is applied. The extremely objectionable odour and fumes will prevent any general adoption of this method.

Lantern Queries.

W. Greenwood.—Received.

Crux.—Better write the Brin Company, Horseferry-road, S.W.

Lime.—Such limes are obtainable of Messrs. G. Boor & Co., Bishopsgate-street Without.

J. Rice.—The metal-bellows regulator is made by the Scotch and Irish Oxygen Company, Glasgow.

Screen.—Messrs. Avery, Great Portland-street, or Messrs. Gill & Son, Warwick-lane, E.C., supply such screens as you require.

R. T. Forwood.—Yes; the Hill Norris collodion lantern plates are found, we believe, to answer well. Intensification, as a rule, is not necessary.

Colin.—The electric signal you refer to is made by Messrs. Butcher, of Blackheath. We noticed it in last month's Lantern Record. It answers very well.

R. C. C.—As you have only a few slides that you require coloured, you had better communicate with some one of those who make slide-colouring a speciality. See advertisement pages.

Pyro.—1. Any dealer in lantern materials will supply you with a black varnish suitable for blocking out parts of slides. 2. Possibly Messrs. Perken, Son, & Rayment, Hatton-garden. 3. Tyler, Waterloo-road; Chadwick, Manchester; Newton, Fleet-street, E.C.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] (April 6, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

The close of March virtually denotes the termination of the lantern season, especially among photographic societies, and those whose business it is to employ the lantern in public entertainments, lectures, and the like. Nevertheless, for enlarging purposes, photo-micrography, transparency work, and other subdivisions of photography, projection apparatus is necessarily employed, even during the summer, so that it is scarcely accurate to conclude that lantern work suffers total neglect during the long days and short nights.

* * * * *

With the great majority of photographers, however, lantern work usually recedes into the background during the summer; hence, from the present time till next autumn, while devoting in The Lantern Record just that amount of attention to the optical lantern which will be called for, we propose to set aside a large portion of its space to treating of cognate and allied subjects.

* * * * *

Hand-camera work, photo-micrography, stereoscopic photography, enlarging, transparency-making are departments of photography which suffer no diminution of interest in the summer, and we shall make it our aim to ensure that they are dealt with in these columns from month to month. It will be seen, as we have said, that each branch we have named is allied to optical projection in some degree.

* * * * *

We all know that the optical lantern nowadays plays a large and useful part in religious services, but we suspect that opinions will differ as to the wisdom and taste of the uses to which it was recently put by certain so-called "religious" persons at Hastings. In that town, according to "Dagonet" of the *Referee*, there was a meeting of that mawkish body, the Lord's Day Observance Society. Mr. Sims says: "Very dreadful, no doubt, to the members were the scenes of Sabbath-breaking and immorality thus described—so dreadful, indeed, were they to witness that, at the conclusion of an address, a member '*illustrated by large views, shown by limelight, the scenes which he said could be vouched for by eyewitnesses as having occurred on the steamboats, in the fish-market, and in the streets.*' One really doesn't know *what* to say to that. Awful immorality in the streets reproduced as a magic-lantern entertainment for the benefit of the ladies and gentlemen of the Lord's Day Observance Society! These good folks are getting on. They will be quite up to date presently, and then, perhaps, they will be giving their subscribers something of the same sort in *tableaux vivants*."

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Mr. F. E. Ives has recently issued a *Handbook to the Photochromoscope*, with chapters on the nature of light and theory of colour, the latter being culled from the works of recognised authorities on the subject.

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In Mr. Corney Grain's last society sketch, "A Funny World," politics are brought for the moment on the *tapis*, Mr. Grain pointing out how fitting is the present tendency to unite electioneering with entertainment, since the politician who derives assistance from the magic lantern can "change his views" as often as he pleases.

* * * * *

The supplementary list of optical lantern slides issued by Mr. Alfred Underhill, of 32, Clarendon-road, West Croydon, includes several series of a religious nature suited to Ascensiontide, Whitsuntide—the Holy Land, Scripture texts, &c.

* * * * *

Mention of transparency work reminds us that this system of positive reproduction is scarcely so much practised as it might be. The beauty of a good photograph on glass viewed by transmitted light does not easily lose its attraction to the eye, and, when it is considered how capitally transparencies are adapted for window decoration, it needs nothing further to recommend the opportunity of combining æstheticism with utilitarianism which transparency-making affords.

* * * * *

The Incandescent Gas Light Company, of 14, Palmer-street, Westminster, have recently issued a circular in which they thus describe the new Welsbach "C" gas burner:—"This burner is well made and highly finished; it consumes a trifle more gas than the other burners which, up to now have been sold by this Company, *i.e.*, with one-and-a-quarter-inch pressure three and a half feet; at a higher pressure, four cubic feet of gas are consumed per hour, and the light obtained with these burners varies from sixty to seventy candles, according to pressure. Although this may not convey the exact amount of light obtained with this burner, let us explain that sixty to seventy candles is about two to three times the amount of light obtained on the average with the old burners, or four to five times as much light as an ordinary Bray's burner. In constructing this burner, we have directed special attention to obviating the difficulties as regards replacing mantles, with the result that this has been made so simple as to bring it within the reach of any one—thus making the system more than ever suitable for private houses, by the removal of previous drawbacks. The burner is made in two parts, *i.e.*, the Bunsen tube and the gallery; the former need never be removed when once fixed, but the latter (to which the mantle and chimney are attached) can be slipped on and off without any trouble. This removable gallery admits of a very great simplification in the removal of mantles. We know that some people find it very difficult to put on a mantle, but with this burner the mantles can be renewed by our customers returning to this office, or to our agents, the broken and damaged mantle, with gallery and chimney, and we return to them another gallery, fitted with a new mantle and clean chimney. Customers living away a good distance ought to have one or two of these spare galleries, with mantles and chimneys, in stock, to replace

the broken mantle by putting up the reserve gallery. The system now works very easily. We have had mantles burning five or six hours daily, lasting for eight or nine months, giving this brilliant light, and proving that the fragile nature of the mantle is no bar to its use for longer periods than can be claimed for the filament of the incandescent electric light. In addition to this, the breaking of the chimneys has been obviated to a considerable extent. We have adopted a central support, by which the principal cause of the breaking of chimneys—that is, the side rod or wire—has been removed."

THE HAND CAMERA OF THE FUTURE: A PLEA FOR STEREOSCOPIC HAND CAMERAS.

Not only does the hand camera appear to retain its hold upon all classes of amateur photographers as the most convenient and practicable and, within certain limits, the only useful form of camera for outdoor work, but the fund of inventive skill that calls into existence new types of changing and storing methods for the sensitive plates or films (the only important point, perhaps, in which there is now a possibility of one hand camera appreciably differing from another), does not appear to lessen. It is really wonderful, the amount of cleverness and ingenuity that has been devoted to the perfection of the hand camera within the last seven or eight years. This, however, by the way. Prophecy is always a dangerous pastime, but we are not without evidence to back up the small venture at foretelling the future in which we have indulged in the headline to this article. The hand camera of the future, we believe, will be the stereoscopic hand camera.

Those photographers—and they, curiously enough, are very numerous for this enlightened period—who have never seen a stereoscopic picture of any kind, be it a view, portrait, interior, or group, have not only missed one of the most delightful experiences which photography is capable of affording, but have deprived much of their own work of half its interest and value, and very frequently fall into the pitiable blunder of ridiculing what they do not understand, *because* they do not understand it. During recent months, however, we have come across many intelligent amateurs who have newly taken up stereoscopic work, and have been witnesses of their pleasure at the nature of the results they so easily obtained. Some of these gentlemen were among those who formerly smiled at the efforts of a few enthusiasts to popularise binocular work, and now they themselves have become its warmest advocates.

If we consider the relationship which a stereoscopic picture of a portrait, view, or group, bears to a monocular rendering of the same subject, there will be no difficulty in understanding why, even on the unsentimental grounds of common sense and ordinary reason, the former is to be preferred. It shows everything that the monocular picture does not: distance, height, roundness, relief, atmosphere, —the realism of actuality, in fact. Of all these characteristics your monocular pictures are deprived. Now, the hand camera is very largely used for street views, crowds, shipping, bustling scenes on racecourse, beach, or sands, and all the thousand-and-one occasions where life and movement have to be rapidly caught and impressed on the sensitive film. Of such photographs many hundreds of thousands must be annually taken; but they lack life and realism, they do not show the scene as the brain and the eye saw it, the charm of reality is absent, be the lights and shadows ever so cunningly caught. But treat and exhibit such scenes stereoscopically, and view and people seem to spring into existence once more, with all the roundness, relief, separation, and charm of the original. Are we not justified, then, in urging that the possibilities of hand-camera work as exemplified in the instantaneous stereoscopic treatment of animated scenes and groupings are scarcely yet recognised?

As we write, several French, German, Italian, and other publications are before us, and in these we observe illustrations and descriptions of quite a considerable number of stereoscopic hand cameras, from which, as well as from other indications, we draw the conclusion that hand-camera stereography is far more practised by our Continental neighbours than here at home. At the moment, we can only recall two English firms who are making stereoscopic hand cameras —Messrs. Newman & Guardia and Mr. J. R. Gotz; but, doubtless, others will soon follow suit. Objection is sometimes taken to the use of a hand camera for stereoscopic work, on account of the difficulty of holding it perfectly level, so as to get a horizontal baseline, but this objection is, we think, founded on a misconception, We have worked in the company of many skilful hand-camera men, who we have observed, from the nature of the results subsequently shown us, have easily held their cameras so level that, even in architectural subjects, the lines were as correctly rendered as they would have been by a stand camera, carefully levelled. Indeed, in this respect it is remarkable what a degree of accuracy and nicety many men have cultivated. Hence, as with the requisite care and experience equally good results, as regards rectilinearity of subject, could be obtained with a binocular as with a monocular hand camera, we consider the objection quoted as untenable.

As regards the practical requirements of a stereoscopic hand camera, it will be obvious that the size of the plate employed, which approximates to half-plate, will put a magazine form out of court, so that a changing back or slides will be necessary. In point of fact, dark slides are provided in the numerous Continental forms we have seen illustrated and described. If the greater dimension of the plate makes the stereoscopic hand camera rather wider than many, but not all, monocular instruments, there is a gain in decrease of height by the absence of internal changing appliances. Of course, a collapsible septum is essential. Most of the forms to which we have alluded are of variable focussing power, have a finder fitted on the top of the camera between the two objectives, have the double shutter, actuated by pneumatic or spring release, working between the lenses, and the front, which carries these latter, with a rising movement. Of course, like the stereoscopic camera used on a stand, there is no reason why small single pictures could not be taken when required, or, by the removal of the septum and the substitution of a single lens, with a suitable shutter, half-plate hand-camera shots; and, if, as would of course be the case, the camera could be used on a stand as desired, your binocular hand and stand camera would be the *beau-idéal* of an instrument for varied work.

We commend the question of the binocular hand camera to the attention of hand-camera makers and users alike. The practical difficulties in the way of making efficient stereoscopic hand cameras are extremely limited; indeed, a little reflection will show that all that is wanted is an instrument constructed on the simple lines we have laid down above. Finally, as to the manipulation of the stereoscopic hand camera, though this possibly demands some little forethought and judgment, differing slightly from that required with monocular hand-camera work (a subject we shall treat of in a future article), we are sure that photographers will, in the preparation of slides and transparencies from negatives obtained in the stereoscopic hand camera, unearth a new and not easily dispelled pleasure.

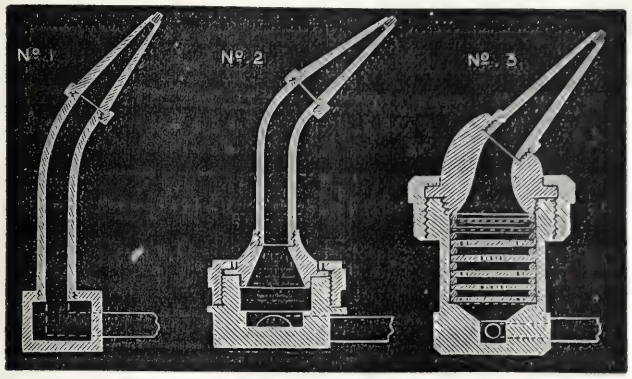
LANTERN MEMS.

The construction of limelight jets must always be a subject of interest to lanternists, and, as the value of mixing chambers in jets has been questioned by one of your correspondents, I have had fitted up, as promised in a recent letter to the Editor, a jet without a mixing box for trial against jets having mixing boxes of various types.

* * * * *

In order that the comparison should be quite fair, the same type of jet, nozzle and nipple, was taken as that usually supplied by the firm in whose establishment the experiments were conducted, and the various types of jets with mixing boxes taken out of stock without any preparation. One was fitted with a nozzle of the curved order, with gradually tapered nipple, smooth and free, without any shoulder, and having a small dome at the other end, fixing by means of a screw-capped washer to a fair-size mixing chamber. The other was as figured and described in Mr. Lewis Wright's book, with a large mixing box and intercepting discs enclosed in same, and a straight, conical nozzle fixed at an angle into the dome at top of

mixing chamber, which we will call No. 3, and the other No. 2, while that without mixing chamber is No. 1. (See illustrations.)



* * * * *

A BIUNIAL LANTERN was employed, with identical optical systems, and in each of the stages were placed a half disc of metal, so that the projection from each lantern filled half the screen. The jet, without the mixing chamber, was worked up to give the best possible light without roaring, and then the ordinary best form of mixing box jet was gradually brought to its best point of illumination, with the result it was far in excess of the one without mixing box, and, when the latter was made to give the best light it could even with roaring, the other was still in excess and quiet.

* * * * *

THE No. 3 jet, with the large mixing chamber, was tried against the smaller mixing chamber (No. 2), and it was found that a better light could be obtained; but the greatest advantage of all was the complete control over the light, in fact *it was far more manageable.* As it happened that a well-known lanternist and demonstrator called in to see me about some other lantern matters, I asked him to witness the experiment, and see that everything was tried impartially, and I think I express the opinion conjointly arrived at, that mixing boxes are absolutely necessary for best results, and it would be a retrograde movement to go back to jets without.

* * * * *

THE old theatre limelight jets and the earlier form of lantern jets were so made, but then a noisy jet was not considered so much a drawback as an indifferent light. In the improved forms, as mentioned in Nos. 2 and 3 above, the light is the maximum so far obtainable, and there is no noise even when the full pressure of hydrogen is being used, providing it is gradually worked up to its best point. In the trial referred to, the nipple was interchanged from the jet without mixing box to one with a mixing box, and each separately compared with a standard jet so as to verify previous conclusions, and it was found that the result was positively in favour of the jet with mixing box.

* * * * *

THE reproduction of coloured pictures and plates is often required by lecturers, and unless one finds an artist of special capabilities, and is willing to pay a high price for a black and white copy from which to get a photographic transparency, it is impossible to get a reproduction that will give such colours as scarlet and other reds in proper shade and brilliancy. As a rule, the photographs taken direct from coloured plates prevent anything like the right colour being produced when afterwards hand-coloured and projected on the screen, for they look nearer black than scarlet or red.

* * * * *

RECENTLY there was occasion to reproduce as lantern slides some excellent coloured drawings of military uniforms of various periods, from the foundation of the regiment to the present day, and notwithstanding all sorts of dodges and various plates tried, perfect pictures could not be projected on the screen from them after the transparencies were coloured by lantern-slide artists of acknowledged ability.

THERE are so many fine paintings one would like to see reproduced as lantern slides particularly from the old masters and such subjects as birds of fine plumage, &c., that a plan of producing really fine coloured lantern slides would be a boon. The detail of some pictures precludes the possibility of drawing direct on the glass, and the cost of doing so on card in large size is too expensive, and takes up too much time, to be resorted to except in isolated cases. If our plate-makers would give this matter serious attention, I think, if success crowned their efforts, they would find it pay them well, and, besides, they would confer a distinct benefit on lantern-slide producers.

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MR. NELSON'S carefully prepared paper *On the Determination of the Foci of Microscope Objectives, Lantern and Camera Lenses, and of the Screen Distances of Lanterns by Simple Arithmetic,* as published in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, cannot fail to be read with interest by all lanternists. Without taking it in detail, the first conclusion one comes to in comparing the results with those previously published, at least as far as lantern discs and distances are concerned, is that the old table is practically correct if taken as the distance *from the lens when in focus,* while the table by Mr. Nelson is exact if taken *from the slide* in the stage.

* * * * *

FOR enlarging and photographic camera work, and where the exact foci of lenses are not known, and cannot readily be found, the formula given will be of much value, but for lantern work, where the size of commercial lantern-slide masks varies so much (from $2\frac{1}{8}$ inches to $2\frac{3}{8}$ inches, and sometimes to three inches diameter), a little margin must be allowed for on the screen, and consequently the cut-and-dried old rules will, with most lanternists, be "near enough" for practical work. These old rules may bear repetition, and are as follows:—(1.) To ascertain the distance the screen should be from apparatus (front lens), divide the screen picture required by the diameter of the largest photograph or slide to be used, and multiply the result by equivalent focus of the lens employed. (2.) To ascertain the size disc a certain lens will produce at a definite distance from the screen, divide the distance by the focus of the lens, and multiply result by diameter of largest photograph or picture to be shown. It must be borne in mind that all distance measurement must be taken from the front lenses, the diaphragm, in the Petzval form of lens, and the position midway between the cells in the case of combination plano-convex achromatic lenses, being the point of measurement. Mr. Nelson's table will, nevertheless, be a valuable and useful one for a lanternist's reference.

G. R. BAKER.

THE SHAPES OF LANTERN MASKS.

FEW lantern workers will be indisposed to agree with Mr. Hector Maclean in his remarks on the absurd opinion quoted by him a fortnight ago regarding circular and oval pictures. Whoever the authority may be to whom he refers, he can scarcely have had much experience with photographic negatives, especially in reproducing them for the lantern, or, if he has had the experience, must be singularly fortunate, not to say skilful, in his original selection of subjects, or else wonderfully careless of their final appearance.

It is all very well to preach about what painters do or do not. The case is certainly not on all fours with that of the photographer. The latter is compelled to take his subject as it is presented to him, and, while undoubtedly a great deal depends upon the selection of point of view, it is in sadly too many instances impossible to eliminate obnoxious portions of the picture, except by the device of departing from the conventional rectangular shape. The painter can, on the contrary, leave out or introduce what he likes, and, if he so please, "idealise" his picture out of all recognition or resemblance to the original. If the painter, then, as he undoubtedly does, often resorts to circular, oval, and other shapes, surely the photographer may quite legitimately follow his example.

If any one will take the trouble to carefully examine a collection of landscape negatives—say, a few dozen—of fair average or good quality, so far as selection and composition go, he will probably be

surprised how few of them are not capable of improvement by the removal of some portion of their length and breadth. I speak now only of negatives taken upon plates of the conventional sizes, in which the height and breadth vary very materially, and in taking which the subject has been specially arranged as far as possible to suit the shapes and dimensions of the plate at the time of taking; but, if the examination be further extended, and the subjects adapted to the requirements of the lantern slide, it will be found that a large majority of them will not bear curtailment in breadth to bring them within the square form of plate unless they are at the same time converted to the circular or oval shape.

The square form of picture probably lends itself less readily to the production of artistic results than any other, not omitting even —Mr. Maclean's "authority" notwithstanding—the circular and oval. The rectangle, whose horizontal and vertical dimensions differ considerably, is, no doubt, the commonest form, and sometimes the longer dimension is in one direction, sometimes the other, but the square is seldom met with even in photographs of paintings. The photographer, therefore, who in taking his negatives has to conform to the conventional rules regarding shape, finds himself considerably handicapped when his composition has to be brought within the bounds of the square lantern plate.

It is little wonder, under the circumstances, that cushion, dome, circular, and oval shapes should be resorted to in the attempt to keep up a semblance of pictorial composition; and, though there is, perhaps, not much to be said in defence of the two first as distinguished from the real square, it can scarcely be denied that the circle and oval do, undoubtedly, often lend themselves not only to the production of artistic results, but to the actual improvement of existing compositions. If such is not the case, it is truly wonderful that some of the best and most artistic of our photographers have continued to err in that direction without the discovery having been made until now.

I do not imagine that I am single in my method of working in the production of lantern slides from negatives of such sizes and shapes as half-plate or $7\frac{1}{2} \times 5$; in fact, I know I am not. I have a series of masks of cardboard of the outward dimensions of the negative, and having apertures of circular, oval, and other shapes of the largest measurement the cardboard will bear. For instance, the circle is of a diameter a quarter or three-eighths of an inch less than the narrower side of the negative, the shorter diameter of the oval being about the same as the circle, and the longer standing to it in the proportion of 9:7 or 7:5. Of the oval masks I use two or three of different proportions, and also occasionally rectangles of the same proportionate dimensions, the actual size being not very material.

These masks are used in much the same manner as an ordinary view meter in order to find what portion of the negative will yield the best general result when reduced to the dimensions of a lantern transparency. The negative under examination is held at arm's length in the left hand, while, in the right, one or other of the masks is held at different distances until the exact shape and dimensions of the useful portion of the negative are arrived at.

It is not necessary to have a large number of masks, though it is convenient to have at least two of each shape, but varying in size; but the actual form must be precisely that of the masks to be used in binding the slides. Thus, if an oval mask is used whose diameters are respectively two and three-quarter inches by two inches, a couple of examining masks may be used having apertures measuring $6\frac{1}{2} \times 4\frac{3}{4}$ and $5\frac{1}{2} \times 4$ respectively, or thereabouts. These will allow of a greater or less area of the original negative being chosen, and the final result is then a matter of more or less reduction to bring that portion of the subject within the boundary of the binding mask.

The same principle, of course, holds good whatever the shape of the binding masks that are to be used, the only care that is absolutely necessary is to see that the shape and dimensions of the "meter" are precisely proportionate. W. B. Bolton.

Professor Herkomer is said to use the phonograph for recording and repeating his lectures. The idea may be worth the attention of many of our lantern lecturers, who would like to ensure that their sets of slides when shown by strangers are properly and adequately described.

THE ELECTRIC LIGHT AND LIMELIGHT FOR LANTERN WORK.

At the present time, when, owing to the recent scare as to the dangers attending the employment of compressed gases for lantern work, the desirability of using the electric light in place of the limelight is being seriously considered, it may be of interest to compare the relative cost and advantages of the two lights, both as regards the capital expenditure and the working expenses necessary for each form of illumination.

In comparing the two lights, it is assumed that the most powerful jet is used with mixed gases for the limelight as against an electric arc lamp, giving a light equal to about double that of the oxy-hydrogen light.

Attempts have been made to adapt the incandescent form of electric lamp for lantern illumination. The most successful shape in which this has been done is by the incandescent lamp of 100 candle power, designed by Dr. Fleming, and manufactured by the Edison-Swan Company. This lamp, by over-running with a higher voltage than that for which it was intended, can be raised in power to about 150 candle power, though at the expense of a shorter existence; but even then the amount of illumination is only comparable with a good oil lamp, and the definition is not satisfactory, owing to the large area of the spiral of incandescent carbon forming the source of light. For parlour lantern displays it forms a very convenient illuminant where the current is available, but it cannot be compared with the limelight for effective work. The consumption of current is also somewhat extravagant for the light obtained as compared with the arc lamp.

When the arc light is used, the only limit for lantern purposes to the amount of illumination obtainable is the degree of heat given off by the arc. With a lamp giving from two to three times the amount of light available with the best form of limelight, a light is obtained which will not injure any ordinary lantern slide, and, with the simple forms of hand-fed lamps now on the market, the amount of knowledge required to work such lamps is very slight and easily acquired, whilst the steadiness and suitability of the light for projection purposes is acknowledged by all who have had the opportunity of practically testing it.

The principal—one might say the only—drawback to the adoption of the electric light is the difficulty of obtaining the necessary current. In London, and in many of the chief cities of the kingdom, this difficulty is being rapidly overcome by the establishment of central stations for the public supply of electricity, and the laying down of supply mains in the principal thoroughfares from which current can be obtained with the same ease as from the gas mains. Most of our public halls and institutions are now wired for the electric light, and the number of private houses similarly fitted is increasing rapidly every year.

At present the only advantage the limelight possesses over the electric light is its portability, the invention of cylinders and compressed gases enabling the lantern operator to carry with him all that is necessary to produce the light, and making it possible for him to give his displays in almost any situation.

This is, doubtless, a great advantage, but at the present rate of progress of electric lighting the facility for obtaining current will soon be such that the general adoption of the electric arc light for the lantern in place of the limelight may be confidently anticipated in the near future.

In the following comparison between the cost of the apparatus necessary for the two lights, the charges given are for ordinary plain but sound appliances, such as may be obtained from any firm of good standing, and as quoted in their price lists.

It is assumed in the calculations that similar lanterns are employed in either case, the arc lamps now available being arranged to fit lanterns already designed for the limelight.

Limelight for a Single Lantern.	£	s.	d.
Jet	2	2	0
Two twenty-feet cylinders	4	4	0
Two Beard regulators	3	0	0
Gas tubing	0	5	0
	£9	11	0

If a second lantern were required, with dissolver, then the extra cost would be—

	£	s.	d.
Jet	2	2	0
Dissolver	1	1	0
	£3	3	0

or a total expenditure of 12*l.* 14*s.*

The cost of a pressure gauge is not included, though in most cases this would be a very necessary addition.

ARC LIGHT FOR SINGLE LANTERN.

	£	s.	d.
Hand-fed arc lamp	4	4	0
Resistance frame and switch	3	3	0
Connecting wires	0	10	0
	£7	17	0

For a biunial lantern the whole of the above charges would have to be doubled, making a total cost of 15*l.* 14*s.*

To this might have to be added the cost of branch wires and terminals from the house mains, assuming that the building is already fitted for electric lighting. It is not proposed that a branch should be specially "laid on" from the street mains for lantern purposes only, as this would, in most cases, make the cost prohibitive for all but public halls.

The working expenses per hour for the two lights may be reckoned as follows:—

LIMELIGHT.

	s.	d.
4 feet of oxygen at 3*d.* per foot	1	0
6 feet of coal gas at 3*d.* per foot	1	6
Lime		1
Waste gas (unused in cylinders but paid for) say		3
	2	10

ELECTRIC ARC LIGHT.

(Current at 7*d.* per unit of 1000 watts.)	d.
750 watts	5½
Carbon	1½
	7

From the above statement it will be seen that the prime cost of apparatus for a single lantern is about 2*l.* less, and for a double lantern about 3*l.* more, when the electric light is employed, than the cost of limelight apparatus. The working expenses are largely in favour of the electric light, the cost of the latter being about one-fifth that of the mixed gases, whilst there are the further advantages of better illumination, a purer light, the knowledge that the current is always on, and the absence of all worry over full or empty cylinders and the expense of carriage for same in refilling.

It is evident from the above that, where the electric current is available, the adoption of the arc lamp for lantern work is to be recommended, both on the score of economy and efficiency as well as from minor considerations. GEORGE DAVENPORT.

PROJECTED PORTRAITS.

IX.—MR. GEORGE DAVISON.

PROFESSIONALLY, I believe, Mr. Davison holds office in a Government department; but anybody having personal intercourse with him would need the most solemn assurance of the fact, inasmuch as, unlike ninety-nine per cent. of Civil Service officials, his demeanour has nothing of the despot or autocrat in it. Early in the career of the Camera Club, he became its Honorary Secretary, and has achieved the Herculean feat of sticking to his post in the face of what rumour has hinted have been peculiar difficulties. He has recently resigned, and must be gratified to know that the gossips and the quidnuncs are shaking their heads over the future of the superior institution in Charing Cross-road, W.C., which is comforting to Mr. Davison's successor. Mr. Davison is one of the foremost exponents of the Diffused Treatment School of Photography, which he has worked hard to popularise with a fluent pen and a persuasive voice. His own pictures are marvels of up-to-date photographic art in the way of breadth of effect which nobody but a few intoxicated adherents of the New Movement can understand or appreciate. But what of that? Did not the illustrious James A. MacNeil Whistler's chaotic daubs languish in the cold shade of contemptuous neglect for many years? and now, none are so poor as not to honour them at many golden sovereigns per square inch. So, who knows but that, in the dim and distant future, original "Davisons" may not provoke a buzz of competitive excitement among millionaires at Christie's? Mr. Davison seceded from the Photographic Society of Great Britain at the time of the famous row about the hanging. He is a Director of the Eastman Photographic Materials Company.

X.—MR. BIRT ACRES.

On the wrappings of one of Messrs. W. D. & H. O. Wills's packet tobaccos, the late Mr. W. M. Thackeray is quoted as saying that "there is no better tobacco comes from Old Virginia than the Three Castles." Mr. Birt Acres comes, I have been told, from Virginia, and has a unique personality *sui generis*. He possesses very great skill in certain branches of photography that have an almost poetic flavour, thus affording a clue to the real nature of Mr. Acres' character, which, for lack of such evidence, most of us would regard as eminently practical and unsentimental. His favourite occupation is, or was, to photograph the melancholy ocean in its turbulent moods. It is impossible to describe the emotional effect which vast carbon enlargements of his marine studies, with appropriate poetry by way of title, produce in one's soul. *Poeta nascitur, non fit.* Then, Mr. Acres is of a soaring tendency, and frequently points his camera to the clouds, in which he discovers and photographs a world of new beauty. He is of opinion that amateur photographers could not do better than turn their [photographic] attention heavenwards. The splendid example he has set them should distinctly raise the status of amateur photography in more ways than one. Mr. Acres is general manager of the go-ahead firm of Messrs. Elliott & Son, Barnet. He is said to have been the founder of the defunct Photographic Dealers and Manufacturers Association. In the recent revivification of the carbon process he has taken a great part, and in many branches of photography other than those I have named he displays much inventive ingenuity.

XI.—CAPTAIN ABNEY.

After his name Captain Abney is entitled to write C.B., R.E., F.R.S.' D.C.L., F.C.S., P.R.A.S., and other initials too numerous to specify. Notwithstanding this appalling weight of scientific honorification, Captain Abney appears to be in good health. He gave up the Presidency of the Photographic Society of Great Russell-street—I mean Great Britain [You *wrote* Great Russell-street.—*Printer*]—a couple of months ago, but retains that of the Camera Club. Ever since his earlier days at Chatham, now more than quarter of a century ago, he has passed much time in experimental work in photographic chemistry, and the results of his labours are embodied in numerous treatises, communications to societies, lectures, and so forth, the whole of which probably he himself alone has read. Plate-makers are indebted to him for pointing out the uses of iodide in emulsions. In the chemistry and physics of photography he is looked up to as a masterful authority; but the extraordinary thing is that, despite his great acquirements in general scientific and photographic theory, his powers as a practical photographer are really notable, his recent Alpine pictures and lantern slides proving him to have an unsurpassed degree of practical skill in these branches of photography. This is such a phenomenal and eccentric inversion of the ordinary law that your theorist is, or should be, quite innocent of practical ability, that it deserves to be placed on record. Captain Abney occupies an important post in the Department of Science and Art at South Kensington, and is probably destined for higher honours. There is nothing at all of the dry-as-dust about him personally, and, as chairman of a meeting, or president of a society, he is a model of tact and *bonhomie*. His speeches read better than they sound, and he cherishes an affectionate devotion to the pipe of peace. He is fond of twitting artists with the scientific falsity of their pictures, and is severe on the diffused treatment (or fuzzy) school of photographers. In the latter respect he may be congratulated on the accomplishment of a great deed—he has touched pitch and remained undefiled.

XII.—MR. THOMAS FALL.

Mr. Fall is usually considered a portrait photographer who has met with success in the doubly agreeable sense of producing high-class work with the not unpleasant sequel of finding it profitable. Like most Yorkshiremen, Mr. Fall is fond of animals, and his dog pictures credit him with marked ability as a canine photographer. He is of an anecdotal turn of mind and is always telling stories—good and amusing ones, of course, not those that bad little boys are prone to give way to. Mr. Fall, unlike many of his big *confrères* at the West End, takes great interest in the condition of his poorer and weaker brethren in the profession. He is a good supporter of the Benevolent Fund, and he is President of the National Association of Professional Photographers, to which he chivalrously gives a lot of his time and attention, in the hope of ultimately conferring some tangible benefits on the profession at large. We all wish you luck, Mr. Fall. I shall not readily forget a withering attack on amateurs in general which Mr. Fall once delivered in my hearing. It was at a mixed gathering, and the amateur element was apparently preponderant. Mr. Fall went for the foe in truly heroic style, but somehow, before that meeting was over, he discovered that

the amateur photographer was not quite so black as he was painted and was ordinarily quite a mild and harmless biped, so "he remained to bless," as the saying is. Since then, Mr. Fall has extended his most distinguished consideration to amateurs in general. In every sense he is an admirable representative of his profession, and the pity of it is that there are not more like him in it. LIMELIGHT.

(*To be continued.*)

STEREOSCOPIC PROJECTION WITH POLARISED LIGHT.

THE difficulties which are encountered in the endeavour to secure stereoscopic projection which shall be visible to a number of persons at once, are both numerous and formidable. The use of Nicols in the lanterns and eyepieces is prohibited by the first cost, which would be something very considerable indeed, and tourmalines, artificial or otherwise, are equally out of the question, and the choice, for analysers at any rate, if not for polarisers, is confined to a bundle of glass plates.

The eyepieces in Mr. Anderton's instrument are composed of a number of discs of the thin glass used by microscopists, and the transmitted beam is that which is employed. This is open at first sight to the objection that a considerable amount of the light which reaches the eye is not polarised, but in practice it would appear that this, while not interfering in any way with the stereoscopic effect, adds to the general brightness of the picture; at least, this was the impression it gave me on comparing the images received with the Anderton eyepiece against the same viewed with a couple of Nicols. The use of the bundles of glass enables the eyepieces to be of a very light construction, but they might be still further lightened and the polarisation increased could tourmaline plates be employed.

An improvement, it has struck me very forcibly, would be the polarisation of the light, either by reflection or otherwise, before it falls upon the slide. The glass plates which intervene between the lantern objectives and the screen seem to interfere very considerably with the definition, as, indeed, could hardly help to be the case Possibly there may be difficulties of a practical nature which prevent such a course being adopted, but I certainly think it worth trying.

The screen, again, must be a source of trouble, and can hardly fail to be one so long as it has to be of a portable nature. The most noticeable thing in an exhibition of the lantern stereoscope is the irregular surface of the silver foil which covers it. This is readily accounted for, when it is borne in mind that we have a double film united together, of the most dissimilar materials, a metal and a fabric. We all know how sensitive to every change of temperature a spring composed of two metals can be made, and here we have in close contact a metal which is practically unalterable, and a material the dimensions of which must alter very considerably with every variation in the humidity of the atmosphere in which it happens to be. Of course, an ideal screen for the lantern would be either one composed wholly of a large metal sheet, which, I fear, is too good to hope for, or a rigid wall upon which the foil could be mounted. The amount of light reflected by the metallic screen is so greatly in excess of that coming from the usual form of white sheet, or even of whitewashed wall, that, were its metallic lustre but a little less in evidence, and the above-mentioned difficulty surmounted, it would seem to be of service with the ordinary lantern. As it is, with the loss of light which must necessarily occur in the passage of the beam through both polariser and analyser, it must be of additional service, by reason of the larger proportion which it reflects of the light falling upon it.

As a means of exhibiting some of the most striking phenomena of polarised light, the lantern stereoscope stands, I think, unrivalled. It will be remembered by those of my readers who saw it in London last autumn that the exhibitors were in the habit of projecting at the outset two entirely different pictures, either of which could be seen by looking with one eye through one or other of the analysers, and the applause with which this experiment was received upon the occasion on which I was present seemed to indicate that it was one of an almost startlingly novel character. It is but one of a great number of surprising and instructive experiments, most of which could be better performed with the biunial lantern and polarisers than with the ordinary lantern polariscope, if, indeed, many of them could be performed with this latter instrument at all; although, on the other hand, there are, of course, many for which the lantern stereoscope is not suitable.

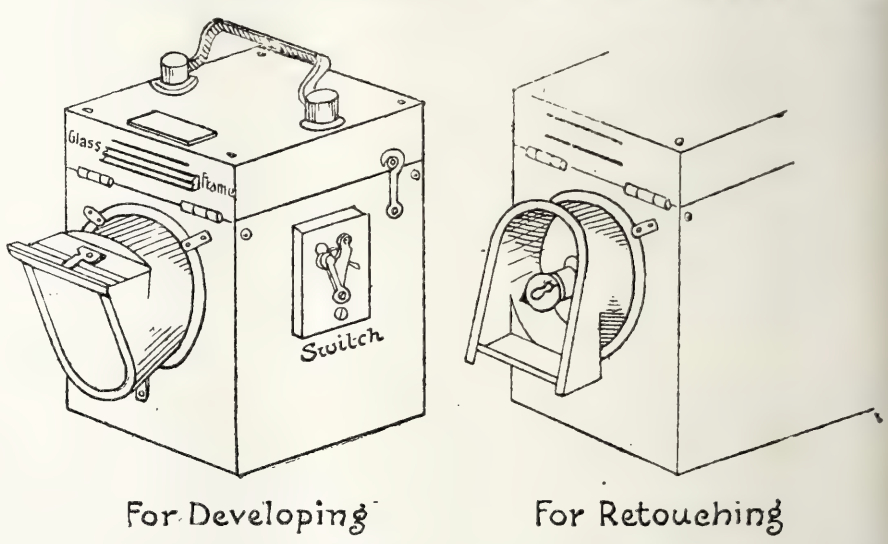
The experiment mentioned above indicated also that, although, as I have previously mentioned, the light reaching the eyes and forming the image was not completely polarised, the quantity of ordinary light transmitted being readily seen by looking at a light through two of the analysers crossed, and being considerable in amount, still the polarisation was sufficiently complete to render the other picture on the screen, when viewing one only with one of the eyepieces, practically invisible. The second image, if care were taken to hold the analyser perfectly horizontal, could only be just seen if carefully looked for, and then only in those parts where some portions of it contrasted very strongly with that part of the other upon which it happened to fall. From this it would seem that complete polarisation is far from necessary to secure a successful result.

A remarkable feature of the lantern stereoscope is the following, and its cause has still to be stated. With an ordinary stereoscopic view, examined in a stereoscope, it is well known that the actual size of the prints or transparencies is lost sight of, the image appearing realistic in dimensions as well as relief. The projected images, on the other hand, at least to me, appear to be actually reduced in size when looked at through the analysers, in fact, the effect is exactly the reverse of that yielded by the common stereoscope. This is to some extent, no doubt, a drawback to the popularity of the instrument; still, the ingenuity with which the many difficulties have been met, and to a very large extent overcome, can only be considered to merit the highest praise. JAMES LEWIS.

THE "ALLUSES" PHOTO-ELECTRIC LAMP.

Hurst & Co., 6, Fowkes-buildings, Great Tower-street, E.C.

THIS electric lamp, which is due to the introduction of Mr. Redmond Barrett, was exhibited and explained by him in the course of his lecture on *Retouching*, at the Central Photographic Club, on Friday, March 30. It can be used for retouching for which it appears to give a powerful and effective light as well as for developing or reading, bromide printing, lantern-slide making, for all of which purposes it is easily adapted.



It is thoroughly free from all the unpleasant features which usually accompany the use of oil or candle lamps. There is absolutely no smell, as is natural to combustion in the latter forms of lamp. Thus the atmospheric conditions are such as to render long hours of work less exhausting and injurious to health than they would be under existing conditions.

If desired, incandescent lamps of higher candle power can be adapted, thus enabling the lamp to be used for general lighting purposes. The accumulator is of such capacity as to light the lamp for twenty consecutive hours if desired, but it is best to have it recharged (the cost for same is a mere trifle) as soon as the light shows signs of decreasing brightness.

The size of the "Alluses" is 7¾ in. high, about 5¼ in. top and bottom. The "Alluses" is highly finished with nickel fittings, and is well and elegantly made. It should, and doubtless will, be popular and useful for the various purposes for which it is intended.

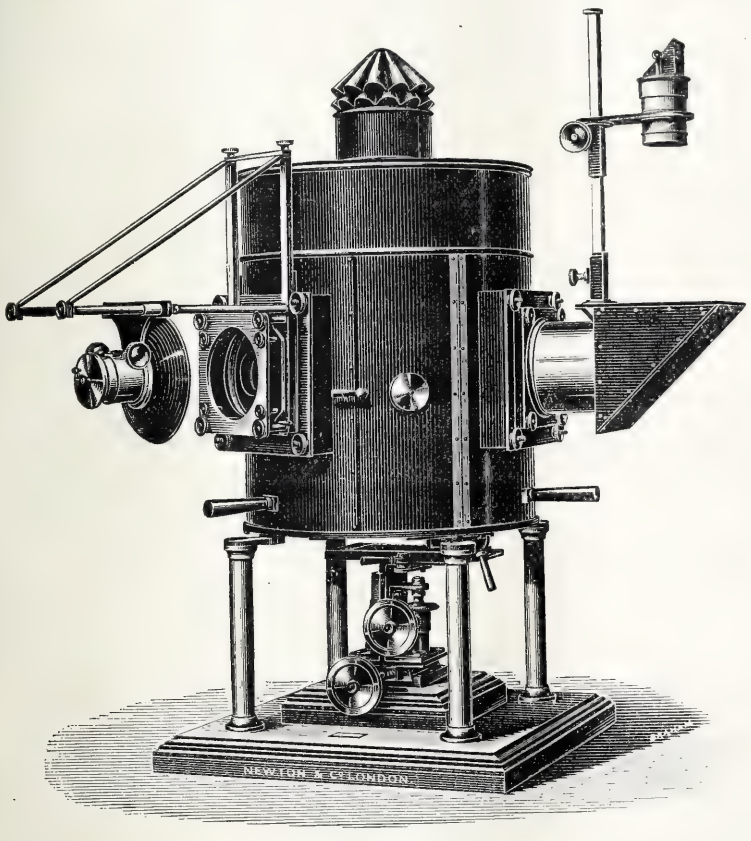
THE ROYAL SOCIETY'S NEW LANTERN.

A NEW lantern has just been made for use at the Royal Society's rooms at Burlington House, to take the place of the old one that has done duty there for some time past. Considerable trouble was taken over the matter in order to obtain the best and most convenient form of lantern, with the result that the instrument figured below is now being used at the Society's meetings.

The lantern has been constructed by Messrs. Newton & Co., of 3 Fleet-street, the form selected being their triple rotating lantern, fitted with a Brockie-Pell arc lamp, mounted on a gun-metal traversing table, with screw movements for centering the light, and, for what is still more requisite, keeping it centered.

However good the focus-keeping arrangements of a lamp may be, the carbons cannot be depended on for perfect homogeneity, and a slight variation in the hardness of either of them will cause sufficient deviation of the arc to bring a trace of red or blue on one edge of the disc, which is sufficient to spoil the effect of many experiments, but which can be instantly got rid of by a turn of one of the milled heads of the traversing table.

The body of the lantern is made entirely of bronzed brass, and can be rotated so as to bring each of the three fronts in succession opposite the fixed arc light. As will be seen from the woodcut, one of these fronts is fitted with a front lens suspended in the manner devised by Sir David Salomons for exhibiting either slides or apparatus on the screen—a very simple and convenient arrangement; while the second front carries a



vertical attachment, for projecting any transparent or partially transparent object which can only be laid horizontally, such as iron filings to show the lines of force of a magnet, or Plateau's experiment illustrating Saturn's rings, &c. Another very convenient method of using this attachment is by placing on the horizontal stage an ordinary sheet of smoked glass, and writing or drawing on this with a stylus, so that the lines are projected on to the screen as they are being made, obviously a far preferable way of making a diagram to the usual method of projecting it ready-made from a slide.

The condensing lens of this attachment is five inches in diameter, and the prism is of such size as to project the whole of it on the screen, so that a drawing may be made of any size up to five inches in diameter.

The third front, which is not shown in the figure, carries a four-and-a-half-inch parallel beam condenser, with slit front having screw motions, and a rotating diaphragm. All the fronts are interchangeable, and are so arranged that microscopes, polariscopes, or similar instruments, can be bolted on at will.

In these days, when goods "made in Germany" seem to be in many instances pushing English work out of the market, it is satisfactory and pleasant to notice that in many instances the higher class of English work more than holds its own. Such instruments as theodolites and levels, as manufactured by two or three of our best firms, hold the lead both here and abroad, and in lantern work, particularly lanterns of a scientific kind, England is certainly *facile princeps*. Lanterns of a form similar to that we have just described have been recently supplied by the same firm to several of the universities and colleges in the United States, Canada, and on the Continent, and it would probably be difficult to find a university of any standing abroad which does not possess English apparatus of projection of some sort or other.

This form of electric lantern is also in use at the Royal Institution and at the Royal Dublin Society, as well as at the Universities of Oxford, Cambridge, Glasgow, and Dublin, and one is now being constructed by order of the War Office for the School of Electric Engineering at Chatham.

A LANTERN TALK ON MEDICAL PHOTOGRAPHY.

ON February 13, Dr. Edward Leaming gave *A Lantern Talk on Medical Photography*, before the Society of Amateur Photographers of New York.

Dr. Leaming having exhibited and described a small vertical camera of Ernst Leitz, of Wetzlar, for photo-micrography and the Edinger projection apparatus as improved by Leitz for photographing entire microscopical sections with low-power objectives, said:—

"I have thought it best this evening to make a lantern talk of the subject, and, instead of holding you at arm's length with a formal paper, to describe the slides to you as they are thrown upon the screen in an entirely informal manner.

"Medical Photography, of course, deals entirely with the scientific side of photography, and simply records facts, the element of æsthetic beauty not entering into consideration. The first slides that I shall show you illustrate the latest facts in regard to a hitherto very imperfectly understood disease, myxœdema. The knowledge of the cause of the disease and its proper treatment are directly due to vivisection. This knowledge was acquired only last year from experiments by Horsley and Murray in England upon monkeys. They found that these animals when deprived of the thyroid gland exhibited all the symptoms of myxœdema as seen in the human subject. It was reasoned then that this disease in the human subject must be due to an atrophy or loss of function of the thyroid gland, and that, if it were possible to supply persons suffering in this way with thyroid gland, or an extract of the thyroid, it would be possible to stop the progress of the disease. This was done, and with perfect success.

"Here is a photograph of a patient suffering from the disease as she presented herself at Dr. Starr's clinic in March 1893; it and the following pictures were taken by Dr. Henry Power, an assistant of Dr. Starr at that time. You see plainly all the characteristics of the disease—the œdema or swelling— also the arching of the eyebrows and the numerous fine lines and wrinkles in the forehead and face, also the heavy animal expression of countenance. The next picture was taken in May, she having been under the treatment that I have just outlined to you—you see at once what an improvement has taken place—and this third picture I took in October, which was the first time I saw her. She looks a well woman here, all the œdema is gone, her expression is bright and natural; and now, if we again compare her picture when she first came for treatment with the last, you will be impressed with the difference. No possible method of lighting would produce such a difference in the human countenance as you see here depicted—you would scarcely recognise them as being pictures of the same woman.

"In surgery, photography is constantly used as a record of operations and of appearances before and after operations. I have not thought it necessary to show you any such.

"We now come to the use of photography by the pathologist. The slides that follow are used by Professor Starr in his lectures to the students at the College of Physicians and Surgeons, and illustrate some of the tumours in the brain. When we have a brain or other tissue preserved in alcohol, it remains white—in fact, the alcohol has a bleaching action, and still further whitens the specimen; they are very easy to photograph. When, however, as is frequently the case, a brain is preserved in a solution of bichromate of potash or Müller's fluid, it is first yellow, then becomes brown, and finally of an olive green. In the yellow or brown stage they are hard to photograph, being very non-actinic, but in the green stage they present no difficulties."

There were then thrown on the screen slides from pathological specimens preserved in alcohol, and others preserved in bichromate of potash, and the manner of preparing them and photographing them was pointed out.

To illustrate the application of photography to anthropology, photographs of the skulls of some of the North American races—a Sioux Indian, a Huron from the Province of Quebec, a native Mexican, and a Flat Head Indian from Columbia River—were shown. The slides ex-

hibited were only a few of an extended series that Dr. Leaming is taking for Dr. Huntington, Professor of Anatomy at the College of Physicians and Surgeons.

Dr. Leaming continued: "What I have previously shown you may be classed as routine work not differing essentially from ordinary photographic work. We now come to magnification of microscopical objects. With the lowest powers, where you wish to magnify an entire microscopical slide or section, there are two methods that can be used, namely, that by reversed foci, and the small projection apparatus of Edinger that I have shown you. Here a section of growing bone taken by the first of these methods I used a seven-inch lens on the front of a long copying camera, the microscopical slide being placed in a frame in front of the camera, the focussing being done by moving the whole camera bodily. This, of course, is inconvenient, and it is much better to use the second of the two methods." A few microscopical objects taken by the Edinger projection apparatus were then thrown on the screen.

Before showing slides made with the higher powers, the various forms of apparatus and methods of working used by microscopists were illustrated on the screen. First, what is known as Woodward's installation. This was the method used by Surgeon-General Woodward in the Army Medical Museum in Washington. He used the entire room, as his camera; the heliostat, being placed outside the window on a shelf, and the sunlight, thrown through a hole in a shutter, passing through the microscope, proper colour screens being placed in the path of the rays, the image is projected upon the screen, which is held in a carriage running on rails or ways to and from the microscope, and in its optical axis. Dr. Woodward worked entirely with wet plates, and some of his work is unexcelled at the present day. Some still prefer to work in this manner, but most micrographers now use some one of the different forms of apparatus shown in the slides which followed, comprising photographs of microscopical apparatus made by Nachet of Paris, Carl Reichert of Vienna, Carl Zeiss of Jena—which is one of the most complicated and expensive made, but is very precise—Leitz of Wetzlar, and Watson and Swift of London, that of Watson being made for Dr. Henri Van Heurck, of Antwerp, and that of Swift being used by Andrew Pringle. Mr. Pringle prefers to use the oxy-hydrogen light. A diagram of the lens that is used for high-power work—namely, the apochromat of Zeiss—was then shown. The front lens is hyper-hemispherical in form; behind that is another plano-concave cemented to a concavo-convex—these are the ones that magnify the image; directly behind these is a triplet that has no magnifying power, but serves to correct the spherical aberration. Still further back is another triplet without magnifying power, that corrects the chromatic aberration; the image is taken up and projected by the projection ocular.

The different methods and implements used having been shown, there were exhibited some of the photographs themselves, among them some beautifully cut and stained sections illustrating vegetable histology made by Dr. Skeel, a member of the Society—a longitudinal and cross section of corn-stalk, section of mullen (*Verbascum thapsus*), sunflower (*Helianthus*) and bud of the day lily, head of tænia, section of lung injected with celloidine, section of lung showing divisions into lobules, blood crystals.

"I wish now to show you one of the recent achievements in staining of nerve cells and fibres; it is known as Golgi's stain, and was published by Golgi, an Italian, some years ago, but did not attract much attention. It was taken up by a Spaniard and written about, and is now being used everywhere. I was taught, when a student, that what is known as the axis cylinder of a nerve cell went directly to its destination without branching in any way. Golgi's stain shows that this is not so, but that the axis cylinder process has numerous fine branches called collaterals. The other branches of the nerve cell are also brought out in a most striking manner. The stain brings these out a dense black upon a brownish yellow ground. It is a metallic impregnation stain, composed of bichromate of potash and osmic acid followed by nitrate of silver. It may be interesting to you to see an actual section of tissue injected and stained, as it will give you a very good idea of what has actually to be photographed—these are precisely like microscophical slides except that they are much larger and thicker. They are mounted in balsam and are loaned by Prof. Delafield to show you to-night. They are from a series of similar ones that he uses for teaching by lantern projection; the first is a section of lung injected with blue and stained red, the next is a section at the neck, showing the thyroid gland, trachea, and œsophagus."

Coming to the study of bacteria, as shown by the camera, a slide was exhibited displaying the method of cultivation known as plating. A Petrie plate, a shallow glass dish with cover, in which is poured a sterilised solution of gelatine or agar agar, a Japanese seaweed, is exposed to the air, and the slide made from it showed colonies of bacteria of different kinds growing all over the surface. If it is desired to study one kind of bacteria alone, a single colony, or portion of a colony, is picked up from the plate by means of a sterilised platinum wire, and put in a tube of sterilised gelatine or agar, such as was seen in the next photograph, which showed two cultures in gelatine, both of them cholera asiatica.

There was next shown a slide of the test diatom, known as the pleurosigma angulatum, taken precisely the same as bacteria are taken, that is, with full opening of the condenser, and at a magnification of a thousand diameters, and following this came slides of the plasucodium malariæ and of some bacteria, anthrax liver smear of mouse, sarcina, blue stain, Kleb's Loeffler, or bacillus of diphtheria, blue stain, bacillus typhosus stained for flagella, pneumococcus encapsulated, the specimens being stained red or blue.

"The blue photographs to the least advantage, no matter what colour screen you use, the red is much easier to take, but I have been looking for a better stain for photographic purposes for some time, and have found what I think is the best bacterial stain for such work that I have ever seen. It is known as Haidenhain's tissue stain. I have made some slight modifications in applying it to bacteria. It gives a dark purplish black upon a perfectly clear ground, and brings out the micro-organisms very sharply stained, as the following slides will show you. They photograph with very great sharpness and detail."

Then came slides of the spirillum rubrum, tetanus, a guinea pig inoculated with tetanus, bacillus subtilis, streptococcus of erysipelas, and bacillus tuberculosis in sputum, the last being a double stain.

The last slide shown, that of the lung of a rabbit, exhibited the first production of phthisis in the lower animals, and was the result of the inoculation of a rabbit first with bacillus tuberculosis, and then with other micro-organisms. The experiment was performed by Dr. T. M. Prudden, and goes to prove that phthisis in man is due to something more than infection by the bacillus tuberculosis alone, a discovery in every way as important and significant as that of Professor Koch.

THE WORLD'S FAIR SLIDES ON THE SCREEN.

The Philadelphia Society's collection of World's Fair slides were shown in Boston on Saturday evening, February 17, under the auspices of the Boston Camera Club. Judging from the newspaper notices, the audience was large and appreciative. The Boston *Herald* spoke of the slides as "one of the finest, if not the finest set, of World's Fair stereopticon views in existence," and the *Transcript* said they "were certainly remarkably fine," adding that "nothing could have been calculated to give such a complete and striking idea of the World's Fair to any one who had not seen it."

The *Transcript* says: "It was generally understood that something a little uncommon in the line of photographic views was to be expected, as the collection shown was selected from about 1500 lantern slides submitted by the members of the Philadelphia Society; and in this anticipation no one who attended the lecture was disappointed, for the views of the fair were certainly remarkably fine. So many were shown that it took nearly an hour and three-quarters to exhibit the whole series, yet every one in the hall stared with all possible intentness every moment of the time, and was transported in imagination to the lagoons and avenues of the White City, which never looked more majestic or more beautiful.

The series of pictures began with a view of the more conspicuous of the State buildings, such as those of Massachusetts, Pennsylvania, New York, California, Illinois, Missouri, &c. Virginia should have been included in this series. The lecturer gave a good hard thrust at the Illinois Building, which was applauded, but he seemed to think the Missouri Building a perfect masterpiece of architecture. A number of the houses erected by the foreign commissions were pictured, such as the Victoria House, the German and Swedish Buildings, &c. Then the various huge Exhibition buildings were seen, one after another, in due order, until the old traveller began to experience "that tired feeling" so familiar to all the visitors to the Fair. Rounds of hearty applause greeted the superb views of the Court of Honour, the Peristyle, the Mac-Monnies Fountain, the Colonnade, the Agricultural Building, the Machinery Hall, and the Art Palace. Demonstrations of pleasure were also made when the pictures of the Liberty Bell, the Columbus Statue, the Caravels, the Fishery Building, and the statue of the Indian Scout were thrown upon the screen. Then came an excursion into the Midway, a little too prolonged, perhaps, by a sojourn in the Cairo Street, with shorter visits to the Irish Village, the Dahomeyans, the Javanese, Old Vienna, and the Ferris Wheel. Finally, the imposing pageant came to an end with a night illumination of the fountains in the Court of Honour, and the show closed in a blaze of glory. There was one evening view of the MacMonnies Fountain, with the electric light thrown upon it—the dome of the Administration Building with its lines of lights looming in the background.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*May* 4, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

It will be remembered that, when the scare that followed upon the lamentable accident at Bradford was at its height, it was suggested by several that greater safety would be ensured if the compressors would materially reduce the pressure at which the gas cylinders were usually filled. Mr. Murray, the Manager of Brin's Oxygen Company, recently informed us that very few applications were received by his Company for reduced pressure, and, so far as he could gather, the general body of lanternists were not at all alarmed at the filling pressure of the cylinders. Mr. Murray, however, told us that if there was a decided preference among the users of gas cylinders for a reduction in pressure—that is to say, if sixty per cent. of the users were in favour of a reduction—his Company would fill accordingly. This strikes us as an eminently reasonable position to take up, especially in view of the circumstance that, so far, no evidence has been met with condemnatory of 120 atmospheres being too high a pressure.

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Mr. Charles H. Oakden is showing before the Societies a series of lantern slides from the late O. G. Rejlander's negatives. Young photographers can pick up many a hint in the study and posing of the human figure from these examples of Rejlander's art. They can also do something to help somebody else besides, that is, they can purchase prints or enlargements from the negatives alluded to, by doing which Mrs. Rejlander will secure the benefit of the printing.

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Messrs. J. B. Colt & Co., of Beekman-street, New York, have sent us Supplement No. 9 to their Catalogue. We note that this contains illustrated particulars of several hand-feed electrical lanterns, as well as other projection apparatus.

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The birthday of the Princess Beatrice was marked by a novel departure at Windsor. A lantern screen was hung in the proscenium of the bijou theatre created in the Waterloo Chamber, and an amusing entertainment was given in the early evening for the benefit of the children of the Princess Beatrice. The place in what may be called the stalls that is usually occupied by the Queen was appropriated by the Princess Ena. This is the first time that the Queen's theatre has been adapted to the requirements of the grandchildren. Lantern entertainments are no novelty with them, but they have hitherto been given in a less sumptuous environment.

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A large and very powerful search light is, we hear, about to be located at Sandy Hook for the purpose of experimenting upon the practical usage of the light in coast defence. The idea of these suggestions emanated from the operation of the big lights at the Exposition. General Flagler, Chief of Ordnance, U.S.A., believes that, as these lights have been in such successful operation upon the men-of-war, they may be as successfully applied to service in coast defence. The apparatus required to carry out the projected experiments will cost altogether about 10,000 dollars.

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We extract the following from the report of a religious meeting; it will give those of our readers who do not take an active interest in the doings of religious bodies some idea of how useful and instructive the optical lantern is made to be in Church work:—"Dr. Guinness, previous to delivering his lecture, asked his audience to sing 'From Greenland's icy mountains,' the words of which were thrown upon the screen two lines at a time, and a brilliant and pleasing effect was given by charming pictures of 'icy mountains,' 'coral strands,' 'sunny fountains,' 'ancient rivers,' 'palmy plain,' and so forth; then 'English churchgoers,' 'Angels with trumpets,' 'Missionary ship in full sail,' 'Sea of glory,' 'Mount Calvary,' and 'Return of the Redeemer.' The missionary psalm (lxvii.) having been read, the map of the world was then thrown upon the screen (Mercator's projection), and the lecturer pointed out the great contrast between the known world in Christ's time and as it is known at the present day."

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Mr. R. R. Beard, of "Regulator" fame is shortly moving into new and larger premises.

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Some idea of the popularity of the lantern "up North" may be gleaned from the fact that when in Newcastle-on-Tyne recently Mr. John Watson of that town informed us that his stock of slides averaged 20,000. Mr. Watson's lantern business would appear to be an excellent one, judging from the capital stock of lantern goods that he keeps.

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On May 11, at the Central Photographic Club, Mr. W. Tylar, of Birmingham, will give a demonstration of the Hill-Norris dry-collodion plates, and will show results.

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The magnificent double lantern which Messrs. Watson & Son made for use at the Crystal Palace International Exhibition Lantern Shows last year was "put up" at Stevens's the other day, and, if really sold at the price at which it was knocked down (7*l.* 7*s.*), went remarkably cheap. It was said to have cost over 60*l.*

THE SAFETY OF GAS CYLINDERS.

ALTHOUGH this is a time of year when comparatively few cylinders are in use by lanternists, no diminution of interest can attach to any discussion which brings the subject of the safety of compressed gas cylinders into question. The Bradford accident, and the evidence adduced at the inquest that followed it, as well as the publication of Professor Goodman's report upon the nature and quality of the fatal cylinder, are, doubtless, still fresh in the minds of our readers. It will be recollected that the outcome of all this was a determination on the part of the principal compression companies to obviate the chances of accidents similar to that which occurred at Bradford by insisting on the reannealing of all cylinders sent to them to be recharged, which, with the precautions already taken in other directions, should have been, and doubtless was, sufficient to have a reassuring effect on lanternists and other users of cylinders.

The inconvenience to many caused by this wholesome, if drastic, action on the part of the companies has, we believe, been very great, and we gather that, although we are well into the slack season, it is by no means ended, for the companies—among which the Brin Company in particular is conspicuous—have since, in the interests of safety, been taking the somewhat vigorous course of refusing either to reanneal or refill many cylinders that have been sent to them, thus subjecting themselves to much severe criticism and comment in various directions.

The attitude of the Brin Company, immediately after the Bradford accident and since, must have struck the whole of the lantern world as dictated by a wise and prudent regard for the safety of cylinder-users, and we are quite sure that, in refusing to reanneal or recharge the cylinders alluded to, they are guided by the same important motive. We gather that the grounds upon which they have acted are that the class of cylinders in question were discovered after analysis to be formed of steel of a high tensile strength, having a large percentage of hardening material and a low elastic limit, apparently a material suitable for explosives, and not for sustaining gas under comparatively high pressure.

If we have been rightly informed on this matter, the Brin Company are entitled to the approval of the lantern world for declining to charge cylinders which they have good reason for believing are unsuitable for handling while holding gas under pressure. On the other hand, we sincerely hope that the cylinders we refer to, of which we believe a considerable number are extant, if of the dangerous nature described, will have been withdrawn from use, and placed beyond the possibility of being charged and sent out. The matter is one of such supreme gravity that we hope those more immediately interested will take the earliest opportunity of admitting the lantern public to a correct knowledge of the state of the case. For ourselves, we may say that we could scarcely conceive the possibility of people charging with gas steel vessels, the composition of which is analogous to that employed for explosive projectiles, until reading the paper (reproduced on another page) on *Hot Pressed Steel Cylinders for Holding Gases under High Pressure*, which Mr. Ashton Hand lately read before the Photographic Society of Philadelphia. Opinions may differ as to the merits of the process in question, but it must be apparent to all that a material suitable for projectiles is hardly the thing for cylinders, and Mr. Hand very naturally casts a doubt on the safety of such cylinders for compressed-gas purposes. We sincerely hope that cylinders of the nature indicated are not in use among lanternists either at home or abroad. The person who charged them with gas at a high pressure would deserve to be prosecuted. We believe, however, that the established gas companies are fully alive to this fact, and a comparison between Mr. Hand's remarks and the paper on gas cylinders by Mr. Murray which we published a short time ago, coupled with the recent action of the Brin Company, shows that the importance of a thoroughly ductile material for cylinders is already fully recognised in this country.

LANTERN MEMS.

THE interest taken in electric light for optical lantern purposes is steadily increasing as the distribution of electrical current becomes more general, and therefore, naturally, the series of four lectures just given by Professor J. A. Fleming, D.Sc., F.R.S., at the Royal Institution on *Electric Illumination*, have been well attended. The third one, on The Electric Arc Lamp, was the one that appealed most to the lanternist.

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AFTER describing the production of the electric light from incandescence lamps, and comparatively small light of a spark discharge as produced by friction, Professor Fleming proceeded to explain electric arc lamps as produced by a direct current of electricity and the composition of the light. This light, as is generally known, is produced by the contact of the two carbons and their after-separation to form the arc, for no matter how powerful the electric current may be no light is produced until actual contact is first made, the smallest amount of air space being sufficient to prevent the current passing from one carbon to the other. The positive carbon in which the crater is formed gives eighty per cent. of the light, and the other (or negative) only ten per cent., while the vapour in the arc is about five per cent. of the light emitted.

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IN lamps with the carbons placed vertically, and working on a direct current, a large proportion of the light is sent forward in a downward direction at an angle of about 40° from the horizontal, and, it is therefore necessary for optical projection, in order to utilise all the efficient rays possible, to place the carbons so that they slope backwards, and bring the best rays horizontal. The study of the electric arc was facilitated by projecting an image of the carbon points on the screen, and by means of a mirror in front of the lantern objective the rays (and, of course, image) were conveniently projected on to the screen, behind the lecturer, in such a position that all could see it. It was shown that the length of the arc and other measurements could readily be made on the screen of any part by taking the proportionate size in comparison with the carbons, the exact measurement of which could, of course, be easily first obtained.

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THE colour and composition of the arc and the spectra formed by different metals during vapourisation by the arc was readily shown, and made pretty experiments, while the temperature of the arc was stated, on the authority of Rosetti, to be 3200° Centigrade for the crater (positive carbon), and 2500° Centigrade for the negative.

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IN demonstrating the advisability of having diffused light for interiors, such as workshops, art galleries, or large rooms, and the value of the inverted arc for this purpose, one could not help being struck with the sense of comfort when no glaring light was visible to the eyes, for, by employing saucer-shaped white reflectors, and sending the light up to the ceiling or against white or other screens, all the light necessary for illumination of the objects in the room could be obtained.

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IT should be borne in mind (and this was emphasised at the lecture) that the effective light for general lighting purposes is that which reaches the eyes from the objects themselves, and not the rays that come direct to the eyes from the source of light. How often is the effective value of a light on the screen in lantern work neutralised by the eyes of the audience being temporarily distressed, if not paralysed, by the sudden turning up of brilliant electric or other lights in the hall.

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THIS is a point not sufficiently studied in some cases, but I could in no way find fault with the general arrangement of the light at the Royal Institution, for by judiciously lighting certain incandescence lamps around the lecture theatre, when everything was visible, and the contrast not too great when slides were shown on a bright disc.

A USEFUL safety conductor of electricity was shown in Woertz's lightning conductor, which was composed of small cylinders of brassy zinc that had been found to conduct to earth powerful electric currents from lightning flashes that would have destroyed or seriously injured any dynamos and machinery in the path of such currents. This small and simple instrument or arrangement is, no doubt, a great boon to electric-light engineers.

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WITH Edison and others working in the direction of the reproduction of movements, it should not be long before lanternists have in their power a means by which lifelike motions can be projected on the screen. The Kinetoscope of Edison, as far as I can understand, will, when placed on the market, be a visual instrument, and not suitable for lantern work; but an apparatus I had the privilege of seeing in course of construction some time since would, if successfully completed, be just the thing, for photographs could be taken in very rapid succession on ordinary quarter or lantern-size plates, or rather films, and, if reproduced on a transparent flexible substance, could, by a somewhat similar apparatus modified to receive the light necessary for transparencies to be projected on the screen.

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IT is a pity that Muybridge's beautiful and entertaining Zoopraxiscope, or some modification of it, has not yet found its way on the market and into the hands of lanternists. The Zoetrope is good as far as it goes, but its scope is so limited, and the loss of light such, that one feels some other means of quickly changing figures or designs is necessary.

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SOME interesting novelties are promised for the Royal Society's *Soirée* this week; but, as THE LANTERN RECORD will have gone to press before they are shown, the full description must stand over for a later mem. or separate article. One, however, may be mentioned, that is Mr. Eric Bruce's modified aerial graphoscope, wherein he uses a silvered mirror strip, instead of the ordinary wooden lathe, and produces some ghostlike illusions from strongly lighted objects placed in front of it while it is being rapidly revolved, also some curious effects of moving objects and chromatic discs projected on the revolving lathe. One, the well-known Newton's disc, which gives white light on being rapidly turned, and which can be shown, as that on a fixed screen, cannot be on the aerial screen produced by the revolving lathe, for it either shows each segment of colour or prismatic hues, according to the rapidity of revolution.

G. R. BAKER.

STRENGTH OF DEVELOPER AND THE COLOUR OF POSITIVE IMAGES.

IT is a well-known fact in connexion with the development of positives with ferrous oxalate that the more concentrated the solution the blacker will be the tone of the resulting image, and in proportion to the degree of dilution so will the colour change to a grey of more or less delicacy. This property, of course, gives a very considerable amount of control over the tones obtainable with negatives of widely varying character, even where the iron developer alone is employed; but, if we turn to some of the newer ones, the power is vastly increased, since these, besides acting far more energetically, differ very much in the vigour and nature of the image they produce.

Thus hydroquinone is remarkable for the extreme vigour or even heaviness of image that can be obtained by its means as well as for the richness of colour it produces, while metol is conspicuous for the delicacy of colour and gradation it gives, and, unlike hydroquinone, for the rapidity and energy of its action. Amidol takes place midway between the two, resembling metol more closely in its general characteristics of colour and action; it gives stronger and richer tones than the latter, but falls far short of hydroquinone when extreme vigour and contrast are required.

Bearing these properties in mind, it is comparatively easy to select a developer for any class of negative, to produce any desired result. For all-round purposes, perhaps, amidol may be taken as the typical and best developer, since, from an average negative, it is possible, by its means, to produce any character of tone, from pure black to light grey, with very little modification beyond simple dilution. Metol lends itself more to the production of greys or black of a neutral kind and less rich than either amidol or hydroquinone, and is specially serviceable in searching out detail in very dense negatives, either by contact printing or enlargement. Its energy enables it to penetrate the high lights, while its delicacy of image prevents the shadows from acquiring too great density or heaviness. For thin, delicate negatives, or those deficient in contrast, undoubtedly the best developer is hydroquinone, for its extremely vigorous action tends to magnify or exaggerate what little contrasts do already exist in the negative.

But, besides the power thus possessed in the use of these three developers separately, they can be mixed and used in combination with perfect safety, and often with real advantage. Indeed, it is possible to so combine them as to concentrate in one single solution the good qualities of all—the energy of metol with the richness of colour and vigour of amidol and hydroquinone. Such a mixture, moreover, exhibits perhaps more latitude in action than either of the agents separately—that is to say, it lends itself by mere dilution to any class of negative or almost any tone.

In mixing up such a solution, it is needful, of course, to have in view the general character of negatives with which the developer is to be used, and the kind of tones desired, and to fix the proportions of hydroquinone and metol or amidol, as the case may be, accordingly. It will not, as a rule, be necessary to combine all three in one solution, as a mixture of amidol or metol, with a sufficient proportion of hydroquinone, to confer the extra vigour required, will generally satisfy all requirements. One point alone deserves, however, to be borne in mind, namely, for positive purposes, to be rather sparing of the hydroquinone, as its tendency, especially with some papers, to run to density is so great that with average negatives it is difficult to avoid heaviness.

Perhaps for general work, or when much development printing is done, the best plan is to keep the three solutions separately made up to a definite strength, and to mix them as required and to suit any special circumstances. The separate solutions may be made up as "one-solution developers," ready for separate use, in which condition they keep perfectly well for a long time, except, perhaps, amidol; or they may be dissolved with sulphite of soda alone, and a separate standard solution of alkali be employed at the time of use. I prefer, myself, a concentrated one-solution compound developer, consisting of metol, hydroquinone, sulphite of soda, carbonate of soda, and a fair dose of bromide.

With regard to the latter ingredient, it, of course, provides a still further power of modifying the action of the solution, though I think it is better to work as closely as possible to normal conditions, and to rely upon simple dilution of the solution to produce the results required, rather than to vary the proportions of the developer.

These remarks apply equally to the production of both paper positives, and transparencies, though for the latter, perhaps the developer may be more concentrated, and the proportion of hydroquinone may be higher.

W. B. BOLTON.

HASTINGS AND ST. LEONARDS PHOTOGRAPHIC SOCIETY.—A Lantern Slide Competition will be held in June, 1894. The slides will be judged by projection on the screen with limelight lantern. The Judges will be announced at a future date. One silver and one bronze medal are offered in each class where the competitors number at least six, and, should there be less than this number in any class, one silver or one bronze medal will be awarded by the Judges in each of such classes. The following are the classes:—A, Landscape and Seascape; B, Architecture; C, Genre and Figure Subjects; D, Hand Shots; E, Flowers, Fruit, and Statuary. The Hon. Secretary is Mr. J. Harry Gibson, 4, St. James's Villas, Hastings.

THE SEARCH LIGHT.

EXHIBITION committees might, in my humble opinion, pay a little more attention to the display of lantern slides on the stands than they usually do. Too often the slides are shown without the intervention of white-covered card, or a similar material, inclined at the proper angle, while at night-time no provision is made for a supply of artificial light, so that those (and they are many) who wish to view the slides *as* slides, and not as projected enlargements, are unable to do so satisfactorily. The stand should, of course, always be placed in the best-lighted part of the gallery, though this is a custom more often honoured in the breach than in the observance.

* * * * *

I WAS pleased to notice at the Newcastle Exhibition a very fair display of stereoscopic transparencies. What a pity it is that photographers, especially amateurs, do not cultivate the art of viewing stereoscopic slides and transparencies without a stereoscope! Having this power, I was enabled, at the Exhibition mentioned, to walk round the transparencies and see them in as good relief—minus magnification, of course—as if I had viewed them by the aid of a stereoscope. For the information of those who are ignorant of the method by which the use of a stereoscope may be dispensed with in the examination of binocular slides or transparencies, I may say that it is given in the editorial article in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1887.

* * * * *

MENTION of Newcastle reminds me that in conversation with Mr. James Brown, the Secretary of the local Photographic Association, he informed me that the popularity of the optical lantern in that town for lecture and educational purposes was so great as practically to destroy a great deal of interest in purely photographic lantern lectures. The consolatory fact of the general public being so largely the gainers by the immense utility of the optical lantern should, however, atone for its neglect in the more restricted photographic sense.

* * * * *

MR. HADDON is, I believe, at an early date going to experiment on the effect of the dilution of oxygen with different percentages of nitrogen. A little while back I saw a couple of discs projected, the one with nearly pure oxygen (97 per cent. approximately), the other containing, I was informed, a comparatively large admixture of nitrogen, the exact quantity of which I have forgotten. Visually, there was no appreciable difference in the intensity of the two discs. Is this in accordance with theory, or should the one disc have been less bright than the other?

* * * * *

A SPRIGHTLY halfpenny evening paper chaffs one of the candidates for Hackney, because of his extensive use of the optical lantern at night-time for projecting views of popular and patriotic subjects for the edification of the electorate. Is this because, the candidate is endeavouring to let in a little light upon the voters or is it jealousy of the other side having been first in the field with that smart and indispensable electioneering adjunct, the optical lantern?

* * * * *

I LEARN upon good authority that the correspondence lately running in the *Daily Telegraph*, on the invasion of smoking carriages on railways by ladies, is the outcome of the recent agitation in photographic circles against the "calumet of peace" at meetings of Societies. There is talk of the formation of a photographic Society, at which beer and tobacco, or either, are to be entirely prohibited. It is confidently expected that the membership will rapidly reach a total of One—and stop there.

RADIANT.

HOT PRESSED STEEL CYLINDERS FOR HOLDING GASES UNDER HIGH PRESSURE: ARE THEY SAFE?

[Photographic Society of Philadelphia.]

THE writer's attention has been called to a new process of manufacturing cylinders for holding gases at high pressure, and having had considerable experience in the manipulation of metals by drawing and pressing, as well as in the manufacture of presses and dies for that purpose, begs leave to gravely question the safety of cylinders as made by this process when subjected to abnormally high pressure.

The subject may be properly discussed under the heads of Process, Material, Use, and Tests.

Process.—The process has been fully described in the *Iron Age* of December 7, 1893, and consists essentially of drawing or pressing a cylinder about seven inches diameter, forty inches long, and three-tenths of an inch thick, from a heated ingot of steel.

As no metal is entirely homogeneous nor can possibly be heated evenly all over, any operation of drawing must stretch the softer or hotter part of the metal more than the harder or colder parts, resulting either in unequal area of wall section or the straining of some parts of the metal fully up to the elastic limit, and possibly beyond it, or both.

In addition to this, products of this process are liable to have incipient fractures which would be hard to find by any known method of inspection, as the burnishing action of the dies will effectually hide them.

Material.—In the description of this process, as published in the *Iron Age* for December 7, 1893, the statement is made that steel of very high tensile strength is used, some of which had withstood a stress of over 100,000 pounds per square inch of sectional area.

The use of such material as this in the construction of a pressure vessel is in itself an element of great danger, as steel possessing so high a tensile strength must necessarily have a correspondingly low elastic limit, besides being hard, brittle, and generally unreliable.

We are told that this process was first used in the manufacture of explosive projectiles for the United States Government.

It will not overtax the reasoning powers of the general public to any great extent to arrive at the conclusion that either the material or process used in manufacturing explosive projectiles, whose object is to explode under certain pressure with high disruptive force, may not be exactly suitable for the production of cylinders to carry a certain pressure, and not only not burst, but to be absolutely safe from danger of bursting.

Cylinders for holding gases under pressure are somewhat analogous to steam boilers, certainly to the extent that metals of similar physical properties should be employed in their construction.

In the best steam boiler practice of to-day the specifications require the use of a steel of not less than 55,000 pounds, nor more than 65,000 pounds tensile strength, and that shall show an elongation of at least 30 per cent. in 8 inches before the point of rupture is reached.

If these requirements mean anything, they mean that men skilled in the art of constructing pressure-carrying vessels know by experience that the only steel that can be used with safety for that purpose is one that is low in carbon, of medium tensile strength, and a high elastic limit.

They can have no other reasons for compelling the use of steel that will fully meet the requirements of such rigid specifications besides those of safety to life and limb. Should any such material as we are told these cylinders are made of be delivered to a boiler shop to be used in the construction of a steam boiler, it would be immediately and unhesitatingly condemned.

Use.—It has been stated that a large number of cylinders made by this process have been furnished to the United States Government for carrying compressed air and to be used as accumulators for charging Whitehead torpedoes, and that none of them have ever exploded.

The writer does not consider this an evidence of their safety, as we are not informed as to how long they remain under pressure, at what pressure they are used, or, in fact, whether they are used at all. Again, the writer has known of many boilers in use that were in a positively dangerous condition and yet did not explode. In more than one instance the writer has been called upon to inspect steam boilers where pressures of 80 to 100 pounds per square inch had been carried to within an hour or two of the time of inspection, and on applying the hammer test has driven a two-pound hammer completely through the shell with a light blow. The fact that these boilers did not explode while in use is no evidence that they were safe.

Tests.—It has been stated that cylinders made by the process under discussion have been tested to 1500 pounds per square inch, and that they showed *no appreciable expansion.* The italics are mine. This statement alone is enough to make any intelligent man pause and question their safety, as a cylinder made of material only three-tenths of an inch thick, that will withstand a pressure of 1500 pounds per square inch without appreciable expansion, must be made

the *full* alteration required must not be attained in the solution used, some allowance must be made for the continuance of the action after its removal from it. With some films this is a very important condition, that, if neglected, is certain to cause trouble by giving excess of density or reduction, as the case may be. Collodion, on the other hand, is porous, and easily washed, a minute or two under a rose tap being more than equivalent to hours with gelatine. The various processes of development, intensification, fixing, &c., are rapid in proportion to the penetrability of the film. Albumen is not so easily washed as collodion; but, as mechanical pressure can be applied, as well as hot water, the process takes but a very short time.

So much for the class of substance to be washed. The water itself is worth a little consideration. It goes without saying the more pure it is the better, and if it was practicable, or worth the extra cost, distilled water could be preferable. Of course, except in very exceptional cases, such refinement is unnecessary. However, some water is so impure when received that it is unfit for any chemical or photographic operations without some means having been taken to purify it by boiling or filtering. Boiling and subsidence is usually sufficient treatment of ordinary water for washing purposes. That supplied by the Water Companies is *generally* pure enough without any treatment, although, just after repairs to the main, I have seen it quite muddy, unfit for use. An excellent precautionary plan is to tie a bag of three or four folds of fine flannel over the tap, which will separate all the coarser impurities, for even with the best water we get, after a few days' use, such a considerable amount of the accumulated dirt in the flannel that would surprise many. Probably many photographers have noticed a thin coat of gritty opaque matter on the surface of their negatives when left lying flat on their backs to wash in running water, which consists of the impurities alluded to, deposited on and retained by the gelatine. Rubbing the film gently with a tuft of soft cotton, and giving a rinse afterwards, will easily remove it in the *first* instance, but if allowed to dry on, it becomes part and parcel of the film, and no after washing will get rid of it. The very brief washing some operators deem sufficient for the gelatine negatives and transparencies cannot, from the nature of things, effectively remove the soluble matter. No harm may apparently accrue from such perfunctory treatment for some little time, unless many prints are required, when the combined action of light and warmth, gradually exsiccating the film and decomposing the salts of silver that should have been washed out, cause spots and stains to appear, gradually increasing until the negative becomes useless, or at any rate very defective. I have known negatives on exceptionally horny gelatine washed all night, and then, after twelve months, become unprintable, and the hypo salt even then, by the drying and contracting of the film, exude from the surface through a coating of varnish. Why short washings are looked on as sufficient by many is because very few prints are required, probably not more than one or two at the outside, and then the negative is put away; or, it may be, they are not printed from at all, but stored in a box or envelope; the result of five minutes' washing is then exultantly shown as a (fallacious) proof of its sufficiency. Hyposulphite left on the film is not only a danger to the permanency of the negative as a perfect *cliché*, but is the cause of spots and markings on the prints themselves. A tiny crystal of hypo coming in contact with free silver nitrate in the paper will cause a dark spot. If the paper is home-sensitised albumen paper, it is seldom used bone-dry, or never ought to be, as too dry paper of this kind gives inferior prints; the moisture effectively assists the spot-making performance, which soon becomes visible on both negative and print. With the ready-sensitised paper, the danger is somewhat mitigated, the paper being used dry, and the free silver in it small in quantity.

It may be asked, What is a properly washed negative; or, rather, how long should a negative be washed? This, as might be inferred from the foregoing, entirely depends on the character of the film. An average commercial film may be properly washed in two or three hours in properly managed running water, providing the temperature is not lower than 60° or 65° Fahr. Under any circumstances a thorough soaking is necessary, and removal of dangerous matters cannot be properly effected in less than an hour or two. On account of the slow elimination of the hypo salts, frequent changes (say, every half hour) of the water, provided it is in sufficient quantity, is nearly as effective as immersion in running water, if the plates during the process incline film downwards. The violent application of water from a rose tap may clear the surface from hypo in a short time, but will not abstract it from the body of the film much more rapidly than quiet soaking; as a rule, a number of negatives are washed at the same time, when any advantage to be obtained from the rose-tap method is scarcely available.

The manner in which a negative develops is some guide to the time advisable to give to washing, hard resistant films being slow to *begin* development, but, once started, go on with fair rapidity. One of the opposite character, of a soft, easy, permeated gelatine, allows the image to start out almost as soon as the developer is poured on, the exposure in both being correct. In the latter case a shorter washing is required than in the former, on account of the film being more porous and the soluble matter more easily abstracted. There is considerable variation with the same batch of plates in this respect, dependent on their storage. A plate that will quickly and easily develop when new, after keeping some time in a warm, dry atmosphere, takes a longer time to develop, although the sensitiveness may remain the same. The preparation of the emulsion also materially influences it. Chrome alum added makes the gelatine become very horny and impenetrable. The *quantity* of alum added has much to do with the result, but a very small percentage will, in course of time, produce a very hard film. The development of the plates will thus, in a measure, be an index to the kind of film, and whether prolonged or moderate washing will be necessary. There is little doubt but that the very perfunctory and inadequate manner in which many conduct their washing operations will sooner or later impair the value of the work.

Prints lifted from one solution to another in a mass, as frequently done, is a slovenly, dangerous proceeding, as, under such circumstances, they rarely get thoroughly separated, and many become acted on irregularly, and some scarcely at all. Gelatine prints being heavier and having a softer surface than albumen, require special care in this respect, as they are liable to settle at the bottom of the washing trays, and stick together, unless effective measure are taken to prevent it. Gelatine prints or negatives on paper take much less time than negatives on glass or celluloid to wash, the film being thinner and attackable on both sides, the porosity of the paper offering very little hindrance to the process. There is one important difference in the treatment of albumen and gelatine paper. The former can be quickly and effectively washed with hot water, a much better solvent of the hyposulphites than cold, but to use hot water to gelatine would simply mean destruction; therefore, being debarred from the use of heat, the process must be much lengthened to obtain the same ends. The most suitable temperature for gelatine print-washing is 60° or 65°, not more. It is fortunate that a reasonably prolonged soaking in water will not deteriorate the quality of a gelatine print, as it does albumen, which suffers considerably not only in brightness and colour by protracted washing, but also in permanency. Long soaking for albumen paper is undoubtedly a mistake from every point of view. The hyposulphites must be got rid of, but get rid of them as rapidly as possible, and, if done in a systematic way by alternate draining, pressure, hot and cold water, then the bugbear of fading prints from imperfect removal of hypo will be done away with for ever, and that equally pernicious practice of long washing not required. When dealing with large quantities of prints, or almost anything else, a different method of procedure is necessitated than when small quantities are being treated. I have never seen any plan better than that adopted by Mr. Bedford for quantities, and the permanency of his work is a tolerable guarantee that it was effective. The mode of working was this: After toning, the prints were placed in a tray of water, and from thence put one by one into the hyposulphite fixing bath, face down. When, say, thirty sheets of prints were put in the bath, they were one after the other, beginning with the first put in, turned face up; this went on for fifteen or twenty minutes, alternately face up and face down; then they were, *one after the other, beginning with those put in first*, transferred to a tray, through which a rapid stream of water continuously flowed, from that into another, and then into a third. Most of the hyposulphites were removed in these preliminary washings; finally, the prints were put into a large slate tank, with a false bottom, the water being constantly agitated by a small water wheel, which was geared to a loosely hung paddle that moved to and fro in a wire cage; a double plug drew off the water from below the false bottom, and also in this space was a coil of hot-water pipes connected with the boiler, by which means an equable temperature could always be maintained. The following was the arrangement:—

A long rod of one-inch ash, provided with a float at one end and cased with vulcanised rubber at the other, acted as a break on the edge of the wheel, exerting pressure, corresponding to the height of the water in the tank. Of course, the less resistance the paddle had to contend against, the faster it would work. So this plan was devised; this moderates the pace and prevents the prints being damaged, and unnecessary wear and tear put on the machine. It had the recommendation of being automatic and never getting out of order.

In conclusion, the very inadequate washing many prints and negatives get will presumably shorten their existence. I think no more dangerous plan can be adopted than taking a handful of prints together out of the hyposulphite solution and trusting to their being properly separated afterwards. If quantities are being dealt with, even with such small lots as a dozen or two, it is best to treat them separately. The two principal points in effective washing are due attention to the temperature and frequent changes of the water.

EDWARD DUNMORE.

REVIEW OF THE THEORY AND USE OF COPPER SALTS IN PHOTOGRAPHY.*

V.—COPPER SALTS IN NEGATIVE PROCESSES.

ORGANIC developers are so generally employed in negative processes that special interest attaches to any inorganic salts which render visible the latent image. In 1863, Millon and Commaille described the powerful reducing action of ammoniacal cuprous oxide on silver compounds, especially the chloride. This substance was recommended on this account, not only for the quantitative determination of silver, but also for the recovery of silver from residues.* Not only is ammoniacal cuprous oxide an energetic developer for silver chloride, but it was shown by Carey Lea, in 1877, that the ammoniacal solution of cuprous chloride will develop even bromide plates. This was confirmed by the experiments of Lumière in 1887.† The preparation of the ammoniacal cuprous oxide can easily be effected by placing black oxide of copper and copper turnings in a bottle filled with strong ammonia. The addition of a small quantity of copper sulphate is said to assist the process, one drachm of the sulphate being used to three ounces of ammonia. The bottle is frequently shaken for a week, until the ammoniacal solution is colourless. The metallic copper has then reduced the black oxide to cuprous oxide, and the solution is ready for use. Ten drops of the solution in one ounce of water will give a developer of moderate strength. The effect is increased by the presence of organic matter, such as lactic or formic acid. The colour of the image may be varied in paper positives developed by this means by the addition of various organic substances. Thus, formic acid gives a clear black; manna, tannin, or lactic acid give warm brown tones; coffee gives delicate light tones.

The addition of copper sulphate to the ordinary iron developer for wet plates has been long recommended for preserving clearness in the negative, and for improving the colour and grain of the silver deposit.

In the nitrate of silver bath used in the wet process, the presence of small quantities of copper nitrate is said by Eder to diminish the intensity of the image, and, if such a sensitising bath is used for sensitising albumenised paper, the prints are liable to bleach in the hyposulphite bath. This influence of copper nitrate is of the more importance, as silver nitrate made from coins is very likely to contain traces of copper.

The influence of copper salts in emulsions has been a subject of considerable discussion. Cary Lea, in 1869, advocated the addition of a small quantity of copper chloride (1 : 12) to the bromide emulsion, on the grounds that its acidity prevents fog, and that it tends to produce a more vigorous image. Cowan has more recently recommended a bath of copper chloride (1 : 480) as a remedy for green fog.‡

Abney has explained, at some length, the influence of copper salts in emulsions.§ The addition of copper chloride or bromide to cure a fogged emulsion is effective owing to the decomposition of silver sub-bromide by the copper salt, thus :—

$$2Ag_2Br + 2CuBr_2 = Cu_2Br_2 + 4AgBr.$$

Similarly—

$$2Ag_2Br + 2CuCl_2 = Cu_2Cl_2 + 2AgBr + 2AgCl.$$

But if copper bromide is used to decompose the silver nitrate in emulsions, and the nitrate is in excess, there is danger of fog being produced, for the copper bromide is almost certain to contain some traces of cuprous salt, which, with the silver nitrate, would cause small quantities of silver sub-bromide to form in the emulsion, thus :—

$$Cu_2Br_2 + 4AgNO_3 = 2Ag_2Br + 2Cu(NO_3)_2.$$

An excess of bromide, however, would remedy this defect. Abney also states that the addition of copper chloride to fogged emulsions causes a diminution in sensitiveness, and alters the molecular state of the silver bromide from the grey to the red form. It is most effective, however, in producing clear and vigorous negatives.

VI.—INTENSIFICATION WITH COPPER SALTS.

When a soluble bromide is added to a solution of copper sulphate copper bromide is formed, which reacts upon the metallic silver forming the negative image, forming silver bromide and cuprous bromide, thus :—

$$2Ag + 2CuBr_2 = 2AgBr + Cu_2Br_2.$$

The colour of the negative thus becomes white, and intensity may afterwards be produced in either of the two following ways recommended by Abney. Alkaline pyrogallic acid may be used to reduce the silver salt, giving a yellowish brown deposit of metallic silver; or the bleached negative may be washed with a twenty per cent. silver nitrate solution, which converts the cuprous bromide into silver sub-bromide, and so thickens the silver deposit—

$$AgBr + Cu_2Br_2 + 4AgNO_3 = AgBr + 2Ag_2Br + 2Cu(NO_3)_2.$$

Bottone recommends treating the bleached negative with dilute ammonium hydrate (1 : 12), which produces an image of a warm chocolate tone, very non-actinic, and with clear shadows. Hyposulphite must be carefully eliminated. The chocolate colour is probably due to the formation of an ammonia compound of cuprous bromide. The intensifying solution may be easily made by mixing a four per cent. solution of potassium bromide with a four per cent. solution of copper sulphate, and decanting the clear liquid.

An older process of copper intensification is to use a solution of cupric chloride to convert the silver image into silver chloride, which is finally reduced with alkaline pyrogallic acid. The reactions would be similar to those described above, and, as a brown compound of cuprous chloride with sal ammoniac, having the composition $Cu_2Cl_24NH_4Cl$ is known, there may exist some convenient modification of the above-mentioned methods of darkening the bleached image.

Quite recently a solution of bromo-iodide of copper has been advocated for intensification of negatives.* The solution is made by dissolving 200 grains of copper sulphate in 6 ounces of water, and adding 2 ounces of water containing 16 grains of potassic iodide and 40 grains of potassic bromide. The negative first bleaches and then becomes canary yellow. It is then washed well, and blackened, either with hydroquinone or with a strong solution of sodium hyposulphite containing a little silver nitrate. The redevelopment can take place in the strongest daylight; the result is permanent, and, by varying the proportions of the developer, brown and sepia tones can be obtained.

J. VINCENT ELSDEN.

(*To be continued.*)

* *Fresenius, Zeitschrift für Analyt. Chemie*, ii. pp. 212, 213.
† *Bull. Assoc. Belge*, 1887, xiv. p. 525.
‡ THE BRITISH JOURNAL OF PHOTOGRAPHY, 1882, p. 60.
§ *Instruction in Photography*, p. 23; *Photographing with Emulsions*, pp. 229, 239.

* Continued from page 249.

PROFESSOR HERKOMER ON PROCESS WORK.

AT the Annual Dinner of the International Society of Wood Engravers, Professor Herkomer delivered himself of the following remarks on wood-engraving *versus* process work.

"What," he asked, "was the mission of the Society? It was to try and save the beautiful art of wood-engraving from the death that threatened it on all sides. The Society believed that it would hit upon some plan whereby this great object could be attained, directly or indirectly, through the efforts of its members. They included desperate men—men who were fighting not only for the life of an art, but for their own lives. It had become a question of bread-and-butter to a set of art workers, and he was confident that these men, standing shoulder to shoulder, would devise some means whereby their art could take its proper place again. And what did the civilised world not owe to the wood-engraver? Woodcuts had penetrated to the furthermost corners of the earth and brought joy to the lonely settler's hut, even as they had brought delight to the palaces of monarchs. Artists, again, assuredly owed as much to the interpreters of their black and white work as musical composers and dramatists owed to theirs. To the right-hearted public the Society appealed, to place before it the facts of an unwholesome change which was spreading over the world of art illustration. Art work had been exchanged for mechanical process. It was a conjuring trick which the public, asking

* Anthony's *Phot. Bull.*, No. 6, 1893.

no questions, have tentatively accepted for the real thing; but this must not, and if the Society could help should not, continue for long. Twelve years ago the American magazines were in the full enjoyment of their newly gained reputation for refined wood-engraving treated with originality. When in 1882 he visited the offices of these publications in America, his delight was great when he saw all the best woodcuts of our weekly illustrated papers covering the walls of the engravers' department, and was told that these beautiful specimens were the only masters which the Americans had had. He was reminded by them of Mr. W. L. Thomas's efforts to reproduce an artist's experiments in some newer methods of drawing by the use of washed tones with line, or with chalk, or pen or pencil, or with anything which liberated the artist's hand from the trammels of a material. But now experiments were made with a process only; and, thank goodness, it gave trouble enough. Even engravers were starting process-block manufactories. The ease of mechanical reproduction had induced such a surfeit of illustration that its true position had been brought into contempt. By this overdose of illustration we failed altogether to give to it its educational value. They might get sick to death of illustrations, and pray for some publication that would have the courage to clear them out. In this chaotic state of things "process" work was no longer defined, but was made to stand upon an equality with art work, which was the saddest of all conditions, because masterpieces of wood-engraving were still produced. An artist's interpretation of another artist must always remain the true method of artistic reproduction, for no mechanical process could take the place of the living artist. When a mechanical process could invent the subtle differences between the lines in the sky, the foliage, and foreground, with equal intelligence, he would turn that process into a limited liability company. Much has been written about the immorality of cheapness. The sister sin, and the outcome of it, was the immorality of haste, and this was the cause of the threatened extinction of wood-engraving. Haste was the black plague of modern times, for it entirely destroyed the repose so necessary for the production of great art. But the tide would turn, and they might hope that all the engravers would not then have become railway porters or omnibus conductors, or permanently taken up their abode in the workhouse. A revival would be possible before very long, and when it did come there would be a proper adjustment of the positions of art work and mechanical work. In the present position he would suggest a compromise, and urge the conductors of illustrated papers to use process work for the reproduction of line alone, leaving tone work to express the more complete work of the artist, which must be rendered again by the artist engraver. Quick work from an artist could be welcomed, but it was a dangerous thing to impose rapidity on the engraver, and once for all it should be avoided. If that were the rule, artists would have less cause to complain of engravers spoiling their work, and would hardly wish to rush into 'process' as the only alternative to bad engraving. Therefore let them accept the mechanical means at hand for the reproduction of the artist's rapidly drawn line, because raggedness occurring in the line, reproduced by process, was far less injurious to the quality of the work than the "straightened-up" and stiffened line which was so often seen in the engraver's facsimile when he was pressed for time. It was not a matter of money, but one of time, which had brought about the danger to wood-engraving. They might, by accepting his compromise, give up line to photography when time actually pressed, for every engraver and every artist knew that, even in facsimile, the skilful engraver's hand was far the best. As perfect facsimile work by a master hand, he instanced the work from the drawings by Adolph Menzel of generals who lived in the time of Frederick the Great, which he had brought for their inspection. Perfect, indeed, was the full expression of the artist's line in all its gradation of depth and in all its movement in these engravings. But he had no need to uphold the masters of the past, for there were master engravers among then now; so let it not be said, to their everlasting shame, that they had allowed them and their art to perish. Let it not be said that the illustrated weekly papers, which had been monuments of artistic work, had ceased to care whether they raised the public taste or not. Let photography, in all its varied applications to mechanics, take its proper place—as a handmaiden to art only, and let it, in that capacity assist where and when it could, but let nothing interfere with the rights of the artist engraver, whose skilful hand alone could interpret the soul of another artist's work."

SOME RECENT ADVANCES IN PHOTOGRAPHIC CHEMISTRY.

[Society of Arts.]

PHOTOGRAPHY, as ordinarily practised, is an empirical art. Although it is founded upon, and intimately connected with, certain branches of chemistry and optics, very few photographers know anything of these sciences. The ordinary practitioner, whether amateur or professional, works entirely by rule of thumb, and is guided by tradition rather than by reason. It is natural, and perhaps necessary, that this should have been so at first, but it must be allowed that the sooner the art is put upon a sure foundation the better, though, doubtless, there will always remain some who will prefer the old ways.

There is now a larger amount of scientific work being done in connexion with photography than heretofore, and I would suggest that the time has come when we should make a determined effort to get rid of uncertain and obscure processes in serious work. When one's only aim is amusement, then, of course, there must remain free liberty to follow any fancy, but for the production of valuable records of any sort, whether pictorial or otherwise, I think the time has come when photographers ought to avail themselves to the fullest extent of all the scientific knowledge at their disposal. Any who are unable to guide themselves should, as is usual in other industries, seek the advice of those who are able to give them assistance.

As an example of the disastrous effects of working in the dark, I may say that I have heard of photographers, both amateur and professional, who have many large and valuable negatives intensified by the mercury and silver cyanide process that have so much changed from their original condition as to cause grave anxiety. It would have been wise, though perhaps hardly possible, if photographers had declined to use this process until it had been properly investigated by a chemist. Then no trouble would have ensued.

We may for convenience sake, with reference to the majority of photographic operations, divide the photographer's work into two parts, namely, the making of the negative and the making of the print. If we except those cases in which, for scientific purposes, the negative itself is preserved as the record, as, for example, in spectrum work, then the end and aim of the photographer is the preparation of the print, and the negative is nothing more than the tool used in its production. In this sense, therefore, the print is of much more importance than the negative. It should be of a permanent character, while the tool used in the making of it may perfectly serve its purpose, though it were so short-lived as to fade away immediately after it had yielded the print. But it is convenient, and often of great importance from an industrial point of view, that the negative shall be stable; and if the negative is not right the print must be wrong, and if the negative is produced by uncertain processes we never can tell what the print will be. The science of negative-making becomes therefore, I think, of as much importance as the science of printing processes. As the chemistry of these latter has received enough attention to enable any one to make prints that are perfect from a chemical point of view, while the chemistry of negative-making has been very largely neglected, I have spent a good deal of time during the last few years in examining some of the operations in common use, and propose this evening to look at one or two matters in connexion with the chemistry of negative-making on gelatine plates.

The silver bromide particles held in the gelatine film are so changed by suitable exposure to light, that the developer is able to take away the bromine from them. In a chemically perfect negative, after fixing and washing, the image will consist of pure metallic silver, and it does not matter at all where the bromine has gone or what changes it has produced in the developer so long as no trace of it, or what it leads to, remains behind; but, when bromine is added to an alkaline solution of pyrogallic acid, it produces a brown colour, and, as there is most bromine removed where there is most silver deposited, the brown colouring matter will be, roughly speaking, proportional in quantity to the density of the negative, unless some of it is removed. There is, perhaps, no *primâ facie* reason why an image of this composite character should be objected to. Indeed, the presence of this brown stuff may improve the negative if the film has too little silver in it to give proper density alone, or if the exposure has been too short to change a sufficient amount of the silver bromide into the developable condition, or if the development has been unduly curtailed. It is easy to see, therefore, that a cheap manufacturer, and an incompetent, rule-of-thumb photographer, may have definite reason for advocating the use of stain-producing developers. But to rely upon staining matter in the making of negatives is to lean upon a broken reed. The residues obtained by the partial destruction of some complex organic substances are almost pitchy in character, and seem to be very unalterable by ordinary atmospheric influences. But the staining matter produced by the oxidation of developers, so far as I have yet discovered, is never of this kind. Pyrogallic acid generally yields brown products, inclining sometimes red and sometimes to yellow; but twice I have obtained solutions of so fine a deep blue colour, that it might have been mistaken for Prussian blue. These blue colours, on standing for a few hours, faded to a yellowish brown. The deep reddish brown colour obtained by simple aerial oxidation of a solution of pyrogallic acid and sodium carbonate, becomes perceptibly lighter in a day or two when bottled up, and in a week or so may have lost perhaps half the depth of its colour. I think one is quite justified in saying that neither the quantity nor the quality of these staining matters can be controlled, that they are in every way uncertain,

and that, therefore, they ought to be rigorously excluded, or perfectly removed, from every negative of value.

And these are far from being all the reasons why the presence of staining matter in negatives should be avoided. A silver image is reliable, and can be chemically worked upon with perfect certainty as may be desired. But staining matter cannot form a foundation for after work, and it will suffer change with almost every operation upon the negative. Its colour will change and rechange, and by washing it will, under some circumstances, be partly removed. We know very well that, when a part of the image is removed by applications to the surface of the film, the shadows lose a greater proportion of density than the lights, because the dark detail is in the upper or outer service of the film only, and so is more easily attacked. Therefore, granting for the moment that a negative with an image that consists partly of staining matter has correct gradation, if a part of the staining matter is removed, the gradation will be falsified; and this alone would be sufficient reason for condemning the use of staining matter in negative-making.

There is another source of staining matter, namely, the oxidation of the developer by its exposure to the air during development. The colouring matters so produced may or may not be the same as those resulting from the action of bromine; but, so far as my experiments go, they behave in a similar manner with reference to those changes that are of practical interest to photographers. The darkened solution will soak into the gelatine, and colour it more or less uniformly; and it appears that it may, perhaps, also intensify the image by deposition upon it, if we take into account recently published experiments. Mr. A. W. Dollond has shown how, by the use of glycerine, gold may be deposited upon the metal in a platinum print, the platinum apparently remaining quite unaffected, and merely determining by "contact action" the precipitation of the gold from a solution that is ready to deposit it upon the least disturbance. Mr. E. J. Wall has confirmed the results of earlier workers, who found that silver might be similarly deposited. And, coming still more closely to the point under discussion, Dr. R. E. Liesegang has recently observed that substances of the nature of pigments may be deposited upon a metallic basis in an analogous manner. He found that the staining matter produced by the aerial oxidation of pyrogallic acid, hydroquinone, and similar substances in alkaline solution, would deposit upon and intensify the image of a silver print. A solution of amidol with carbonate of soda he found would deposit coloured oxidation products upon the image of a platinum print. It is, therefore, but natural to suppose that probably sometimes the staining matters produced by aerial oxidation in developers will deposit upon the image in negatives, and add to the oxidation products that are already there, produced by the action of the bromine, as before described. I have made one experiment in this direction, by soaking part of a negative in an alkaline solution of pyrogallic acid, allowing it to remain until the solution and the negative were both well coloured, and then washing for a short time. The colour, of course, retarded printing; but I could not discover any intensification effect. It is possible that the staining matter produced by aerial oxidation may attach itself more readily to the image when the image is freshly formed, or it may be that it does not attach itself to the image at all under the conditions which hold during development.

Every photographer knows how to set to work to avoid the production of staining matter, but I think that very few know how to get rid of it when it is in a negative. The usual method is to apply an acid solution —a so-called "clearing solution." The stain may disappear, and then the photographer imagines that it has gone. The error of this empirical and rule-of-thumb method can be easily demonstrated. If hydrochloric acid, sulphuric acid, sulphurous acid, or alum is added to an oxidised alkaline solution of pyrogallic acid, the brown colour is changed to a lighter brown, and immediately a yellowish insoluble matter begins to fall out of solution, and continues to increase in quantity for some considerable time. In a negative where there is not much stain this change of colour may cause it to disappear; and the superficial observer would then think that he had got rid of it, while really he had made it, or a large part of it, more permanent than before by rendering it insoluble. It is easily shown that this precipitated matter generally constitutes a very important part of the staining matter, by dissolving it in carbonate of soda and comparing the colour so obtained with that of the original, or of the part not precipitated. Citric acid differs from the acids mentioned above, in that it gives no precipitate; but citric acid and alum together give a copious precipitate, even when the quantity added is many times more than sufficient to render the solution strongly acid.

It appears, however, to be possible in aggravated cases to get a small residuum of stain from the use of pyrogallic acid, and rather more from the use of hydroquinone, which it is very difficult indeed, if not impossible, to remove. This residual stain I find to be quite unaffected in appearance by any of the usual clearing solutions, unless they contain iron, and then the colour is somewhat changed in tint, and, if anything, a little darkened. It may be remarked also that staining matters vary somewhat, and that exceptions may be found to the results I have described, but I believe that such exceptions, if any exist, will be found so rarely that it will be practically impossible to take cognisance of them in framing rules for general work. Ferrous oxalate has often been recommended as the most perfect developer when stainless negatives are desired; but, although ferrous oxalate is a very useful reagent, I cannot confirm the superiority that is claimed for it. Every developer in use will give clean, greyish-black negatives if properly employed; but, by making a careful comparison of ferrous oxalate with eikonogen on a plain gelatine film, I find the iron developer to leave a slight colour, which is very difficult, if at all possible, to remove, while the eikonogen leaves none. I have no doubt whatever that metol, amidol, and rodinal would all show a like, if not a more marked, superiority. It may be observed that in making such comparisons it is necessary to use a simple gelatine film, because the stain left by ferrous oxalate, when it is applied in the same manner as is usual in development, is easily masked, and it should be understood, too, that the difference is slight. Still, what difference there is, is in favour of the alkaline developer.

The rules for practical work that I have deduced from my experiments I have followed for some years with uniform success, nor have I ever heard of dissatisfaction from those who have accepted my suggestions in this matter. I believe that the greatest freedom from stains due to the developer is secured by the use of an alkaline developer with sufficient sulphite, and fixing in a solution of hyposulphite, to which sodium sulphite and sodium carbonate have been added. A very few minutes' washing between development and fixing is sufficient, but the fixing solution should not be used after it gets dirty or discoloured. After thorough fixing should follow a thorough washing, and with a well-coated plate this will be a matter of two or three hours or more. By this method any staining matter is kept in its most conspicuous form, and in its soluble, and therefore most readily removable, condition; and it must surely be allowed that this is the right principle to work upon. Alum should never be used until the washing is finished, because it retards the washing; so-called "clearing solutions" should not be used, both because they tend to make the stain less obvious, and they make its removal impossible; acid fixing baths should be avoided for the same reasons, and, if they harden the film, their use is still more detrimental, because, in doing so, they render the washing more tedious or less perfect.

CHAPMAN JONES.

(*To be continued.*)

LECTURES ON COLOUR PHOTOGRAPHY.

UNDER the auspices of the Committee of the Affiliated Societies, Mr. E. J. Wall delivered two lectures, on Monday and Friday last, on *Colour Photography*. The Cordwainers' Company kindly placed their hall at disposal for the purpose, and Sir H. Trueman Wood (President of the Photographic Society of Great Britain) took the chair on both occasions. About 170 attended the first lecture. In opening his subject, Mr. Wall explained the formation of colour, projecting a spectrum and showing the effect of natural bodies in absorbing and reflecting certain colours. The history of the attempts to form photographs in colours dated from 1782, when Senebier recorded the first attempts. He was then followed by Seebeck in 1810, Herschel in 1839, Hunt in 1840, Becquerel in 1848, Niépce de St. Victor, Poitevin, Baer, St. Florent, Veress and Kopp.

It was pointed out that these attempts were without permanent results, as no means had been found of fixing the colours. The sensitive salts of silver which were used could not be fixed by the ordinary photographic methods, the chemicals used for this purpose destroying the colours. In 1891, Dr. Lippmann, of Paris, announced that he had obtained photographs in natural colours which were absolutely permanent. The disposition of the apparatus used by Lippmann was shown, and then the explanation of the formation of these colours, which are entirely due to the silver being deposited in laminæ of definite distances apart, which reflect the particular coloured light, which had a wave length double that of the thickness of the silver deposit. The advances made by Lippmann, Lumière, and Valenta were set forth, and the lecturer concluded by showing specimens by Lippmann and Valenta, which proved that the problem was once for all settled, but that these so-called photographs in natural colours possessed of themselves absolutely no colour. All that they did was to analyse the light incident on them, and reflect the particular colour.

On Monday, before an undiminished attendance, the lecturer devoted the second lecture to *Heliochromy*, or the process of producing reproductions of objects in their natural colours by means of the synthesis of light, and performed some interesting experiments with a triple lantern,

of a metal either with an originally very low elasticity, or one whose elastic limit has been seriously impaired, if not fully reached, by some process of production.

Again, referring to steam-boiler practice, if a boiler-maker were required to make a pressure-carrying vessel to withstand a pressure of 1500 pounds per square inch, he would be required by the inspection laws of most cities to use the best quality of material of a thickness of $1\frac{1}{4}$ inches, more than four times the thickness of the material in the cylinders under discussion.

The article in the *Iron Age*, before referred to, states that some of these cylinders have been subjected to a pressure of 5000 pounds per square inch.

Let us hope that they were immediately destroyed after such punishment. The man who would subject a cylinder whose walls were only $\frac{3}{10}$ inch thick to such an enormous pressure and afterwards send it out for use has not brains enough to have a headache.

A pertinent question at this time would be, What constitutes a safe cylinder for holding gases under high pressure? To which there can be but one answer, viz., One made of the best quality of mild steel that shall not contain more than $\frac{2}{10}$ per cent. of carbon and that shall have a tensile strength not exceeding 65,000 per square inch of sectional area, and shall show an elongation of at least 30 per cent. in eight inches before showing any fracture, made by a process of manufacture which does not tend to destroy the physical properties of the material, properly proportioned to the pressure to be carried, properly inspected and tested at a pressure of not more than 25 per cent. greater than it is intended for.

By such means, and by such means alone, can we produce cylinders to carry gases at high pressure whose use will not be attended with positive danger to life. S. Ashton Hand.

PROJECTED PORTRAITS.

XIII.—Mr. Henry Stevens.

Of that bourne whence few cameras return unsold Mr. Henry Stevens is the presiding deity. He is, in fine, the head and front of Stevens's great sale rooms, whither, week by week, on the ceaseless tide that bears orchids, bulbs, rose-trees, pigeons, fowls, furniture, *bric-à-brac*, sporting tackle, machinery, tools, scientific instruments, and Great Auks' eggs, into the ocean of immeasurable dispersion, the flotsam and jetsam of the photographic world unerringly finds its way. A morning at Stevens's is essential to the complete education of a man about town, and the photographer who has not stood or sat under Mr. Henry Stevens with his 'ammer in his 'and may accuse himself of having skipped a most interesting chapter in the current history of photography. All photographic roads lead to Stevens's, and every Friday, with the unruffled serenity of remorseless fate, Mr. Stevens "knocks down" the wreckage of photographers' studios, amateurs' dark rooms, and dealers' warehouses, administering the final blow to the dreams and hopes of many a disillusioned inventor and disappointed photographer or tradesman. *Sic transit gloria mundi*—to the highest bidder. In the rostrum Mr. Stevens is a model of unimpassioned dignity and politeness, and several times, when I have ventured to catch his awe-inspiring gaze, with the intention of humbly bidding for a little lot, I have felt that in a previous stage of existence he must have been at least a Bishop or a Cabinet Minister. If ever I achieve the proud and glorious distinction of being sold up, it will materially add to my emotions of exultation at being disposed of without reserve by the amiable Moloch of King-street, Covent Garden. Mr. Stevens finds relief and change from his professional duties in photography, in the practice of which he has acquired much distinction as an amateur. For years past his photographs of flowers have been the wonder and delight of us all, while, as to his cat and dog studies, they are inimitably good. He has made the world acquainted with the portrait of his favourite terrier, and has also shown that in his daughters he possesses most charming models. He has been the recipient of many medals, and, if ever it fell to his lot to "put up" his own powers as a photographer for sale, it is tolerably certain that there would be a keen competition for the possession of them.

XIV.—Mr. Hedley M. Smith.

To photographers all over the country the figure of Mr. H. M. Smith is a familiar one, although, it is true, there is not much of it. But what he lacks in personal size he makes up in volume of voice. From the nature of his occupation, it is lucky for him that his voice has that combination of resonance and sweetness which is its characteristic, for Mr. Smith is (as, of course, every one knows) an Ambassador of Commerce, bearing the credentials of the Anglo-American Court of Eastman to the latter's innumerable friends in Great Britain. Mr. Smith's godfathers and godmothers christened him "Hedley M.;" the photographic public call him "Eastman" Smith, as if envious of his possession of the rare, patrician, unadorned, patronymical appellation of Smith. Mr. Smith was once secretary of the North London Photographic Association, and in that position exhibited a fine capacity for good work. Then he was in business in the country as a photographer and dealer, but, failing to find a provincial town large enough to comfortably hold him, he joined the Eastman Company, of whom he has long been the valued representative. His armorial bearings are a roll-holder rampant on a field of film azure, with Solio *or*, on a shield, with the mystic word "Kodak" inscribed on it. [*Note.*—We suspect our contributor is a bit mixed in his heraldry, but we believe he means well.—Ed.] Mr. Smith is a great figure entirely at Convention meetings, where he is foremost at passing round the hat for benevolent purposes.

XV.—Mr. F. W. Hindley.

I have been told that Mr. Hindley is not entirely unconnected with a very old-established house of photographic dealers, whose *locale* was formerly near Queen Victoria's own Theayter, but I mention the matter under all reserve. Not to know Mr. Hindley is to "argue one's self unknown" in a photographic sense; for it may be safely said that Mr. Hindley, as well as the famous establishment with which gossip associates his name, knows everything and everybody—photographically, of course. *Ergo* Mr. Hindley is photographic omniscience concentrated and personified, and he is a power in the photographic world, although I am sure his native bashfulness keeps him quite unconscious of the fact. If it is Mr. Hindley's ambition to be considered a good man of business, we must all allow that he has attained it. He handles (metaphorically) a good many hand cameras, and uses one with, unlike most hand-camerists, great success. Every year he spends several weeks in the wilds of Western Ireland, and always returns with a collection of snap-shots of mountain views, groups of peasantry, cottages, sea studies, waves, street and market scenes, from which he makes lantern slides. These he shows to a few Societies, to the accompaniment of a humorous lecture, which clearly proves that he is *facile princeps* at the game. Naturally in the use of a hand camera he should be *facile*. Let us hope he is a good remembrancer, and never gets thirteen pictures on twelve plates.

XVI.—Dr. Burton Coxe, M.D., F.R.G.S.

Dr. Burton Coxe is President of the Brondesbury Camera Club, and has secured undying renown by his luminous treatise on the photographic applications of hydroxylmonohydride. Further particulars of his career can, doubtless, be obtained from anybody connected with photography.

Limelight.

(To be continued.)

THE USE OF THE NICOL PRISM.

In his paper on the subject recently read before the Photographic Society of Great Britain Mr. Birt Acres thus describes the use of the Nicol prism:—

A very large portion of the light reflected from natural objects is polarised, but this polarisation, as it is called, does not produce any visible effect unless some means are employed of analysing the polarised light, and the object we wish to attain is to be able to extinguish portions of this reflected light before it reaches the photographic plate. You are all, doubtless, acquainted with the peculiar property of *double refraction* which is possessed by Iceland spar (and some other crystals in a less marked degree), that is, that when an object is looked at through the spar two images of the object appear; or, if a perpendicular beam of light is allowed to fall on to it, two beams of light emanate from it at the opposite side. I dare not attempt to take up your time by going into the wave theory of light, which is, I presume, familiar to most of you; but, for the information of those who have not studied the subject, double refraction is accounted for by the wave theory of the propagation of light on the assumption that, when a beam of light enters a crystal of Iceland spar, its vibrations (which are across the path of propagation) are reduced to vibrations in two directions only, which are at right angles to each other. A very clever optician by the name of Nicol conceived the idea of utilising this peculiar property of Iceland spar to enable him to analyse and examine polarised light; and, reasoning that, as the beam was split into two portions by the spar, these beams must be travelling through the crystal at different angles, he therefore took a crystal of spar, and, cutting it angle-wise, carefully polished the cut surfaces and

cemented them together again with Canada balsam. The angle at which the crystal was cut was of the requisite angle to ensure the total reflection of the more refracted ordinary ray, whilst the less refracted secondary or extraordinary ray was allowed to pass straight along. With the aid of a piece of spar adjusted in this manner (which is now universally known as a Nicol prism), we are able to examine the phenomena of polarised light with ease. Thus allow a ray of light to fall on a polished surface—say, water—at its polarising angle, 68 degrees, standing in such a position that the light is reflected direct to the eye, and adjust a Nicol prism so that this reflected light passes through it in the direction of the eye, but hold the longer axis of the face of the prism so that it is perpendicular to the reflecting surface (water in this case), the ray of light will be still freely transmitted to the eye; now slowly revolve the prism, but keeping it in the same direction, and gradually the reflected light will begin to disappear, until, when a quarter revolution has been reached, the reflected light will disappear totally, and all the light that will reach the eye through the prism will be that which is reflected from the surface of the water at other angles, and therefore not polarised; continue to revolve the prism, when the reflected light will gradually reappear, until, when half a revolution has taken place, the light will apear again as brilliantly as at first; continue revolving until three-fourths of a revolution has been made, the light will again disappear, to reappear again when a full revolution of the prism has been made.

We now come to the practical application of this piece of apparatus to photography. Point the camera and lens to any difficult subject to be photographed, such as the shiny, smooth leaves of laurels or ivy, or even polished furniture; on looking at the ground glass we find the light reflected in patches, which, if a photograph were taken, would give a very poor representation of the original; the direct reflected light would come out as hard patches of white, causing a soot and whitewash appearance that would be very unsatisfactory; but place a Nicol prism in conjunction with the lens, and revolve it until its longer facial axis is at right angles with the principal direction of the incident light which is reflected to the ground glass, and it will be seen that a very large portion of this objectionable reflected light has disappeared. It is really totally reflected into the mount of the Nicol prism, and, if a photograph were now taken, the result would be precisely similar to the image projected on the screen, the hard patches of light will have disappeared, and the photograph would be a much more truthful portrayal of the original. It should here be noted that, although the reflections as seen by the lens are true to Nature, yet the photographic plate so enormously exaggerates them that the resulting photograph is anything but truthful. In copying oil paintings, this method will be found of the greatest service, as it is impossible in most cases to adjust the camera in such a position that reflections from the irregular surfaces of the brush marks will not appear on the ground glass, and finally on the sensitive plate.

Unfortunately, I have now to introduce a very big "but," and that is the great scarcity of really perfect large crystals of Iceland spar. Large prisms suitable for big lenses cannot be obtained for love nor money; perhaps the latter assertion must be modified, as Messrs. Baker, the scientific apparatus makers of Holborn, told me a few days ago that they had recently sold two Nicol prisms of about three inches in diameter for a sum of between 300*l.* and 400*l.* I should here say that I am indebted to Messrs. Baker for the loan of the rhomb of Iceland spar which I have used this evening for the purpose of illustrating double refraction. The moderately large Nicol prism that I have used in my experiments I obtained several years ago from Messrs. Newton, of Fleet-street.

Fortunately, however, there is another method of analysing polarised light, and therefore we are not dependent on such scarce and costly articles. We have seen that light may be polarised by reflection from polished surfaces as well as by refraction with Iceland spar, and, if we place a mirror in front of the lens in a suitable position, we are able to produce all the phenomena of extinguishing reflections quite as satisfactorily as if we used a Nicol prism; and, although this gives what is known as a reversed negative, it will, doubtless, be hailed as a boon by a large portion of the numerous photographers, both professional and amateur, who are now taking up the carbon process, as prints can be made from such negatives by the exceedingly simple single transfer process that give all the parts of the picture in correct relation to each other just the same as if a double transfer print was made from a negative in the ordinary manner.

The reflector should be so adjusted that it can be rotated round the lens, that is to say, that it may receive the image from above, below, or from right or left of the axis of the lens, and also that it should be hinged so that the angle formed by the reflector and an imaginary line drawn through the axis of the lens may be increased or diminished according to the direction of the incident rays which are reflected from the objects to be photographed.

As an example, suppose it be desired to take a photograph in a deep wooded glen, the principal direction of the incident rays which are reflected from the foliage, &c., will be from above, then the mirror should be placed below the lens and the camera sufficiently tilted to take in the view. If, instead of being above, the light incident to the objects to be photographed is from the right or left, then it may be necessary to place the reflector on one or other side of the lens.

A silvered mirror does not seem to answer the purpose very effectively, but I have found for photographing the difficult pale cirrus clouds on a blue sky that a black-glass mirror gives the most remarkable results, and I have also obtained striking results in photographing foliage in this way.

It will sometimes occur that the reflections that it is desired to obliterate are not at the polarising angle, and so are not amenable to either the Nicol prism or the reflecting mirror; in such cases I have employed both mirror and Nicol prism, that is to say, mounting both in front of the lens, polarising the light with the mirror, and then analysing it with the Nicol before it reaches the plate. In this way, with care, some excellent results may be obtained; but by this method it is possible to cut off nearly all the rays reflected from the object, hence a very long exposure would be required, but, by carefully adjusting the relative position of the reflector and Nicol, almost any desired result may be obtained.

MR. ANDREW PRINGLE ON "LANTERN-SLIDE MAKING."

At the Woolwich Photographic Society, on April 26, the President (Rev. S. E. Chettoe) in the chair, there was a good muster of members and friends. Among the visitors were some members of other photographic societies, who were present in response to an invitation sent to several neighbouring societies. This pleasurable circumstance may be just the starting-point for a closer union between the societies concerned, and will tend to make the Affiliation scheme more of a reality.

The Chairman, in a brief speech of welcome, introduced Mr. Andrew Pringle, who then proceeded to address the meeting on the subject of *Lantern-slide Making on Gelatine and Collodion Plates.* In course of the address, Mr. Pringle said:—

"It is essential that there should not be a mass of black in a lantern slide, there should always be a complete scale of gradation. The tone or colour is another important point. Some affect a tone which is neither warm nor cold, and consequently you see a very dirty tone. I do not recommend albumen plates, unless the worker can devote his whole time to them and wishes to incur the displeasure of his wife; but it is the best process. Wet-collodion plates will give clear high lights, but they are not so good for keeping the shadows clear. The dry-collodion process I recommended to you is well adapted for contact work, and keeps the high lights clear. The collodion process is useful for reductions, albumen is not. If you wish for warm tones, you must give long exposure and prolong the development. I don't recommend dry collodion for cold tones. Gelatino-bromide plates do equally well for reduction or contact for warm and cold tones, but for all that, gelatine is not such a good menstruum as collodion. In selecting the negative, it must be remembered that you cannot get a first-class lantern slide from a second or third-class negative. If you want a medal-taking slide, you must use a plucky negative; don't try with a soft negative, although such a negative may give you a good print. You might be able to get a good slide from such a negative on the Hill-Norris collodion plate, and then give long exposure, and use a restrained developer. The developer for gelatino-bromide plates is ferrous oxalate for cold tones; it cannot be beaten. I keep the stock solution saturated in a couple of sweetmeat bottles. The iron solution is acidified, and I keep both at 60° Fahr. Shake up and filter just before use. In mixing the developer, I prefer one to six, or one to eight. The development should be deliberate. The Kent water is not a good water for the purpose of washing, and causes a scum of oxalate of lime to appear on the surface of the plate, but it is easily cleared. In another sweetmeat bottle containing a solution of alum I add a drachm or two of hydrochloric acid—I am not particular as to quantity. Plates immersed in the solution are soon cleared. Over-exposure is shown by the greenish appearance of the image, and, of course, under-exposure is known by the hard black tone. An easily restrained developer should be used for warm tones. I do not recommend metol and amidol for lantern slides, and I pass over those. Suppose a beginner wants warm tones the best thing to do is to keep on exposing on one or two negatives until he obtains two good slides, and then he will be in a position to judge the quality of negative required. Every lantern slide is improved by putting it in the clearing bath; wash the plate well, but don't overwash, and always varnish the plate."

A number of slides were then passed through the lantern, enabling Mr. Pringle to point out certain defects to be avoided, such as chalkiness, opacity in the shadows, tone, &c.

Several questions were put to the lecturer and answered; but, although Mr. Pringle invited the audience to question him, yet they seemed rather backward in taking advantage of the offer.

A vote of thanks was proposed by Colonel C. D. Davies, and seconded by Mr. W. H. Dawson in cordial terms, and was heartily endorsed by all present.

Mr. Pringle responded.

The remaining business was of the routine character generally. Before the members separated arrangements were made with the Hon. Secretary of the Leytonstone Camera Club for a combined camera outing, to take place in June, and will be conducted by members of the Club mentioned. Later on the Woolwich men will return the compliment, and will do their best to afford their friends a pleasurable outing.

COPYING.

COPYING is a branch of photography which receives, as a rule, far less than its adequate share of attention.

The majority of photographers deem copying as far beneath their notice as the average artist would deem signboard-painting; but still copying has to be done, and, such being the case, I can personally see no reason why it should not be done *well*.

If a portrait is brought to be copied, the general thing is to put it on one side for a few weeks until some five or six others have arrived to keep it company, and then to slaughter the lot in a batch. I use the word "slaughter" advisedly, for I can think of no other that will adequately express the general mode of dealing with copies. They are stuck up one by one before the lens, and focussed fairly sharp; a plate is put in the dark slide, and an exposure is made; then the negatives are developed. Some are, perhaps, a little under or a little over-exposed. "Never mind; they are only copies," so they are passed, and down they go into the printing room. If the retoucher sees them at all, all he has to do with them is to see if they require spotting, as it would be looked upon as so much waste of time to retouch copies. The same careless mode is carried through the printing and finishing processes. "Here's some paper discoloured." "Oh, well, use it on the copies!" If any paper has been torn too small, if it contains iron spots, or has any other fault, it is still considered good enough for copies. What matters it if half a dozen prints are toned as many different shades if those prints be copies? And, as for mounting, any old cards are considered good enough. The result of all this is that the customer (client) grumbles, and does not think the pictures good; the photographer tells him or her that copies never are, unless they are enlarged and worked up in colour. Needless to say, he does not often get the order to do an enlargement, the copies having settled that for him.

Now, there is really no reason whatever why a photographer should not pay special attention to this branch of the art, and make for himself a name as a specialist in copying. If proper care be exhibited in the various manipulations, there is not a picture that cannot be made to yield a result at least as good as the original, and in nine cases out of ten far better. There is almost as much art in lighting a picture for the purpose of copying as in lighting a living subject, and great care should be used in giving a correct exposure. The retoucher should be instructed to pay special attention to copies, and to give them at least half as long again as original negatives. The printer should also be requested to give copies a little extra care to vignette, mask, or print out where necessary, and the result will be that the customer will be more than pleased at the result, will tell you that he never expected anything like such a good picture, and with very little persuasion will be induced to order an enlargement.

Under the general head of copying must be included slight enlarging, such as from *carte-de-visite* to cabinet, and wherever it is possible this should be done from a transparency; where the original negative is not obtainable, and the enlargement has to be made from a print, an extra hour's work must not be begrudged in the retouching. To produce the best results time must be expended, and, as time is money, it follows that the production of good pictures costs more than the production of those that are mediocre. Let the cost be double or treble, it will be found to pay in the long run, and I trust it will soon be a general thing to see on photographers' price lists, and in their show cases, a line reading—"Copying a speciality." In the case of a very bad original I have known it pay to have the first copy worked by an artist, and then to copy it again.

Of course, there are pictures sometimes brought to be reproduced that are so bad that it is an absolute impossibility to obtain anything at all decent from them. Such as these should not be undertaken at all, as they will only tend to spoil the advertisement obtained by some dozen really good pictures. A good business head is required in the reception room in taking orders for copies—some one who can understand exactly what can be done and what cannot. Never reject a copy unless it is an impossibility, and never turn out one one unless it is an improvement on the original.

C. BRANGWIN BARNES.

THE LANTERN IN NEW SOUTH WALES.

THE Victoria correspondent of the *Australian Photographic Journal* writes:—"The lantern is daily (or nightly) becoming more extensively used to illustrate lectures. Even the lectures which Mr. J. Hotson, of 'frozen mutton' notoriety, has delivered in different places in connexion with the establishment of the frozen meat export trade have found that the lantern is a 'lubricant' which enable the people to more easily swallow and assimilate their facts and details. The views shown have illustrated the Newport freezing works inside and outside, and also the machinery, freezing, storing, and other chambers in the new metropolitan markets in Flinders-street.

"*Apropos* of lantern work, one of our most experienced lanternists had, a week or two ago, a rather unpleasant experience. Apparently with the contempt or carelessness which is bred of familiarity, he omitted to test the tubes on the evening in question, and suspects that the pipe leading from one of the retorts to the gas-holder had become choked. Be this as it may, something was wrong, for an explosion took place, the retort being rent by the force of it, and so much damage was done to the surroundings that the Exhibition was postponed and the audience retired.

"The ether saturator is having a good innings just now, thanks to the form in which it has been placed upon the market by Mr. A. Gunn, who was the first to make the three-barrel saturator an article of extensive use. This form of saturator has a gas way of between three and four feet, the inventor claimed that complete saturation of the oxygen was attained by it. Since he brought it out, however, we have had introduced successively four and six-barrel instruments, and we do not know yet whether finality has been reached. In consequence of the bad name obtained in England by the ether saturators, many experienced lanternists still object to use them, while those who never heard anything of lime-light until they saw the three-way one adopted it at once, and have had great success—another instance of the old proverb, 'Fools rush in,' &c.

"In this case, however, the 'fools,' so called, have the best of it; for they have been having the use of the instrument, while the others, who consider themselves wiser, were worrying with methylated spirit and oil when they were removed from a gas supply.

"I think that the saturator obtained its bad name in consequence of the construction of the English form of it. The tank form of saturator was undoubtedly a dangerous instrument to place in the hands of any but those of great experience, and even then were not always safe.

"With stuffed saturators, the first of which was the two-barrel instrument of Ives, no such danger exists; and I believe that this form is destined to do extensive work in the colonies. It has effectively doomed the oxycalcium or spirit jet for the limelight."

THE MAKING OF STEREOSCOPIC TRANSPARENCIES.

[Amateur Photographic Association of Victoria.]

No one who looks at a stereoscopic transparency upon glass, alongside a print on paper from the same negative, can fail to note a great difference in favour of the transparency.

When the latter is examined, no disturbing element in the form of irregularity of the surface of the paper exists; no confusing reflections from a burnished surface are seen; the details in the deep shadows are apparent, and the highest lights are much more intense than the corresponding portions upon paper, for, in consequence of the light being transmitted direct from the source of illumination, instead of being reflected second hand from the surface of the paper, the amount lost is very small. Charming as the ordinary stereograph is, it appears tame when compared with the brilliant transparency, and, in order to try and induce those who already practise stereoscopic work, and who may not yet have essayed the production of the transparencies, the following details of the work so practised by the writer are given:—

The only drawback to the making of the transparencies is the need of a specially made printing frame (that is to say, if the greatest ease and certainty are sought), unless they are made by means of the camera. The method of making them by contact is, however, the most expeditious, and is recommended.

The printing frame is made with a solid front, the sides and ends are about half an inch thick, and form a complete frame in themselves, an opening, slightly longer than one-half of the stereoscopic point, is formed in the centre of the front, so that, so far, the frame appears like a very shallow box without a lid, and having a small square aperture in the bottom. The whole of the inner portion of this box is considerably longer than the negative to be operated upon, in order to allow for the adjusting of it, and also for the transposing of it during printing. Adjusting screws are fixed in the two ends, and in one of the sides, and these bear against slips of glass cut parallel, and, say, about a quarter of an inch wide, their thickness being about equal to the general thickness of the negatives used, though this is not material so long as they are not thicker than these negatives. By advancing or withdrawing these screws, the negative may be moved to any position required, so that only that portion which is needed is brought into the central position for printing from.

A metal frame of the exact size of the inside of the printing frame is now prepared; this must be absolutely flat, of about the same thickness as the glass on which the transparencies are to be printed, and having an aperture of rectangular form in the centre; the size of this aperture is regulated by the size of the plate upon which the transparency is made, and must be obtained by calculation.

This frame is then covered on one side by a piece of very thin but perfectly opaque paper, and in the centre of this paper is an aperture of the exact shape and size that one of the prints of the stereograph is wished to be.

In operation, the negative is placed face up in the printing frame or box, the metal frame covered with paper is then dropped into the frame on top of the negative; the whole is now held up to the light, and the negative brought into position by means of the adjusting screws, the right-hand side of it being pushed as far to the right hand of the printing frame as the slips of glass, against which the screws work, will allow it to go. When all is ready, the transparency plate is placed face down inside the metal frame, and placed close up against its left-hand edge, absolute contact with the negative being prevented by the paper covering, though this does not prevent a sharp image being obtained. The back is then put in (this may be of one piece of wood, secured by a couple of buttons), and the frame placed in position for exposure. The exposure is made by means of an inch or two of magnesium ribbon, at a distance of, say, twelve inches from the negative. Daylight can, of course, be used if the plates are sufficiently slow to allow of it.

The exposure over the back is taken off the frame, transparency plate lifted out, and the negative moved along the printing frame under the paper-covered metal frame, until it is stopped by the glass slip at the left-hand end of the printing frame. The transparency plate is then replaced, but this time kept in contact with the right-hand end of the metal frame, the back fastened down, and the second half exposed. This all appears very complicated, but in practice a negative may be adjusted, and the two exposures made from it in less time than it has taken to write this description.

The developer used may be pyro-ammonia, quinol and soda, or ferrous oxalate, the proportions will be found accompanying the plates. The fixing, masking, and mounting are the same as for lantern slides.

The masks are cut from opaque paper, and have two openings, the centre of which are from two and five-eighths inches to two and three-quarter inches apart (not more, or too great an effort will be required to subsequently combine the two pictures, and the eyes will be strained).

A clear glass cover is next applied, the edges bound in the usual manner, and (if the slide has been made on ground glass) the transparency is complete.

Transparency plates of the correct size are now to be obtained both in Melbourne and Sydney, and the price is reasonable; if on ground glass, so much the better, as, though it adds slightly to the cost of the transparency plates, it saves the weight as well as the expense of an additional glass, and three glasses render the slides somewhat heavy.

J. H. Harvey.

ADVERTISING ON THE CLOUDS.

About twelve months ago, it may be remembered that we devoted some attention to more than one scheme afloat in this country for projecting, by means of the electric light, advertisements, or signs, upon the clouds, However, since such time, says *Invention*, we have heard nothing further. in a practical way, of those celestial advertising projects; indeed, many will rejoice if they have died a natural death, never to be revived in our midst. On the other hand, our enterprising and energetic relations on the other side of the Atlantic have not allowed the principle to sink into chaos or slumber, for we learn that a big "cloud projector" has been installed for some time past on the summit of the lofty "World Building" in New York City, and from which situation it is operated with satisfactory results; indeed, we learn that the device has already attracted much public attention, which obviously is the aim of the scheme. The Americans are a wonderfully practical people and everything, including nature, has to take "a back seat" in favour of the "almighty dollar," begetting resources of the people. Now the expanse of the heavens is turned to such account. This monster electric magic lantern, mounted on a ball bearing, weighs, we believe, some 3,500 lb, and is of similar design and construction to a naval searchlight or electrical projector, having an illuminating power of some 1,500,000 candles. The lens is about eight inches in diameter, and stencil-plate slides are employed for throwing the desired words, figures, or signs, upon the clouds. On clear nights the apparatus can be utilised for projecting advertisements upon buildings in the locality. We learn from an American contemporary that the inception of the idea at issue emanated from Mr. L. Rogers, of the General Electric Company, in 1892, who about this date installed a huge electrical projector upon Mount Washington, visible at night for a distance of some 140 miles, Mr. Rogers realising that with this great arm of light it was possible to actually touch any house, tree, or spot of ground within range of vision, it was sufficient to make one feel that electricity was, indeed, far-reaching in its results. Again, as it became dusk, the operator on this tower realised that hundreds of thousands of eyes were centered upon that one single spot, watching for the flash or wink of that "great luminous mountain eye" which had recently come among them. Numbers of letters received daily at the time the light was in operation testified to the fact of its universal interest and its intense power.

It was during the operation of this light, in the summer of 1892, that Mr. Rogers began, we learn, to study the clouds, and to invent some method of casting legible lines upon them. Subsequently, at the end of the Mount Washington season, in October, he removed the light and electrical apparatus to Manchester, N.H., where it was installed on the top of a prominent building in the centre of the town. Mr. Rogers then began experiments of throwing images long distances, which, we are informed, resulted in the practical cloud projector, which is now located on top of the World Building in New York. These early experiments were, we gather, attended with the greatest difficulties, and were, for the most part, very discouraging. The first idea was to adopt the lines already laid down in magic-lantern processes. It was soon learned, however, that condensing lenses were entirely impracticable. The largest condensing lenses that could be obtained were fourteen inches in diameter, and, as the beam of light that would strike them was thirty inches in diameter, it was obvious at once that special lenses would have to be constructed for this work. As great intensity of light was the first requisite, it was at once seen that condensing lenses, and therefore the old magic-lantern formula, would have to be abandoned.

After considerable experimenting, we learn, the cone of light was obtained by changing the position of the arc lamp and reflector as related to each other. The greatest distance which perfect images or legible lines had been thrown up to this time was eighty feet, and this had been done with condensing lenses, or the common magic lantern.

It was ultimately decided that there should be several lenses through which the beam of light should pass, besides passing through the lantern slide. It was also then surmised that the outer lens should be some considerable distance from the inner lens; but just how far it was absolutely impossible to tell, except from actual experimenting. Certain lenses were procured, and after the cone of light was established the lantern slide and inner lens were attached to the front of the projector, the outer lens being held in line by some one on a ladder. Experiments were carried on in this crude manner slowly during the winter of 1892, and enough was ascertained to convince Mr. Rogers that it was possible to accomplish the feat desired. The unevenness of the screen was found to be no objection whatever. A letter, part of which was on the branches of trees, the other part on a hillside quite a distance beyond the tree, appeared, it is said, as a letter upon a plane surface to the eyes of the beholder. Words put upon the corners of buildings also appeared as though thrown upon plane surfaces.

The light, we are told, was next moved to the top of the Grand Opera House, Boston, Mass., where it was run as a searchlight during part of the evening, and where the experiments were continued each week, or perhaps month, bringing some slight improvement or some known fact to add to those already obtained. It was here that the first defined ring of light was put upon a cloud. This fact had definitely decided the matter in Mr. Rogers' mind, and he thereupon determined to construct apparatus which would be adjustable in all directions, and which would maintain the outer lens in a perfect alignment with the lantern slide and the other lenses, regardless of to what point of the earth or heavens it was directed.

The new apparatus was then moved to Chicago, and placed upon the roof of a high building. With this apparatus and with the lenses which had been constructed under Mr. Rogers' direction, words and pictures were, we learn, for the first time in the history of the world, thrown upon the clouds. During the succeeding month or six weeks a number of Chicago parties were invited to witness this cloud projector operate. A Mr. Sperry then designed the large steel structure which is at present on the roof of the New York building, and which is, we believe, the only structure of its kind.

It will be observed, remarks the *Electrical Review* of New York, that these projections are obtained by entirely new processes, and not by the well-known magic lantern, by which the throwing distance is decidedly limited. The outer lens is of a very long focus, and from this fact any unevenness in the screen does not render part of the image blurred, which is the case with short-focus lenses. Therefore, adds our contemporary, when the head of Cleveland is on the clouds, his mouth may be upon downy vapour, his cheek upon unresisting raindrops, and his brain in a surging mass of dark evil matter, while to the eye of the world his picture is presented as a calm, every-day individual.

The clouds may be tossing and tumbling in a veritable gale of wind, and yet any character thrown thereon will appear to those below just as if the image were thrown upon a solid white screen.

MONTHLY SUPPLEMENT

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THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

Messrs. W. E. Baxter, Limited, are passing through the Press a cheap edition of *Photo-Micrography*, from the English edition of the work, *The Microscope: its Construction and Management*, by Dr. Henri Van Heurck, Professor of Botany and Director at the Antwerp Botanical Gardens, late President of the Belgian Microscopical Society, Hon. F.R.M.S. and New York M.S.

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Apropos his article on "The Incandescent Light in the Lantern," which appeared in the Lantern Record of last July, Mr. C. Ray Woods, of the Royal Observatory, Cape of Good Hope, writes: It may interest you to learn that Mr. Rudd had a lantern constructed to carry the Edi-Swan focus lamps. Provision was made for ventilation, but, to prevent heating of the woodwork, the space between wood and lining was lined with asbestos. A prolonged trial of the 200 candle-power lamp heated the glass bulb to melting point, and air was sucked in, so Mr. Rudd now contents himself with the 100-candle lamp, which is good enough for private exhibitions, and more than equal to oil. An incandescent lamp arrangement for public exhibitions has yet to be accomplished."

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On another page we give an outline description of the stereochromoscope, the invention of M. Nachet, of Paris. This is a modified stereoscope by which positive photographs of objects are not only viewed in relief, but also in their natural colours.

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Lantern plates are extensively used by photo-mechanical firms instead of the so-called photo-mechanical plates, or other kinds of plates supposed to be suitable for giving the best results for reproduction purposes.

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Our contemporary, *Science Siftings*, recently endeavoured by means of a plebiscite of its readers to ascertain which were the most popular photographic specialities. The competition has just been decided, with the result that Ross lenses, Ilford dry plates, Kodak hand cameras, Thornton-Pickard shutters, Ilford printing papers and pyro (Schering and other makers) developers are most in favour.

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Those who have seen the lantern slides made by Mr. A. Brooker of Hastings will recognise in them great beauty and technical merit of production. This gentleman has condensed his knowledge of lantern-slide making into a small pamphlet, *Lantern Slides on Dry Plates*, issued by the Britannia Works Company, Ilford. It is tersely written, and the instructions, though brief, are clear and sufficient, and by following them the production of good lantern slides is assured.

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On the question of masks, Mr. Brooker has the courage to defend the now unfashionable circle. Here is what he says on the point: "On one occasion, when the writer was giving a lantern lecture at one of the principal London societies, one or two present, who had evidently given attention to the subject, were kind enough to say, the only fault they had to find was with the masks used, particularly objecting to the round shapes, and endeavouring to strengthen their objection by saying that one never sees a round picture when looking at a landscape; also that painters seldom paint round pictures. Now, lantern slides that have to be successfully projected on a screen are entirely different from paintings, which are usually hung each in a position of its own on a wall, so we need not discuss the latter remark, except to say that painters have frequently painted round pictures. The former objection may also be dismissed by the statement that the view presented to the gaze of a person viewing a landscape generally takes the round or, perhaps more correctly, the oval form. So we can very well dismiss these grounds of objection, and proceed to select the mask *which is most suitable to the slide for which it is required.* Suffice it to say that, in a lecture series, greater uniformity is secured by having all the masks of one shape, whichever is selected, and the negatives should be prepared with that object in view. The circle or square cushion appear to be the most suitable for general use, but for odd slides various other shapes may be very useful, particularly where there are objectionable or defective portions which it is advisable to mask off, and, for obvious reasons, where the perpendicular lines of a building are not quite true, it is better to use a circle or oval mask than a rectangular one."

* * * * *

The Eastman Company have lately introduced a new folding Kodak, taking a picture $6\frac{1}{2} \times 8\frac{1}{2}$ inches. This Kodak embodies all the latest and most advanced ideas in camera construction, and is a duplicate, except as regards size, of their new No. 5 folding. Several new features have recently been introduced in the "folding" Kodaks, amongst them being an iris diaphragm shutter, worked by hand or pneumatic tube, having automatic range of exposures from $\frac{1}{100}$ of a second to three seconds; double swing back; rising and sliding front; falling front board, to prevent view from being cut off when wide-angle lenses are used. The lens can also be instantaneously detached, and wide-angle, short-focus lenses immediately substituted. Stereoscopic lenses and shutters can also be immediately attached to the 5 and 6 folding Kodaks. A new and simplified method of setting the shutter for time exposures has also been brought into force in the No. 2, No. 3 Regular and Junior, and No. 4 Regular and Junior Kodaks.

A VIGNETTER FOR ENLARGEMENTS.

Most amateurs and others who are not regularly engaged in enlarging find the process of vignetting a more or less troublesome one, and the results attained are not always of as satisfactory a character as might be wished. The ordinary method of vignetting by hand by means of a piece of card with an aperture of suitable shape held between the lens and the sensitive paper is all very well when constant practice has developed the necessary skill, but for the novice or merely occasional worker it presents few attractions. Many amateurs of my acquaintance have essayed the use of vignette glasses in contact with the negative, but the gradation obtained with these is even less satisfactory than that given by them in ordinary contact printing, while, in addition, I question whether they do not interfere with the definition of the picture.

During several years past I have used, not only for enlarging, but also for the production of vignetted lantern slides, a variety of mechanical contrivances, by means of which the vignette is not only held truly in position, but can be so accurately manœuvred while in use as to give any kind or degree of gradation or softening, and, what is perhaps of more importance, enables precisely the same result to be obtained in repeated exposures. Nothing can well be less pleasing to the eye than a number of vignette enlargements being in close proximity, some of which possess a softness of gradation extending to nearly the margin of the picture, while others present an appearance differing but little from a blurred mask. Yet such is too frequently the result produced by the hand method.

I believe some of these mechanical arrangements have been previously described, but the following is the simplest I have ever used, is equally applicable to the lantern or to daylight work, either with a camera or in the enlarging room, and is, moreover, within the capacity of any amateur mechanic to construct for a shilling or two at the outside.

It consists simply of two wooden frames or tubes sliding one within the other, after the manner of the old wooden-bodied camera, or, if preferred, the bellows system can be substituted. A baseboard must also be provided, similar, again, to that of the old-fashioned camera, upon which one or both of the tubes can be moved and firmly fixed in any desired position, and some means, such as a rack and pinion, screws, or lever, should be provided, in order that one portion of the arrangement may be moved backwards and forwards through a short distance during the time the instrument is in use. The portion so moved is provided at the back with a frame the size of the largest negative employed, in which the vignetting mask is fitted; in fact, an old wooden-bodied camera, with the ground glass removed from the focussing frame, will fulfil the requirements perfectly, and accurately describes the instrument.

As regards dimensions, the vignetting frame will depend, as just stated, upon the size of negatives used, as, in order to avoid the necessity for "unshipping" the vignetter when a picture is to be printed out to full size, it should not be smaller than the negative itself, or it may be preferably a little larger. The length of the tubes should be such that, when pushed one into the other or closed, they do not greatly exceed the equivalent focus of the lens employed for enlarging, and when extended to their fullest they measure about double that length. This is, perhaps, longer than is absolutely necessary in ordinary work, but it will enable the instrument to be employed for any purpose, from copying same size as the original to any degree of enlargement, although for enlarging only two-thirds of the extension will be ample.

In use, this arrangement takes the place of the moving mask usually worked by hand, and is to be fixed in position in any suitable manner, according to the particular purpose for which it is to be employed. The open end or front is placed towards the lens so that the latter projects a short distance into the tube, and the vignetting mask is fixed in the back frame, and adjusted at the proper distance by sliding the two tubes in or out.

With regard to the preparation of the mask and fixing it in position, the following is my plan. It will be understood that the vignetting frame is arranged centrally with the axis of the lens, and corresponding with the centre of the enlarging easel. The mask is made by tracing an opening the exact size of the vignette to be made—that is to say, by following the outline of the figure tolerably closely, or else by making an oval, pear-shaped, or other opening precisely as if it were to be used for ordinary vignetting, the edge being *slightly* serrated or not as may be preferred.

Now, if such a mask be placed in the frame already described, and adjusted at precisely the same distance from the lens on the enlargement side as the negative is from it on the other, it will cut off all the rays of light except those passing through the portion of the negative representing the opening; but, except in copying the same size, when, of course, it would be in contact with the sensitive plate or paper, it will be much out of focus, and will not show a sharp line, although the want of sharpness may not be sufficient to constitute softness of gradation. In order to bring this about, by means of the rack and pinion or other attachment, the position of the mask is altered sufficiently to produce greater softness, or, what is far better, by the same means it is kept in gentle motion between two ascertained points while the exposure is being made. The degree of motion necessary to give the desired softness can easily be ascertained by examining the image on the focussing screen, and the limits of the movement marked upon the baseboard of the vignetter, when a precisely similar result will always be produced for the same degree of enlargement.

It will be observed that the size of the mask is invariable for every degree of enlargement, but its position is altered in the same manner as that of the lens with regard to the negative. It may be mentioned also that the greater the degree of enlargement the greater will be the softness of gradation when the screen is in normal position, and the less variation of that portion will be necessary.

The fixing in position of the whole affair will depend upon circumstances; with the lantern it may simply stand upon the same table, while with daylight arrangements it is easily made to form part of the focussing arrangement.

W. B. Bolton.

LANTERN MEMS.

The optical lantern was well to the fore at the Royal Society's *soirée* on May 2, for not only was an electrical lantern employed as an illuminator for the magic mirror, and for the regular photographic projections, but limelight apparatus were used for micro-photography and experiments in persistence of vision, and for producing monochromatic light of any desired wave-length.

* * * * *

To take the magic mirror first. It was shown that the Japanese type of mirror, which, from an apparently smooth silvered metallic surface gave an image on the screen (by reflection) of the raised metallic figures or pattern at the back, was due to by-products in the process of manufacture, which affected the molecular structure of the metal, not apparent to the eye when viewed by direct vision after the surface was polished, but detected when a strong light impinged on the surface and was reflected on a screen.

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Mr. J. W. Kearton exhibited some English magic mirrors, which were made by producing figures in relief and intaglio by the action of suitable acid (nitric), and then polishing away until they disappeared to direct vision. He explained that they owed their peculiar properties to the curved elevations and depressions in the polished metallic face, the elevations producing figures in shade on the screen by the scattering of the light, while the depression produced figures in light by condensing rays reflected from the mirror. Among the interesting designs shown may be mentioned a very effective one for contrast and definition—a spider and web.

* * * * *

By placing a convex lens over the mirror the reverse effect of the design was produced, viz., the part of design previously in shade was light and the light part in shade. The Japanese mirrors—which, I believe, can be purchased cheaply in Japan—are not a commercial article with opticians in this country; but the interesting nature of the projections from the reflecting surface is such that lanternists will do well to add one to their collection of exhibits if they come

across one, for, supposing they take the trouble to make any on the plan suggested as "English magic mirrors," they will be of great interest for contrasting the effect from their stamped-up back with that of the etched surface of the English type.

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A MOST beautiful instrument was that exhibited by Mr. A. E. Tutton, for by its means the whole field of any polarising goniometer, or any instrument of that class, employed for measuring angles of crystals, could be evenly illuminated with pure monochromatic light, the gradations of colour being so complete that any desired shade could be obtained and registered on a divided circle, the graduations corresponding to the passage of light of known wave-lengths.

* * * * *

THE apparatus for photo-micrography and stereo-photography seemed very ingenious and capable of being employed for various optical experiments, while the power of focussing, independent of the position of the microscope, must facilitate manipulation considerably. I could not help being struck with one thing as a lanternist, that the limelight employed for the illumination of the object for projection on the ground-glass screen of the camera was regulated or adjusted direct from the cylinders, notwithstanding the cylinders were fitted with automatic regulators.

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I SHOULD not mention this matter, but it is not the first time I have come across instances where the use of the compressed-gas automatic valves have not seemed to be understood, the jets having been used with the taps full on, and the gas regulated from the cylinder, the same as if no automatic valve was used. As I understand Beard's regulator and others of this type, the gas can only be delivered at the pressure to which the spring of bellows has been set, and, whether the pressure behind is quite sufficient to keep the bellows fully charged as used, or much in excess by the cylinder valve being unduly opened, no more gas is available than would be the case if it was used as designed to be, viz., by regulation of the taps of the jet; in fact, the same as if the gas was coming from a gas bag, as in olden days.

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THE comfort in working an apparatus with an automatic regulator, against one worked direct by the valve of the cylinder, is known to the majority of lanternists, and it may seem superfluous for me to remark upon it; but, having seen and heard of these cases, I feel there may be other lanternists who read these pages that also do so, not having when purchasing the regulator any practical lesson or printed instructions.

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THERE are so many points in scientific apparatus of the present day where one in using same can go wrong, and, although the makers and distributors do all in their power to make it clear, printed directions on the care and use of various details would often be of the greatest value to amateurs and others whose time for recreative science is limited. I have seen over and over again men, clever in other walks of life and professions, quite non-plussed at a simple manipulation which, to those used to it, seems decidedly easy; and therefore I say to all manufacturers, Never mind the risk of telling nine out of ten something they already know if you can make the whole matter clear to *everybody* (necessarily including the tenth).

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TEXT-BOOKS are too often written on the assumption that the reader knows as much as the author, and so, while not perhaps going quite as much into detail as a drill book does for a soldier, yet I should say that "instructions and cautions" on those lines that at once appeal to the operator and user should be at hand oftener than is now the case.

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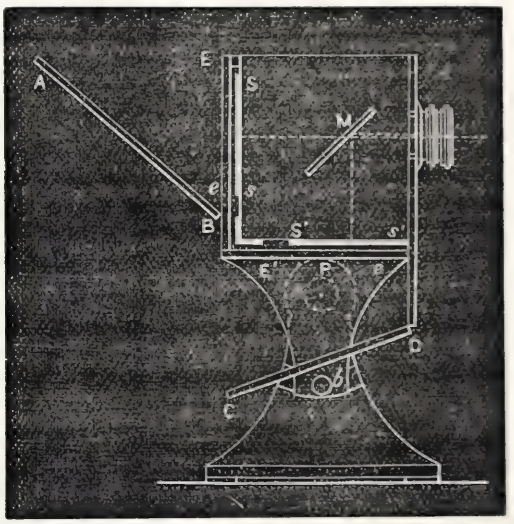
WITH summer-like days and light evenings, one does not look for many lantern entertainments; but, as one interested in the elevation of the optical lantern or its continued popularity, it is interesting to read in the daily papers that Mr. Palette, or some other artist, illustrated his lecture on caricatures, and Mr. Baritone, or other singer, gave an illustrated musical entertainment by the aid of dissolving views and photographic representations. Lessees of halls, pier pavilions, and others recognise the fact that good lantern entertainments are an attraction, and take care now to so arrange the room that it can be made reasonably dark, and thus suitable for projections from powerful limelight or electric-light apparatus, and yield good profit where properly carried out.

G. R. BAKER.

NACHET'S STEREOCHROMOSCOPE.

ACCORDING to M. Léon Vidal, who recently addressed the Société Française de Photographie on the subject, M. Nachet, the well-known Paris optician, has contrived a form of stereoscope which enables reproductions of objects to be seen stereoscopically in their natural colours. It consists primarily of an ordinary stereoscope, such as everybody is familiar with. The two stereoscopic images, placed axially to the oculars, are viewed by means of coloured screens, the one by a translucent red glass, the other by blue. It should be said that the positive chromograms are reproduced in the same way as is required for examination in the photochromoscope of Mr. Ives, that is, each one only reproduces certain colour sensations. It is necessary, in order that the synthesis of the colours should be complete and satisfactory, there should be a combination of three images, so that, in addition to the red and blue, it becomes necessary to have a green positive. Of course, the two vertical stereoscopic images have the same differences as regards points of view and inclusion of subject as characterise ordinary stereographs. The third image is placed horizontally in the base of the stereoscope at right angles to one of the vertical images. An opening in the base permits the light reflected from the mirror C D to traverse the green screen and the superposed positive.

Behind the prisms is placed a platinum mirror, which reflects the horizontal image on to the vertical image, so that the eye which looks through, say the right prism, sees two coloured positives, namely, the red and green and a combination of the two colours. The other eye, however, sees only the blue positive, but this, by reason of stereoscopic convergence, is superposed, as it were, on the other image, so that only one image is ultimately seen, and that in relief and in colours. The



above diagram will give an idea of the system employed. Essentially the stereochromoscope is a rectangular box of the usual type, carrying on its face two prisms forming the oculars. It rests on two supports, being pivoted at P, and held by the button P in the best position for receiving natural or artificial light on the mirrors A B and C D. M is the platinum mirror referred to, the positives are placed at S *s* and S′ *s*′, and the coloured screens at E *e*, and E′ *e*. The two images at S *s* in combining give the sensation of one solid image, and, as the images are seen against the coloured screens placed at E *e* and E′ *e*′, the combination of colours takes place at the same time. It will be seen by the construction of the stereochromoscope that it allows of the examination of four as well as three positives.

THE SEARCH LIGHT.

I am sorry to hear that, on account of overwork and ill health, Mr. W. Fenton-Jones has been compelled to resign the joint Honorary Secretaryship of the Central Photographic Club. I can personally testify to the fact that, since the Club started, Mr. Fenton-Jones has made great sacrifices of time and trouble on its behalf, and the success of the really excellent series of Friday-evening meetings that took place during the past winter was in no small degree due to his efforts. Mr. Fenton-Jones certainly deserves the cordial thanks of the members for his labours, and I hope his retirement from active work is only temporary.

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Mr. Charles Oakden, the other joint Hon. Secretary, fortunately continues at his post, and may derive encouragement in his labours from the fact that the appreciation of what he has done for the Club is in no sense inferior to that generally expressed at his former colleague's efforts. I hear that Mr. Charles W. Gamble (a good man) is to join Mr. Oakden in the Secretariat, and that Mr. F. T. Carter succeeds Mr. E. J. Wall in the Treasurership, the latter gentleman relinquishing his office by the doctor's orders. Mr. G. H. James and Mr. J. H. Avery join the Committee.

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With a membership of considerably over 200, the Central should have a good future before it. Attempts are to be made, I believe, during the summer to develop the social possibilities of the Club. So far as regular technical meetings are concerned, the months of June, July, and August will be left blank, and wisely so. The winter season will open in September, and already the Committee have their "eagle eyes" open for attractive items to include in the programme. It cannot be too widely known that the rooms of the Central Photographic Club are open till eleven o'clock at night, and innocent recreation in the shape of chess, whist, draughts, &c., is available.

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Numerical success and activity has, I am glad to observe, attended the recent meetings of the other mid-London photographic Societies. Quite the largest gathering of the season was noticed at the parent Society's meeting on Tuesday, May 22, when Mr. Henri Calmels demonstrated the fish-glue process of half-tone etching on copper, many well-known photo-mechanical workers being present. On the following night the Photographic Club had an exceptionally large attendance, when Mr. Arthur Burchett discoursed on the properties of his coloured screens, and showed some capital results therewith. Under the able guidance of my young friend, Mr. James A. Sinclair, its new Honorary Secretary, the Photographic Club, to quote an expressive phrase, is "going well and strong," and I hope, as I believe, that it will be long ere the geniality, good humour, and *camaraderie* that always mark its proceedings will be diminished.

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The London and Provincial Photographic Association at its last meeting had an attendance of more than fifty, late comers having to be satisfied with standing room only. Much useful discussion over various aspects of photographic work took place, and the proceedings were marked by entire freedom from restraint. On the whole, each of the mid-London photographic Societies possesses distinctive features of its own, which should greatly help the gregariously inclined photographer to gratify his particular taste in this description of intellectual fare. Summing them up, I should recommend the P.S.G.B. for those who like photography plus decorum and dulness; the Club for those who prefer it amid agreeably cosy and hearty surroundings; the "L. and P." for those who like to discuss scientific matters in a volcanic, not to say explosive, atmosphere; and the Central for those who have a hankering after a preponderance of the social element.

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Recently, when in Birmingham, I formed one of a large audience gathered to hear a lantern lecture, entitled *Twenty Thousand Miles with a Hand Camera*, by Mr. W. Tylar of that town. Chicago, New York, Salt Lake City, &c., formed the subjects of his camera pictures, and the lecture was full of dry humour and racy anecdotes, which kept his hearers in continuous laughter.

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Mention of Birmingham reminds me that Mr. J. H. Pickard, the well-known former Hon. Secretary of the local Society, and now one of its Vice-Presidents, who has done a great deal of work in connexion with the photographic survey of Warwickshire, has between one and two hundred slides made from the survey negatives, accompanied by a lecture and full descriptive matter, which he tells me he would be glad to lend to the principal London Societies for lantern exhibition. This kind offer will be worth while making a note of for next autumn.

Radiant.

ON CYLINDERS.

Ever since the accident at Bradford a few months ago, in which a boy dropped a cylinder upon a hard pavement, causing an explosion which killed the unlucky lad on the spot, lantern publications have, to a certain extent, gone mad on the subject of the safety of cylinders. No offence, Mr. Editor, I hope, since the mania has displayed itself less in the editorial columns than in those portions supplied by other contributors, and in the correspondence. With what result? The London Chamber of Commerce—a very estimable institution in its way, but one which seems, to judge by its actions, to be perennially in want of a job—holds a meeting, the gas-compressing companies make fresh regulations as regards the filling of cylinders, the railways throw obstacles in the way of the ready transit of gas bottles, and the poor gas-users, who neither get the prestige of calling a meeting nor the pecuniary profits upon extras in the way of annealing and testing charges, and who, after all, and beyond all question, run the greatest risks, have to submit to all these elaborate precautions to prevent something that has never occurred, and that in all probability never will occur.

Think for a moment of the improbability of an accident under the old arrangements. There must have been some thousands of cylinders in the United Kingdom in more or less regular use, and for years not a single accident occurs the blame for which can in any way be put upon their strength or their construction. Then a boy drops one, it explodes, the boy is blown to pieces, and, in consequence of this one solitary accident here, the users of the gas are harassed and compelled to employ, and to pay for, a lot of precautions against a kind of accident that is unknown, namely, the spontaneous explosion of a bottle. For the point upon which I wish to lay stress is, that there is no record—or, at any rate, I know of none, and shall be glad to be put right if I am wrong—of a cylinder, *under ordinary conditions*, exploding. All these elaborations of cylinder-testing and annealing are begun at the wrong end; the fact that, if a boy drops a cylinder, it explodes, is legitimate ground for condemning all boys of that make and refusing to allow any lad to carry a bottle of gas until the same has been duly tested or burst, annealed, and stamped, as a guarantee against all risk of his dropping it; but hardly is it a reason for treating the bottles in that way. It was the boy, and not the bottle, which took the initiative in that explosion. Is it not hard upon the users of gas that, because in several years one bottle, which was dropped upon a hard pavement, burst, they are to be put to such a disproportionate amount of expense and trouble as they have had to undergo? I may say, as far as I am concerned, that the Bradford accident no more induced me to look upon my oxygen bottle as a deadly thing than that unfortunate mishap a few years ago at the docks, when a cottage piano in a case fell upon a man and killed him, has led me to carefully avoid all cottage pianos.

The extent of the scare seemed to me to be out of all proportion to the danger it revealed, while the amount of inconvenience which it has caused to gas-users is simply incomparable to the risk the existence of which that accident was supposed to have indicated. Is it not time, now, that we realised once more that, with ordinary fair treatment—by which I mean that we should not treat a gas bottle any worse than we should any other piece of scientific apparatus—they are, whether made by one firm or another, to all intents and purposes safe, since, with such treatment, of all the thousands in use there is no record of a single explosion. The scare has been ridiculously fomented, and allowed to increase out of all proportion to its cause, and I would now suggest that it should be dropped. If I could have my way, I would revert to the exact state of things, as regards make and testing of cylinders, which were in force at the time of that accident, the ratio of explosions, under

ordinary conditions, to cylinders in use (0 : many thousands) being quite large enough to satisfy me.

One other point I would mention, the charge for annealing and testing. On the hypothesis that it is the user of the cylinder who is exposed to danger should it not be sufficiently strong, there is not a word to be said against making him pay for any precautions he may desire to be taken to secure his safety; but, on this supposition, no firm of gas-compressers has any right to insist on submitting his bottle to the operation and then charging him for it. I now see by a letter in your issue of May 11 that the compressers consider that it is they who are really exposed to danger in the cylinder trade, and not the users. If that be really the case, the compressing companies are in justice entitled to insist upon every cylinder passing through their test satisfactorily; but, then, they surely should not charge the user for testing or annealing, since it is done, not for his protection, but for their own. In making this charge the oxygen compressers are in a dilemma, that is to say, as far as fairness towards their customers is concerned; if they test for their own safety, they may insist on every cylinder being tested, but should be at the expense of doing so themselves; if it is the user who is exposed to what danger there is, then they should only test such cylinders as their owner may direct, in which case, of course, they would be perfectly fair in charging him for so doing.

In conclusion, I would repeat that the opinion that a great deal too much capital has been made out of the Bradford accident has been gradually forcing itself upon me; that accident to my mind simply indicates that it is not desirable to handle cylinders irreverently, but nothing more. It tells us that to drop a bottle of gas *may be* as dangerous as dropping a Winchester of nitric or sulphuric acid, although probably it is not. To quote the words of the manager of Messrs. Brin's Oxygen Co., Ld., in a recent letter in these columns "the long record of immunity from accident enjoyed by this Company" (which words apply equally well to all the British gas companies) "is the best possible evidence of the fact that proper precautions have hitherto not been neglected;" these words embody the whole of my contention, namely that we may be quite satisfied that proper precautions have been taken in the past, and, that being the case, I would strongly recommend all gas compressers to be satisfied with a degree of safety which, under fair conditions, there is every reason to suppose is absolute, and not to make every accident from causes quite beyond their control a reason for modifying regulations which have been perfectly satisfactory to suppliers and users alike. The safety which so long has accompanied the use of compressed gas in steel cylinders, is a high testimonial to the thoroughness and efficiency of the means adopted by Messrs. Brin and the other companies with that end in view; and, while I should favour every real attempt to improve those means when it is shown to be necessary, I think that there is a danger of misinterpreting the lesson taught by the Bradford accident, which had reference to the treatment of cylinders rather than to their strength or elasticity.

JAMES LEWIS.

SIMPLE METHODS OF PHOTOGRAPHING WITH THE MICROSCOPE.

[Philadelphia Pathological Society.]

THE praises of photography direct from the microscope have been already rung by men whose success in the employment of this means gives the best possible support to their claims of its value,* and the number of those who are using it is daily growing; yet there remain a large number of microscopists who fail to perceive its merits, or who regard the matter as lying outside of their field of work. They look rather scornfully at the best photographs of microbes or diatoms, over which photographic experts grow enthusiastic, and incline to regard as a failure any photograph which falls short of giving the conventional picture of the diagrammatic drawings of the text-books. Even when unprejudiced examination has shown the exquisite fidelity and the diagrammatic clearness which may be obtained by photography, they still regard it as the province of the photographic enthusiast rather than of the practical microscopist. One reason for this is that they rarely see direct photographic illustrations used in actual publication, since it must at once be conceded that the reproductive methods now available are far from satisfactory; but probably the most potent obstruction to the widening of the use of photography is the prevalent impression that good results are obtainable only at great expense of time and money. Men glance, for instance, into Sternberg's treatise, only to lay it down with a sigh because all this apparatus is unobtainable; and, overlooking all that may be said about simple or improvised appliances, they resign all thoughts of entering the field.

Such considerations long withheld the writer from essaying the attractive task, but a single demonstration, by Dr. Piersol, of the possibilities of work by lamplight, at once removed his misgivings, and opened up the matter to him, and later work has fully confirmed him in the view that there is no reason why any microscopist should not obtain photographic pictures surpassing the highest skill of the draughtsman, not only in their unimpeachable accuracy, but even in their schematic sharpness; and, as the demand increases for the direct reproduction of such pictures, there is every reason to believe that the mechanical arts will succeed in furnishing them with a perfection and a cheapness which no present method affords. It may safely be predicted that the time will come when photography will be employed to represent adequately all that the microscope can *show*, and that drawings will be needed only to demonstrate the points which *may be inferred, but cannot be seen*, in the preparation.

The two questions that most concern microscopists are: What apparatus is necessary in order to obtain good results? and, How may good photographs be gained with a practicable expenditure of time?

Let the beginner first decide what he especially wishes to photograph, and he will be wise not to choose the most difficult possible subject at the outset. Microbes that are almost beyond the highest resolving power of his instrument do not offer the most favourable opportunities for success, however attractive they may be in this "cocco-phobic" age—objects that are resolved rather by the brain than the objective had better be deferred until some experience has been gained. Low-power work—too generally neglected—with good, clear sections, well stained and thin, forms a more reasonable starting-point; and here apparatus of almost absurd simplicity will be all-sufficient. Some sort of camera is requisite; and, while it may be improvised, most men will do better to buy one of the many forms in the market, some of which are especially designed for this purpose. A "long draw" is a great convenience, since it permits of much choice in the amplification and size of the field, but it may be substituted by several cones of different lengths for uniting the camera to the microscope. These cones are easily made of pasteboard or any light-tight material, and constitute the only peculiar essential to photo-micrography. Any camera and any microscope thus linked together may be successfully used, and no great skill is requisite in order that the usefulness may be limited to no narrow field. Good objectives are, of course, essential to first-class work, and any defects in transparency, definition, correction for colour, or flatness of field, are apt to show in the results. But specially corrected lenses, like heliostats and other special appliances, are unessential, though valuable, and may be left to the expert who has unlimited time and money to devote to the matter, and aspires to the infallible conquest of every object which may be presented to him. The practical microscopist, who takes up photography not as an end, but as a means, will usually find that his stand and lenses are equal to his needs in achieving good, and perhaps the very best, results within a fair range of subjects.

As an illumination, sunlight is probably unapproachable, not only in its possibilities, but in the extreme simplicity of its employment. "But I have no day time to give to the work" may seem a crushing answer to that; yet there are few microscopists who, in the course of a week, could not find one hour of leisure while the sun shone, and one hour of sunshine well used may give thirty or forty exposures, with the possibility of as many good negatives. The north light, which serves so admirably for most microscopical work, must be abandoned in favour of a window into which the sun shines; and, in the absence of a specially adapted table, an inch plank, about six feet long by a foot wide, must be so adjusted that the sunlight shall fall upon the mirror of the microscope as it stands upon it, with the tube horizontal and connected with the camera. A vertical position is possible, of course, and may be compulsory in case the microscope stand has no joint for horizontal inclination, and some fluid preparations may perhaps be thus better managed. In any event, it will be found convenient to secure the camera to the board or table top by small blocks or buttons, and it can then be used in any position, and, when out of service, may be stood up in a corner. For powers under 100 diameters, the reflection of the sun by the plane mirror of the microscope, without any accessory apparatus, is all that is required—no condenser is requisite, and without it the heat rays need not be cut off by a blue cell. A mirror placed a couple of feet behind the ground glass of the camera (a standing toilet-glass answers admirably) is a great aid in adjusting the illumination, the field, and the approximate focus—then the fine adjustment is made with the aid of a magnifying glass. For this last purpose one of the microscope oculars, deprived of the eye lens, serves admirably, its

* Vide Piersol *Medical Photography*, Trans. Philad. Path. Soc., xiii. p. 243.

tube being just the right length to allow of accurate focussing of the rough inner surface of the ground glass. For very high-power work a smoother surface than is furnished by the ordinary ground glass of the camera is said to be requisite, but for moderate powers this answers perfectly. On either side of the true focus the image appears stronger and better defined than at the right point, because its outlines have an appreciable breadth instead of being mathematical lines—"where the image seems to melt into the ground glass" (Piersol) is the point of most perfect adjustment.

Unless the distance to which the image is projected is short, the arm will not reach the fine adjustment so as to allow of the necessary accurate focussing. Dr. Piersol's arrangement is, therefore, advisable—of a cord, with weights carried across the head of the fine adjustment screw (taking a turn round it, if it moves stiffly), and passing through rings on the base board, to be carried back along the edge, where it will always be within reach. A similar arrangement for the rack and pinion is rarely needed, since almost perfect focus can be made while standing by the microscope and looking in the mirror back of the ground glass. As this mirror allows in the same way of exact adjustment of the field to be photographed, no arrangement need be made to detach the microscope so as to search for this with the ocular. In photographing, an ocular may be used to increase the power, or an amplifier may be introduced into the tube; but the beginner will do better to work without either until he has learned to use his objectives by themselves, and has found them in need of such aids.

As to the exposure, use the slowest plate obtainable (such as Carbutt's A), as it gives the greatest latitude, and gives the shortest time that will afford a picture, vigorous development will then give a crisp negative with strong contrasts. If your negatives lack this quality, ask an expert photographer about them, or perhaps take him one or two to develop with you. The microscopist had better develop his own plates—any spare time can be utilised for it, and, if night time be chosen, any room, with only a red light in it, becomes a photographic dark room. But he had better have a dark room, if only a suffocating closet, since he can thus test at once the accuracy of his exposure, &c., and make another trial before changing his apparatus, if the first has not been satisfactory. A negative can be covered up light-tight in its developing pan, while the operator runs in and out, continuing his work, making new exposures, and trying new subjects; but mottling of the plate may result if it is left in the developer without occasional agitation. Such methods are unsystematic and indefensible from a photographic point of view; but the busy microscopist may find that he can, by such unwarrantable measures, sometimes treble the number of his successes without notably lessening the value of any one of them. Thus developing, one here and there, of a series which he wishes to make, the microscopist can photograph thirty or more preparations in a single hour of good sunlight; and, as he puts away his apparatus at its close, he can count four or five finished negatives, and some two dozen exposed plates that give promise of being as good, as soon as he finds time to develop them. If this time is lacking, they may be turned over to a professional photographer, as may also the tedious process of making paper prints from the negatives.

How long to expose will always be the cardinal question, and the learner will generally be disappointed at the vague answers he receives from the expert. Hold to one brand of plate (the same emulsion, if possible) and one developer, as giving two constants in the problem, and note carefully the lens, the distance to which the object is projected, and the clearness of the atmosphere when the exposure is made, and study your results with an expert when you can. Over-exposure is most usual in working with sunlight, and the developer needs restraining. "Bromide of brains is the best restrainer." In making the exposure some opaque object may be held so as to cut off the light from the mirror while the slide is withdrawn, the exposure made by moving it aside and again interposing it, and then the plate-holder is closed once more. In the writer's work, using a one-inch Reichert lens with good sunlight and Carbutt A plates (sensitometer 10), and obtaining an amplification of twenty-five diameters, the correct exposure is about one-fourth of a second. The light is inversely as the square of the projection distance—so with similar conditions, except double length of draw and fifty diameters, the exposure should be one second. A quick hand can limit the exposure to one-fourth of a second or less—as short as has been found necessary—but a drop shutter can be improvised to give a smaller fraction as may be desired. Summer sunshine is several times as rapid as that of winter; that of noon is far faster than when the sun is low; very little haze in the atmosphere lessens greatly the actinic power. These are facts in a problem that must be left to the judgment of the operator.

The field embraced in the picture is often an important matter, requiring considerable attention, and care must be taken that the plate shall receive all the essential portion of the image visible upon the ground glass. To this end, the point corresponding to the centre of the plate when exposed should be marked upon the ground glass, and a circle drawn around this to mark the minimum dimension of each size of plate to which the camera is adapted. Since the margins of the plates as bought are frequently faulty, the circle had better be only three inches for a $3\frac{1}{4} \times 4\frac{1}{4}$ plate, &c., though the full size of the plate can often be used without unwise economy. The draw-tube of the microscope is generally furnished with a diaphragm, which is of value in giving definition and flatness of field, but reduces materially the size of the field; the entire draw tube can, therefore, be removed at times in order to bring the periphery of an object into view without any serious compromise of the sharpness.

The method of work thus laid down has one cardinal difference from every other—it is working with the parallel rays of sunlight, and the effect is practically to photograph the disc of the sun with the preparation silhouetted against it. Every opacity which intervenes between the sun and the sensitive plate will make its mark upon the negative—dust on mirror, slide, or lens, scratches on the lens front, or bubbles in the balsam between the lenses, floating motes in the air, perhaps even sun spots, will show in the result. Stringent cleanliness is therefore requisite. To outweigh these disadvantages, the penetration thus obtained in a thick preparation, by the searching character of the light, will at times far surpass the performance of the same lens with an ocular; while, on the other hand, detail that is out of focus will often be drowned out by the flood of light—just as by the Abbé condenser when used to seek stained microbes in the tissues. A thick poorly differentiated specimen may thus give a good photograph; yet well-stained, thin, and even sections are none the less preferable. Although non-actinic colours have great theoretical advantages, admirable pictures can be obtained from hæmatoxylon dreparations. Orthochromatic and other stained plates, as well as Dr. Piersol's method of actinic contrasts, may prove a great addition to our refinements; but these are points which need not concern the beginner, who will do better to concentrate his attention on the simpler methods.

If the microscopist must confine himself to night work, his task, will be more difficult. Any lamp will serve as a source of light and a little night lamp, costing twenty-five cents, has been the writer's choice. It is to be placed, with its flame turned edgewise, in the line of the micrsocope tube, and, except for very low powers, some concentration will be required. For this purpose a bull's-eye, or some form of substage condenser, or both, will be needed. One of the objectives can be adapted as a substage condenser, or the B ocular, which Dr. Piersol recommends, may be so employed, if the microscope lacks an Abbé or other regular apparatus; but with any form the problem of an evenly and strongly lighted feld will demand careful, painstaking solution. The heat rays emanating from even a tiny flame can by no means be neglected, or the operator may find his balsam melting, and a most singular streaky picture resulting from movement of the specimen while the exposure is going on. A mere piece of interposed plane glass or isinglass will cut off much of the heat, or a blue glass may be used below the stage, but at times the cell of ammonio-sulphate of copper may be needed. Rapid plates are in place for this work, since the time of exposure must always be considerable, averaging at least as many minutes as the sunlight requires seconds. A convenient dark room, however, will enable the operator to carry on several processes at once, and two dozen good negatives may often be made in an evening. With powers above 100 diameters the writer has done rather better work with lamplight than with sunlight; but this is because he has never prepared himself for high-power work. Concentration of the light is needed for such work, and can be used with safety to the objective and preparation only when the heat rays have been eliminated—a matter easier with lamplight than with sunlight.

A few words in recapitulation. By securing a camera, with a cone to connect it with his microscope, a piece of plank, a developing solution, some hyposulphite of soda, a ruby light, a few pans, and some dry plates, the microscopist has the needed outfit for beginning his photographing. The outlay will be from $20 up, but may be greatly lessened if the camera is made, borrowed, or bought second hand. Fastened to its baseboard, the camera may stand out of the way in a corner until wanted; then, in five minutes, all can be gotten into readiness for work. The apparatus is to be so placed that the sunlight falls upon the plane substage mirror (projected out of the window if necessary), and the light reflected into the instrument. The standing mirror is placed at the far end of the apparatus, so that the operator, as he stands by his microscope can see the ground

glass reflected in it; then it is easy to adjust the illumination, find and centre the field, and get an approximate focus. Accurate focussing is then done with the aid of a magnifying glass, and the plate-holder, charged with its sensitive plate, is substituted for the ground glass. An opaque object is held so as to cut off the sunlight while the slide is drawn, is removed, and replaced, so as to make the brief exposure desired, and then closing his plate-holder the operator detaches it, and seeking his dark room proceeds to develop his negative, and reloads. A miss may call for another shot—a hit will open the way to a long series of results more or less successful. Taking careful note (written as well as mental) of each exposure, the microscopist will quickly become master of one situation at least; and, while he must expect varied fortune when he changes the conditions and enters unknown territory, he will find much of it open to ready conquest, and having once entered the field he will not quickly be willing to quit it. Let him begin with sunlight and a good low-power objective, and he will quickly achieve brilliant results, which the expert can hardly excel; and even though he makes no attempt to enter other fields, he will find that he has made a most valuable addition to his powers as a microscopist.

B. Alex Randall, A.M., M.D.

American Journal of Photography.

PRACTICAL STEREOSCOPIC PHOTOGRAPHY.

[Wilson's Photographic Magazine.]

"I am tired to death. I had my hand camera with me all last summer, but think I did fairly well. I really did get a few very good negatives of the 'White City,' and feel proud of them. In the developing they gave me no trouble, came up reasonably quick, were clear, and print first-rate. My friends have been so persistent in asking for 'just a few,' that they kept me busy printing until a few weeks ago, when business required my presence in Toledo, Ohio, for a week or so. A friend had declared to me that Toledo is one of the most beautiful cities in the world, and that it was no doubt the place where Adam and Eve lived after leaving their first home. He declared that the 'fig-leaf' was a misprint, and that it was the Maumee water-lily leaf that Eve used for her aprons. Consequently it was with great expectations that I placed a new roll of films in my camera, and, if I did not find things in that city as I had been led to expect, I managed to expose the full roll during the week, and came home with the intention of confronting my friend with a set of the views, in order to convince him that his estimate of his city did not agree with what I found there. But, alas! on developing I could get nothing to suit me. The best were those exposed on the river, but they all came out awfully muddy, and the best of the balance were foggy. Some would not come up at all. Yet I treated them just as I had done those taken in Chicago."

The above is the synopsis of a story told to me by a young amateur who has come to me for advice now and again. I promised to assist him further. He certainly had had very good success with his Chicago negatives; they were taken during midsummer and under the most favourable conditions. The Toledo views, however, were made during midwinter. He at first laid all the blame upon the films not being so good as he had used before, but I had no difficulty in making him understand where the fault really was. He is an optimist, and exclaimed, "So much for experience; I shall know better next time." He thought he would get him a large outfit for the coming spring, and, as he expressed it, "I shall be more careful with a large plate, and if I only take a few during the summer, and they turn out awful nice, they will do me more credit than a host of little things." I told him that idea was all right as far as it went, but not to give up his hand camera, for one can catch so many nice little things with it that could not be had by any other means—such as pictures that had life in them, that had to be taken at once ere the opportunity was lost. "But," said I, "if you want some things that are 'newer'—that are 'new' to you, a change, as it were—why not go in for stereoscopic work?" "Do you mean," he asked, "those double photographs that require a glass to examine?" "Yes." "Why," he replied, "I would give a good deal if all the negatives that I took last summer were of that kind." And no doubt he would; there are a great many like him (and there will be many more) who would have had more pleasure had they made stereoscopic views. There are none made, photographically or in any other way, that approach Nature so closely or give the same satisfaction as one has in looking over a set of first-class stereoscopic views. The only wonder to me is that they should have fallen into comparative disuse. My young friend was much pleased with the plan if I would only help him; he was afraid, however, that his friends would have to get stereoscopes. But this is not always so; you would be astonished to find how many families there are who can find a stereoscope hidden away in the cupboard of the house or elsewhere. I know of one young man who came into my gallery about a year ago and wanted to know if I would buy of him a dozen or so of stereoscopic views. I was astonished. I had on my shelves several hundred stereoscopic negatives, and have sold but very few for a long time. I saw this same young man a few evenings ago at a church where I was giving a lantern entertainment; he was exceedingly well dressed, and, as I afterwards found out, had a Sunday-school class in that same church On inquiry I found that he was still selling stereoscopic slides from house to house and making a good living.

Who says stereoscopy is dead? I predict it will be a lively trade before long. But to return to my young friend that is to take lessons. When I first began, "in the fifties," I used a small plate with one lens on the camera. When I came to Detroit in 1860 I used 4×8 collodion dry plates. I afterwards used 5×8. I now use the 5×7 and made about one hundred and fifty negatives last summer. But if I live long enough I shall change to the old size of 6½×4¼ size. In old times you could not always work clean up to the edges, but with the excellent plates we now obtain everything is satisfactory. I need not tell the photographic world how to take stereoscopic negatives, but I will give a few ideas that I intend to impress upon the minds of my younger friends. I have had a very long experience in making stereoscopic views. I have by me a few taken in 1858, and I know a good slide when I see it. I am free to say that I have seen better slides than I have ever made, and from those who made them I would be pleased to learn, but the new beginners I am willing to help. A 4×7 mount is as large as I think ought to be used, and I like a buff colour best. For this size there is no necessity of using a larger plate than a 6½×4¼. I myself prefer to cut and transpose me negatives. It is less trouble to print them, less trouble to mount, and there is no danger of the view breaking in the middle. A 3½-inch to a 4½-inch focus lens is what I should recommend, but for pure landscape a single lens of 5½-inch focus might be used. For special work I have used to advantage a lens of 7-inch focus. For interior work it is sometimes necessary to use a very short-focus wide-angle lens. In this work, as in all other, there is an advantage in having more than one set of lenses. Orthochromatic plates will be found of great service in stereoscopic work. Above all, beware of *over-intensity*. It is the bane of a stereoscopic negative. Spend all the time needed in the selection of your view; it is of more consequence in a stereoscopic negative than in any other; and pay particular attention to the *selection and arrangement of your fore-ground*, as this is the *great secret of a successful stereoscopic view*. Metol I recommend as the developer for a stereoscopic negative. I obtain with it better detail and greater transparency in the dark places than with any other developer I have ever used, with great freedom from stain or fogging. I again say, Beware of *too much intensity*. I do not like a burnished slide. I prefer the cold roller. It is true that a highly burnished slide may, in some instances, give a little more transparency to the shadows, but the slide soon gets dirty; whereas the cold rolled one will keep clean much longer. These pictures are handled a great deal, and a burnished slide will show the handling awfully soon. I have seen slides cut 3¼ inches from centre to centre. This is altogether wrong. They should never be more than 2⅞ inches. I do not mean from outside to outside; that may be 3¼ inches if you so desire; but from some object on one side to the same object in the other half the space should not exceed 2⅞ inches. Have everything sharp, clear, and full of detail, and very little black or white in the picture. I again give the metol formula that I find works very satisfactorily:—

No. 1.

Metol	60 grains.
Sulphite of soda (dry)	180 ,,
Carbonate of potash	180 ,,
Water	8 ounces.

No. 2.

Bromide of potash	1 ounce.
Carbonate of ammonia	1 ,,
Water	20 ounces.

For use, the proper proportions of No. 1, No. 2, and water, will much depend upon the exposure and subject. For very quick exposures you might use No. 1. It will bring out very quickly all there is to be got, and in fact, if the light was very good, the image will flash out so quickly that you might suppose that all was lost. But you will find (if not over-timed) that everything possible has come up; then give it time and you will find the density gradually come up without fogging the shades. On

fixing you will be surprised to find the finest gradations of tone. With plates which have had time exposure use, say, No. 1, one ounce; No. 2, from thirty to sixty drops, and one ounce of water; and with a few trial plates vary the quantity of No. 2, and use more water. By this means you will soon understand the working of this particular developer with a certain quantity of No. 1, while by variations of exposure and with variations in the quantities of No. 2 and of water you can get any result desired, from a hard black-and-white to the softest negative required. I do not think there is any photographic work of any kind or character wherein good taste and judgment in the selection of the subject will show to better advantage than in a first-class stereoscopic negative. It should be plucky, without hardness, little black or white, and chock-full of detail.

JEX BARDWELL.

LANTERN SLIDES.

[Anthony's Photographic Bulletin.]

CONSIDERABLE has been written on this subject, says Mr. H. S. Nutt in *Anthony's Bulletin*, but from the numerous inquiries it would appear that either the articles failed to touch on some important point with sufficient clearness, or something necessary had been omitted. There is nothing difficult in the production of slides, and with a little care and use of brains very good ones should be made, with few losses. The plates on which they are made being supplied all ready for printing, either by contact or through the camera, have relieved the amateur of many of the troubles that surrounded him in the old wet-plate days, when it was a necessity to prepare the bath, developer and intensifier, and have them in perfect order. A streak, comet, or some other of the many imperfections that were constantly showing themselves, have been done away with, and in place we have a neat parcel containing twelve plates on fine thin glass, cut to proper size, ready for use, and at will. These plates, being what are termed "slow dry plates," can be handled in much stronger light than the more sensitive landscape plates; hence, in printing by contact, sufficient non-actinic light can be used to adjust the plate on the negative, so that the picture will occupy the desired position. The handiest light to use for printing I have found to be one of the patent gas jets, which is apparently extinguished when the gas is turned off, but is actually lighted in a small tube below the regular jet, and enclosed in a case surrounding the burner. On turning the tap, the small jet lights the regular burner.

The time of exposure requires practice and judgment. Holding the printing frame about fifteen inches from the burner, I give from five to ten seconds, depending upon the strength of the negative and its colour. If desired to show more on the slide than a contact print will yield, the entire negative can be printed in the same space as occupied by the opening of the mat, by copying it through the camera. As these cameras are sold and advertised by your publishers, I will not describe it here further than to say it is a double camera, one which the lens goes in the centre compartment, the negative on one end, and the lantern-slide plate on the other, the size of subject shown on the plate being determined by the position of the lens. When using 4 × 5 negatives, the 4 × 5 camera will be found more convenient, and, when once set in position, all the negatives can be copied without changing the position of lens or plate. An extra holder is advisable, for, when one picture is printed, a new negative and plate can be exposing while the previous one is developing. I use a lens with minute diaphragm that will require at least three and a half minutes' exposure. This gives me time to put the last exposure in the tray, and look at those being developed, and to remove finished ones from the hypo, &c.

The camera should be pointed at the sky without anything intervening. If this is not practical, put a clean, smooth piece of tissue paper in the window, and point the camera at it, with fully two feet space between the negative and the paper. If placed too close, there is danger of photographing the grain of the paper through the clear parts in the negative.

For developer I find that a weak one is necessary, and use the same kind as for developing the negative, adding an equal bulk of water and from one to two drops of a saturated solution of bromide of potassium. The development must be carried until the image appears much denser and stronger than wanted in the finished slide. It will thin out wonderfully in the hypo soda. This latter must be clean, and I never use an old fixing bath. I add three ounces hypo to one pint of water, and to this one ounce of acid sulphite of soda. This latter is most useful in the hypo bath for negatives.

After the slides are properly fixed, they must be thoroughly washed. I emphasise the word thoroughly, because if you value your slides and wish to keep them perfect, you must eliminate all the hypo. The acetate of lead bath, as introduced years ago by the late Mr. H. T. Anthony, is the most effectual of all. After washing in two changes of water for fifteen minutes each, place the plates in a solution of one ounce of acetate of lead, dissolved in one quart of water, allowing them to remain for ten minutes. Then remove and wash in fresh water for at least half an hour, changing the water every ten minutes, You can then rely on there being no hypo in them.

Put on a rack to drain and dry, where no dust can deposit on them. A grain of dust magnified in the lantern looks quite large, and if it should happen to lodge, where I have known them to, in the eye of a subject on the plate, it will spoil the entire effect.

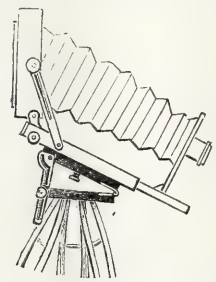
In mounting them, I take the mat, and, placing it on the picture in the exact place I wish it to occupy, hold it firmly, and moisten the slide with a wet brush under the mat close to the edge, then press the mat down until it sticks. These are then allowed to dry, when they can be piled one on the other. Clean the cover glasses, ending by polishing with chamois or wash leather. Next cut your stips of gummed paper, of which I use the manilla, called "Sheplie gum paper." The strips are cut just fifteen inches long, which allows one to go entirely around a slide and lap half an inch. These are moistened with a brush, and, although at first they are inclined to curl considerably, will soon lie perfectly flat and ready for use. I have three or four ahead of the one being used, which saves considerable time. Dust the slide carefully, then the cover glass; place them together and hold with the thumb and forefinger by the centre of each glass. Place the edge on the gummed strip about three inches from the end. Fold this end up against the edge, turn in the corners, then wheel the slide along, repeating until it is finished.

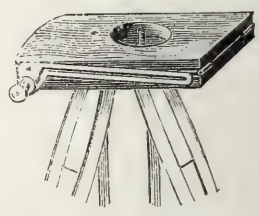
There is no more beautiful way of keeping a record of pleasure jaunts than by making a series of slides from the negatives and showing them to your friends. Paper photographs seem insignificant before them, and I have many negatives that have been used only for slides. The work of making the slides is nothing compared to the recompense in exhibiting them. A very handy parlour screen is easily made by taking five feet of white roll paper same as used by artists, fifty-four inches wide, and gumming each end to two plain curtain rolls. This can be suspended in the room almost anywhere, and its clean, white surface shows off the slide to perfection. I prefer the picture shown not over above size in a private house, and the result is better than where larger screens are used, unless a light much stronger than oil gives is used.

THE "Y Z" PORTABLE TILTING HEAD OR TABLE FOR CAMERA STANDS.

Sharp and Hitchmough, Dale-street, Liverpool.

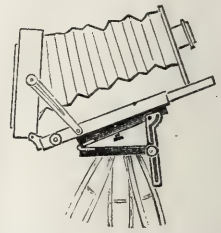
BY means of this head the camera can be tilted or directed as required without disturbing the legs of the tripod. It adds to the steadiness and





safety of the camera when set up, and is immediately fixed between the baseboard of the camera and the tripod top by means of a binding screw.





It folds into a space four by five inches. It is also useful for copying or indoor work, and may be used for taking views overhead or flat on the ground. From the illustrations here given, its simplicity and uses can at once be seen, the variety of inclination that it affords making it an extremely convenient adjunct in camera work.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [July 6, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

Considerably over fifty pages of Mr. Fallowfield's new Annual are devoted to the lantern and its accessories.

* * * * *

Mr. C. S. Baynton, of Exchange Buildings, New-street, Birmingham, is introducing special coloured binding strips for lantern slides. They are made in a variety of colours, are accurately cut with perfectly straight edges, of uniform width, and adhere perfectly to the glass.

* * * * *

By the way, Mr. Baynton, who succeeds to the business formerly conducted by Mr. Samuel Hulme at the above address, is a practical photographer of great skill—a quality which should, and doubtless will, stand him in good stead in his enterprise.

* * * * *

Mr. C. T. Milligan, of 728, Chestnut-street, Philadelphia, has sent us his catalogue of magic-lantern apparatus, &c. This is in two parts. The first deals with descriptions and prices of a varied stock of lanterns and accessories interspersed throughout the catalogue being some really useful practical hints on the management of different forms of light, how to use the apparatus, and other information likely to assist the users of optical lanterns. Mr. Milligan is himself an experienced lanternist, and the advice he here gives has therefore a double value.

* * * * *

The second portion of Mr. Milligan's catalogue is devoted to a list of slides, both large and diversified. Brother Milligan's catalogue shows that his lantern establishment holds a deservedly popular place in the esteem of American lanternists.

* * * * *

The portable lantern which Mr. Sharp, of Messrs. Sharp & Hitchmough, showed before the Photographic Club and the London and Provincial a fortnight ago was much admired for its neatness and practicability. We hear that there is a probability of its being adopted for use by the London School Board.

* * * * *

Commander Gladstone writes: "As I expect to leave England before long, I have resigned the position of Hon. Secretary to the Lantern Society. Mr. W. Bashall, 21, Holland Villas-road, W., has succeeded me, and all communications should in future be addressed to him."

* * * * *

A gas-propelled tramcar has been tried at Croydon. The charging station is at the depot of the Croydon and Thornton Heath Tramways Company at Thornton Heath, where an eight-horse gas engine drives a compresser. By this latter the gas, which is taken from the gas company's mains, is pumped into a steel cylindrical receiver 25 ft. long and 4 ft. diameter, at a final pressure of ten atmospheres as a maximum, or 150 lb. pressure per square inch. From the receiver a pipe is laid down to the tramcar charging point, the cylinders of the car being charged in the same way as those of railway carriages are charged with gas for lighting purposes. The pressure in the tramcar cylinders is about eight atmospheres, or 120 lb. per square inch, at starting, and the cost of the gas used is stated to be 1*d.* per mile with a fully loaded car.

* * * * *

The latest method of so illuminating theatres as to distribute the light uniformly is that devised by Mr. Krabaski. He employs a conical reflector, painted white inside; round the arc is a prismatic glass ring, and under the arc an opalised diaphragm. It is claimed that the rays of light are variously collected and refracted by this system so as to produce a very uniform light with a very small loss (ten per cent).

A SIMPLE PHOTO-MICROGRAPHIC ATTACHMENT TO AN ORDINARY CAMERA.

Before the Société Francaise recently, M. Londe described a photo-micrographic system by M. Lemardeley for attachment to an ordinary camera which, on account of its simplicity and relative cheapness, should be welcomed by many who are desirous of taking up this branch of photography, but are deterred by considerations of expense. The apparatus is represented in fig. 1. It consists of a piece, P,

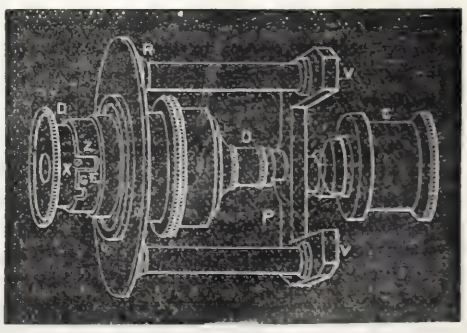


Fig. 1.

mounted upon pillars and provided with two clips, V V. At O is the objective, with a micrometer movement, M. C is a condenser. At D is the diaphragm designed to limit the field of the image. The

whole is fixed to a disc, R, which is mounted upon the camera (fig. 2). The pillar piece, P, is arranged in a peculiar way. It is

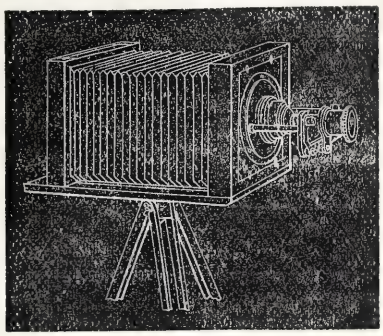


Fig. 2.

hollowed out, and the clips designed to hold the preparation are below instead of being above, as in all microscopes.

The following is the system of mounting the objective:—The tube of the objective-holder, X, slides in a tube, Z, actuated by the micrometer screw. This tube is provided with two indents, E E', of different depths. Upon placing the pin, G, of the objective-holder tube in one or other of these indents, or in contact with the edge of the tube, Z, the objective is placed automatically at such a distance that the image shall be distinct upon the plate with every magnification. By this arrangement, feeling one's way is avoided, and the micrometer screw will be employed only for finishing the focussing, if that be necessary—a manœuvre that will be useless if the apparatus is well regulated, and for the same extension of the camera, of course. If a short focus be employed, the pin must be put into the deeper notch, in order to approach the front side of the preparation. In cases where the other combinations of longer foci are employed, the pin must be put into the indent of less depth, and, finally, against the tube, Z, for feebler magnifications.

GAS CYLINDERS.

Your contributor, Mr. James Lewis, takes a refreshing view of the cylinder question, and I would commend his article on cylinders in your last Lantern Record to Mr. Chadwick, an occasional correspondent of yours on the same subject. I think, if the views held by these two gentlemen could be blended, the result would be a fairly accurate judgment of the case.

Mr. Lewis is probably correct in his statement that too much has been said about the Bradford accident; but he is unfair in imputing to the gas-compression companies any desire to make trade capital out of the event. On behalf of the Brin Companies I have stated on more than one occasion our reasons and authority for refusing to fill certain cylinders, and for the adoption of additional safeguards. If Mr. Lewis is not aware of these facts, he has no right to publicly criticise our action; if, on the other hand, he writes with a full knowledge of what has taken place, your readers will, doubtless, have been struck with the peculiar logic of his arguments in favour of a *status quo* with regard to cylinders.

With my own knowledge of these facts, I would summarise Mr. Lewis's letter very much as follows:—

"It is admitted on all hands that the Bradford cylinder was unfit for use, and the investigations which followed the accident showed that, by adopting certain simple and inexpensive additional precautions in the treatment of cylinders, similar accidents could be avoided. This Bradford explosion is, however, the only one of its kind that has ever occurred. Let us therefore ignore it and the lessons it has taught. After all, the boy was more to blame than the cylinder, and, if we must do something on the strength of this experience, let us avoid giving cylinders to careless boys."

I have no wish to treat Mr. Lewis's letter with disrespect, but I think, if this optimistic theory were universally practised, it would not be conducive to the interests of public safety.

With regard, however, to compressed gases. As it is difficult to distinguish between careless and careful boys, and as even men are liable to drop cylinders and knock them about, Mr. Lewis will surely admit that it is better to take steps to ensure cylinders being safe, under all contingencies of transit, than to attempt to educate railway porters and errand boys to handle them with care.

It is exactly with this object in view that the Brin Companies have adopted their new regulations. These are not the outcome of any senseless scare resulting from the Bradford accident. They were arrived at after long and careful investigation on our part, and are endorsed by the opinions of Professor Unwin (the highest authority in the kingdom on such a subject) and other well-known impartial experts, whom we consulted before finally deciding on our course of action. The question was essentially one for experts to decide, and we do not ask cylinder-users to blindly accept any dictum of our own in the matter. We are merely carrying out what all impartial authorities are agreed upon. If we had maintained the passive attitude advocated by Mr. Lewis, cylinder-users would, at the present time, be exposed to far more hampering restrictions on the part of the railway companies than those which they experienced at our hands, which latter cause only a temporary inconvenience, whilst they tend to the ultimate safety and development of the business. What Mr. Lewis describes as the Bradford scare has, in my opinion, been prolonged mainly because of the hostility shown by one or two newspaper correspondents to the action taken by the Brin Companies in refusing to fill certain cylinders. It is ridiculous to hint that we have done this to derive some pecuniary benefit, for we have had to condemn, under our new regulations, more of our own early type of cylinders than all those of our customers put together. Would rational business people do this, and hamper their trade with such regulations, unless very strong grounds existed for so doing?

When all is said and done, not ten per cent. of the cylinders in the compressed-gas trade failed under these new rules; and, by replacing the majority of these, we have been able, so far as our own business is concerned, to establish that uniformity which is the secret of the safety of the trade.

What is an infinitesimal risk to the consumer is a serious risk to the compresser. Mr. Lewis appears to think that the reverse is the case; but, if he will remember that, where the consumer handles one or two cylinders the compresser has to handle many thousands, that the maximum pressure of a cylinder must of necessity be when it is filled at the compressing pump, and that all the attendant risks of shocks, oil, and mixed gases, have to be first encountered there, he will probably admit that compressers are justified in hedging round their business with any safeguards they think it desirable to employ.

It is more foolish to underrate a risk than it is to exaggerate it. If we had ignored the simple lesson which the Bradford accident taught us, Mr. Lewis might have been satisfied, but the liability to similar accidents would not have been lessened. I believe nearly all gas-users approve of our action in the matter. We have incurred expense which we never hope to recoup in the manner which Mr. Lewis suggests. We trust rather to developing our business by proving to the public that we are ready to put the safety of the trade beyond all other considerations.

Kenneth S. Murray.

THE SEARCH LIGHT.

I hear that Mr. W. I. Chadwick has been unwell, but, I am pleased to say, is now better. Mr. Chadwick's indisposition may account for the fact, which I have noticed, that the advertisement pages have recently been without the solitary gleam of humour they occasionally contain, and for which we are indebted to him.

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After a year's work as Secretary of the London and Provincial Photographic Association, Mr. T. E. Freshwater "stands down." He has well earned the thanks that have been tendered to him, for ever since last October his position, on account of the constant occurrence of scenes which would do credit to the House of Commons in its most obstructive mood, has been one of much difficulty and delicacy.

I HOPE that, now Mr. Freshwater occupies a position of greater freedom and less responsibility at the London and Provincial, he will find time during the coming winter to give one or two demonstrations of the lantern microscope and its wonderfully fascinating revelations. I have had the pleasure of "sitting under" Mr. Freshwater when he has been showing microscopic objects on the screen, and can vouch for the fact, that even to non-microscopists his examples of this branch of the art of projection are as instructive as they are interesting.

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I HOPE, too, that Mr. R. P. Drage, who so lately returned from a long tour in the East with a large number of exposures, will not forget his old love, the London and Provincial, but will book a date for a lantern lecture, illustrative of his travels and adventures. Mr. Drage tells me that he took films with him, and has had the unpleasant but inexplicable experience of many of the impressions on the sensitive layer fading into what I may term "undevelopable nothingness." This phenomenon of the fugitiveness of the latent image on sensitive celluloid appears to be traceable to varying thermometrical conditions, and suggests a fine field of experimental work for the, alas! diminishing band of investigators in mitigating or obviating it.

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MR. P. EVERITT, as the successor of Mr. Freshwater as Secretary of the London and Provincial, is emphatically the right man in the right place at this juncture. His technical, personal, and administrative powers are of a high order, and he may be assured of the loyal and hearty support of his Committee and the general body of members. I do not doubt that, under his guidance, the Association will swiftly prosper and improve, and that the haggling and quibbling, of which it has recently been made the centre by one or two seekers after the notoriety of sham martyrdom, will be effectively checked and repressed. For his programme during the coming year Mr. Everitt has received promises of papers, &c., from such men as Haddon, Teape, Traill Taylor, Child Bayley, Welford, Oakden, Freshwater, Atkins, and others.

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THE scare caused by the explosion of a cylinder at Bradford last winter was a costly one to the gas-compressers and the lantern dealers. One Company was 500*l.* out of pocket by it, and the losses among the trade were considerable.

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EARLY in the approaching autumn, Dr. Lansdell, the celebrated traveller, is to give a lantern lecture, illustrative and descriptive of some of his distant journeyings in strange lands, at the Central Photographic Club.

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WITH the year's Convention to be held in Dublin and photographers from the principal parts of England attending it, we may, I suppose, count upon a good crop of Irish lantern slides for exhibition next winter. Get as much of the scenery as possible on your plates gentlemen, but—leave the "brogue" alone, please. RADIANT.

AMATEUR ENLARGING ARRANGEMENTS.

MANY amateurs are deterred from doing their own enlargements by the idea that it is a troublesome process, necessitating the setting apart of a special room for the purpose, besides a costly outfit, optical and otherwise, but I shall endeavour to show that such is far from being the case. It is quite true that, where much work is done in a variety of sizes, a well-equipped enlarging room, or at least a properly constructed enlarging camera for out-door use, will very much simplify matters, and make things run more smoothly, but for the ordinary requirements of the average amateur, who is content to confine himself to sizes not larger than 15 × 12, appliances of the most primitive character, supplementing the apparatus he already uses for the production of the negative, will answer perfectly.

Then, the possessor of an ordinary quarter-plate camera and lens may, out of such rough material as an empty packing-case and a few pieces of card or mill-board, construct an enlarging apparatus that will enable him to convert his quarter-plates into 15 × 12 or 16 × 13 pictures, and produce results that could not be surpassed by the most elaborate and complete outfit. If I may describe such an arrangement that I knocked together in a few hours some years ago as a makeshift, it will perhaps afford a useful hint or two to some of the mechanically inclined amongst the readers of the RECORD.

In my own case I was relieved of the trouble of constructing a dark slide, as I had one which suited the purpose, and this portion of the apparatus will probably prove the most formidable item. It need not, however, cause any alarm, as it may be of the roughest construction, either in wood or millboard, or a combination of the two; and, as it is only required to carry paper and not glass, and to be used at home, it needs neither great strength nor elaborate finish. For simplicity of form and construction, nothing could excel a slide of this description I saw in use by a friend some time ago. It consisted of a cheap drawing-board properly tongued and grooved costing something like eighteenpence, round the edges of which were glued strips of millboard an inch wide and a quarter of an inch thick to form a sort of shallow tray. On the top of these were glued two more strips of the same material, the middle one being a quarter of an inch narrower than the rest, so as to form a grooved moulding like an ordinary dark slide, the shutter consisting of a sheet of the same millboard. Some little care is desirable in cutting the millboard in order to get clean edges, and it will be better to get this done by a bookbinder in a proper cutting press. If, however, this is not convenient, the edges may be smoothed with fine glass paper, and afterwards varnished with shellac varnish, or, perhaps, better still, rubbed with paraffin wax, which can be worked into the millboard with a hot iron. The shutter may be hinged by glueing a strip of calico along the joint. The paper is inserted in the slide from the front, and affixed to the drawing-board back by means of drawing pins.

The slide having been constructed, a box or packing-case is selected of suitable dimensions, and here I may say that nothing answers better for 15×12 than a Tate's "Cube sugar" box. Supposing a six inch focus lens be used, it will enable a quarter-plate to be enlarged to from three to four diameters if a little play be allowed at the lens end of the arrangement as I shall describe. The whole of the box, inside and out, should be pasted over with brown paper, or, at any rate, the joins between the sections of the wood; and the lid in the same manner. The latter should then be cut across its shortest width about one-third from the end, and shortened about an inch, and the two portions hinged together by means of a strip of cloth or leather glued on, the larger portion being nailed on to the body of the case, leaving the other piece to lift up in order to give access to the interior, and leaving, when closed, a slit wide enough for the dark slide to enter.

The slide will just fill one end of the case, and two fillets of wood should be nailed down the sides to form a groove in which it will slide. In the centre of the opposite end an aperture is cut about six inches square, and outside, and below this, a little shelf or bracket is fixed on which the quarter-plate camera will stand with the lens just level with the absolute centre. If the shelf be made about ten inches or a foot long, it will allow sufficient margin for adjustment and variation of the size of image from three to four diameters with a six-inch lens, and from four to five diameters with a four-and-a-half-inch. A short sleeve of velvet or black twill should then be nailed round the aperture, and made to slip on to the lens of the, small camera with an elastic band, in order to exclude all light. The apparatus is then complete with the exception of adjusting to focus.

If the amateur is satisfied to work always to one size or degree of enlargement, a single adjustment will answer for all time; but it will be more satisfactory to have the power of varying the degree of amplification to some extent. But three or four separate adjustments may be made, and the exact positions of the lens and front of the focussing screen can be permanently marked, so as to avoid the necessity for constant focussing for each enlargement, leaving only

the work of centering the picture. To make the adjustment, I have found the following a convenient plan:—Insert in the dark slide some printed matter in the exact position occupied by the sensitive paper, and across it draw a bold, sharp line, or band, say six or eight inches long. Place the slide in the enlarging camera, draw the shutter, and, opening the half-lid, let a strong light fall upon the printed matter; then focus sharply upon the ground glass of the smaller camera, adjusting the latter at such a distance that the measured line is represented, say, exactly one-third the original length. Then mark carefully, first the position of the front of the camera upon the shelf or bracket, and also that of the camera back upon the base board. The same operation is repeated, if necessary, at different distances, until the reduced image is one-fourth of the original. By the law of conjugate foci, a negative placed in the frame of the focussing screen when in these ascertained positions, will have its enlarged image thrown in the sharpest possible focus upon the plane of the dark slide, and, while greater accuracy of focus is attainable than by the examination of the enlarged image, the operation is performed once for all. Of course, if preferred, the focussing can be done in the ordinary way by examining the larger image through the open top (or side, whichever may be the more convenient position for the opening) of the camera. The adjustment of the image, as regards centrality, will, of course, be effected in this manner the rising, or sliding front of the small camera here proving useful.

The only detail that remains to be explained is the method of lighting the negative, but fortunately this is extremely easy. The whole arrangement may be fixed upon a sloping board, so as to point to a clear north sky, though this is not always an easy task for various reasons, it being far more convenient to keep the camera in a horizontal position. At one time, some years ago, circumstances so favoured me that I was able for the best part of the working day to point the camera directly at a whitewashed wall facing almost due south, and always presenting a fine surface of even illumination, whether in sunshine or diffused light. In full sunshine I think this proved the best light I ever used.

The most convenient plan for general purposes, however, will no doubt be to use the light reflected from the sky, the camera being placed in a horizontal position on a table in a doorway, and an ordinary swing toilet glass placed in front of the negative, and fixed at an angle of 45°, the end of the table projecting sufficiently into the open to secure a clear view of the sky. Some operators use paper or opal reflectors, but the mirror is undoubtedly the best and quickest, the latter being a point of some importance when, as under the circumstances will very frequently be the case, the lens employed is a slow landscape one.

The method of using this apparatus requires very little further explanation. The negative is placed in the position of the ground glass of the small camera, which must be removed for the occasion, and the position of the image adjusted by means of the sliding front, the focussing having been already done as described. Then the dark slide with the sheet of sensitive paper having been placed in position, and the whole covered with a focussing cloth—negative as well—the shutter is withdrawn, and the exposure made by uncovering the negative for the requisite time. W. B. Bolton.

LANTERN MEMS.

With a brilliant sunshine and summer temperature, so high that it borders on the tropical, it requires a good deal of resolution to sit down to write the "mems" for this month's Lantern Record, for the tendency is to seek the shelter of friendly shade, whether it be in beautiful lanes, charming parks, or silent dells, rather than make the effort necessary for writing. In fact, it is a time more for dreaming and play than action and work. This being so, I do not think I can do better than conjure up a reverie of the past lantern season, and, with the perfume of all the lovely flowers now in full blossom and the hum of the bee for music, try to hark me back to the days of winter or semi-darkness, when the optical lantern was such an aid to entertainment and instruction.

That the optical lantern has increased in popularity no one who is behind the scenes will fail to admit, for not only are more manufactured, but year by year there are more distributors, while users are found at nearly all scientific institutions and various kinds of missions and societies, and among the clergy, politicians, &c., besides being largely depended on for illustrations in variety entertainments. I suppose the law of supply and demand regulates optical lanterns the same as other commodities, but I sometimes think there are far too many dealers in apparatus. However, as long as the competition only produces improved instruments and advanced methods of use, no one will find fault, for the choice is all the greater for purchasers.

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Even this variety and large supply is to a busy man not always a blessing, for knowing what to choose and where to purchase is often nearly as difficult a problem as what to give for a present. As a rule, one's own judgment is not relied on unless some past experience has shown the weak and strong points of the earlier apparatus, and, if what is wanted cannot be found in a stock apparatus, the order has to be placed for one to specification.

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Should one of the numerous patterns advertised and stocked by opticians be selected on the recommendation of an expert or lanternist friend, it in all probability serves as a stopgap until the right lantern is found, something like purchasers of bicycles and tricycles, who have had, first, large wheel ordinary, then safety, next cushion tyred,and afterwards pneumatic,until the next development is reached, a lanternist is, in like manner, kept interested in the changes taking place in the design of the optical lantern and by the acquisition of new apparatus.

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For anything to be popular at the present day, it must be fashionable or of absorbing interest, and bring either monetary advantage in its train. To an amateur lanternist there is before him the opportunity of rendering practical assistance to charities, besides giving excellent entertainment to friends at the very time of the year when intelligent recreation is so much needed in the country and suburbs of large towns; and for the professional if he will but do the thing in first-rate style, using only a good apparatus and having first-class slides, a good reputation will soon be obtained that will bring the right patronage to secure success.

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That fashion plays some part I am convinced from personal observations and knowledge, and can safely say in the scientific world that the fashionable and popular pastimes are now photography, astronomy, and the optical lantern. The popular side of microscopy has followed the stereoscope into limbo, for the microscope is only consistently used by a comparatively few enthusiasts, and the recruits to this branch of study are few and far between, except that body who are obliged to use it professionally, viz., medical men.

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The form of optical lantern keeps on varying, and, where only one or two patterns were in existence twenty years ago, now hardly a month elapses without three or four new designs are noticed, while for the future I hear of new portable lanterns being constructed, and various patterns of biunial and triple lanterns, suitable for using with the electric light, will be shortly on the market.

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Hand-fed electric lamps are now acknowledged to be all that is necessary for lanternists' use in ordinary projection lanterns, and their steady working and brilliant light has been demonstrated during the past season. That the electric light is the light of the future for the optical lantern goes without saying, and it is only a matter of time and expense making the distribution of electricity quite general and so available for all projection work.

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Photo-micrography and the projection microscope will receive a fillip from the introduction of the simple and economical electric

lamps, and enlarging and photographic printing is always possible at any studio where the electric current is available. This means of illumination must come more into use in photographic printing, where economy and expedition are studied, for at certain seasons of the year (as every photographer knows) the daylight is so ineffective for printing that very little can be done.

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ETHER-saturators have retained their popularity; and with old or new forms, if certain precautions are taken, and plenty of ether used to ensure complete saturation, and no falling off in supply towards the end of the entertainment, a satisfactory light resulted. Common or indifferently made saturators must be avoided, and not be used under any circumstances in the future, if the operator realises his responsibilities and desires to avoid alarm. G. R. BAKER.

STEREOSCOPIC NOTES.

[Abstract of paper read before the South London Photographic Society.]

OPTICAL DEFECTS IN STEREOGRAPHS.

ANY departure from the few rules for making stereographs, which I have already given you, mars the effect of the picture in some way or another, even if it does not entirely destroy its adaptability for binocular examination. The sources of failure do not end here, however, and I propose now to allude to some not uncommon defects caused by the employment of the lenses under improper conditions. The nature of those defects will at once reveal the means for preventing them.

If the lenses are not vertically centered—that is to say, if one is placed higher on the camera front than the other, then, in the resulting stereograph, a portion of the view in one of the prints will be higher than the corresponding point in the other, the consequence being that, seen in the stereoscope, the two prints will not superpose or coalesce. Similarly, if the objectives are not horizontally centered—that is, mounted so that each transmits its image approximately centered to the centre of the plate, then it will be found that dissimilar views as regards included subject will result, and, again, binocular effect will not be secured. These two points are worth bearing in mind in stereoscopic transparency-making in the camera, where the imperfect centering of the lenses in copying the negatives will lead to unsatisfactory results in the transparencies.

An appreciable difference in the foci of the two lenses has a double disadvantage—the two images are of unequal size, and one is not so well defined as the other. Although not entirely fatal to a passable kind of stereoscopic effect, such pictures are only a compromise between success and failure, and should be guarded against in the manner apparent. By separating the lenses at too great a distance, especially for near objects, too much dissimilarity in the respective views of the one subject is obtained, the consequence being an exaggeration of relief. Seen stereoscopically, the example I show you does not, perhaps, exhibit the effect of the error very well, but you will note that the figure appears to have been photographed from points of view widely separated, as one can see, as it were, right round the face in both cases.

Generally speaking, any defect which appears in the one half of a stereoscopic picture is manifested in the coalesced image obtained in the stereoscope, hence irregular markings of all kinds are to be dreaded. An exception to this rule is found in the case where two halves of the negative are not of equal density. The prints from these will be of unequal depth; but, notwithstanding this, perfect superposition and coalescence is got in the stereoscope. This phenomenon of varying density of the two halves is very puzzling. It is one that most stereoscopic workers meet with; but, so far, no explanation of it has been forthcoming. In my case, it appears at rare intervals and is well marked in development. I need hardly say that I can guarantee the identity of foci and lens' apertures of the objectives with which I work, and this makes the phenomenon all the more difficult to understand. Fortunately, as I have said, it has no practical drawback.

STEREOSCOPIC PORTRAITURE—A HINT TO THE PROFESSION.

I frequently hear professional photographers complain of the lack of novelties with which to attract the patronage of the public. "New styles of portraits" are often asked for by many who, I fear, have not exhausted either the artistic or the profitable qualities of the old. In suggesting that professional photographers should take up stereoscopic portraiture, I do not claim novelty, either for my suggestion or the idea, for, as you will see by the examples of stereoscopic portraits by the Daguerreotype process that I now show you, professional photographers were alive to the advantages of this style of portraiture many years ago. The march of improvement in photographic processes has made stereographic portraiture much simpler, cheaper, and more practicable than it was at the date at which these pictures were produced, and I quite believe that, by exploiting binocular portraits among their clients, the most agreeable financial results would follow to professional photographers. It is needless for me to dilate upon the realistic charm which stereoscopic portraits possess; let it suffice to say, that what a binocular view is to a single view in solidity, depth, and verisimilitude, so is a binocular portrait to a single portrait. It may be well to touch on certain practical aspects of the matter, regard for which is necessary if success is expected. In the first place, exaggeration of relief and what practically amounts to distortion of the face and figure, is to be avoided by paying attention to the proper separation of the lenses, if a twin-lens camera be employed. As studio portraiture necessitates that the sitters should, as a rule, be very near the camera, it will be found that the distance between the lenses has to be proportionately reduced. Possibly a mean separation of two and a half inches would be found suitable as a working guide. Large heads and figures would obviously be out of the question, and possibly the most successful effects would be produced by showing as much of the figure—say, three-quarters or full length—in the picture as possible. The stereoscopic effect would be considerably heightened by the judicious placing of suitable accessories in planes both to the front and the rear of the sitter; and this in turn suggests that "at-home" portrait stereographs, showing the sitters amid domestic surroundings, might be popular. Such photographs could be produced at no higher cost than that for cabinet prints, inasmuch as the two exposures would be made on one plate, and the two prints in the one frame. The extra trouble of trimming and transposing the prints would be inconsiderable. Within the limits of this short paper the whole subject of stereoscopic portraiture is perhaps too large to treat in detail, although its main principles differ in no essential degree from the other branches of stereoscopic work, and I only now touch upon it for the purpose of bringing it under the notice of our professional friends as a possible help to business. I may add, that scientifically effective stereoscopes, far superior in construction to the cheapest forms with which you are all familiar, can be made and sold for a moderate sum—indeed, there is no real reason why such should cost more than half-a-crown at the outside. I strongly recommend each professional photographer to place on view, in a prominent part of his reception room, a magazine or revolving stereoscope containing a carefully made selection of portrait stereographs for the inspection of his callers and sitters, and I am confident he would find the bait a sure and lucrative one. It is useful to note that stereoscopic portraiture lends itself admirably to the use of one lens, instead of two, the necessary dissimilarity being obtained by the old plan of the side movement, and that the practicability of the plan is favoured by the rapidity with which portrait lenses work.

ARCHITECTURAL STEREOGRAPHY.

You will notice that many of the slides I have shown you are of architectural subjects, both interior and exterior, and are taken stereoscopically, a branch of the art in which photographers of a past generation undoubtedly excelled. I know that I am addressing a Society whose reputation for architectural photography is collectively a great one, and that it includes individual members, notably your President and Secretary, who are masters of this kind of work, and I am equally certain that it is needless for me, even were I competent, to teach you anything in connexion with it. Possibly some of you may already take pictures of architectural subjects stereoscopically, but, for the general benefit, it may be well if we speak of one or two conditions to be observed if failure is to be avoided. Non-distorting lenses are obviously advisable, although it should be borne in mind that, if single objectives are employed, the margins of the pictures need not be utilised for binocular examination, so that it is not only possible, but practicable, to use them when objects approach very near to the camera. The avoidance of such defects as hardness and halation in the prints will be obvious to you, while the methods of preventing them will be equally plain. The general rules I have already given fully apply, but a special word may be desirable in reference to selection of subject. Bare interiors, an example of which I show you, are unsatisfactory in stereoscopic treatment; objects should appear in the foreground, middle distance, and extreme distance, if the best effect is to be obtained. It is a maxim in this kind of work that the success of the result entirely depends on the presence and disposition of foreground objects, and interior architecture is no exception to the rule. I show you another example, and one which I consider a successful one.

You will observe that it is a church interior; in the immediate foreground are pews, the eye then wanders to a marble tomb, beyond which are the pulpit and pillars; in the distance are arches, hanging lamps, and the organ. As an example of interior stereography, it is, I consider, perfection.

What I have said of interiors holds good with regard to exteriors. Plain monotonous foregrounds are to be avoided, but, if it is impossible to get suitable foreground objects when taking comparatively distant views of buildings, &c., relief may be imparted to the latter by separating the lenses an extra inch or inch and a half.

Stereoscopic Hand Cameras.

Stereoscopic hand cameras are in growing use, and in my opinion are likely to increase in popularity. I have before now pointed out their value for securing binocular records of animated scenes, such as street views in large towns, where the daily, hourly changes of life and movement are of a kaleidoscopic nature, for animal portraiture, marine or river life, life on the racecourse, in the market-place, in the fields, in the parks—in short, for all the thousand-and-one opportunities for depicting what we may term the living world at home and abroad which at present are seized by the monocular hand camera. You will so easily understand how largely hand-camera work would gain by binocular treatment, that I need not further enlarge upon this part of my theme.

I have found more than one competent photographer deprecate the use of stereoscopic hand cameras on the ground of there being a difficulty in keeping the base line of the plate, or, what comes to the same thing, the camera, level enough to allow of the perfect superposition of the two resulting prints. Remembering that a stereoscopic hand camera need not be more than two inches wider than a quarter-plate hand camera, it is a little hard at first sight to understand where the increased difficulty of maintaining a perfectly horizontal base line comes in. Looked at closer, however, we can see that the objection has great force, for, inasmuch as many users of ordinary hand cameras do not make a point of holding them absolutely level, the declination, although most likely inappreciable in a single print, would assuredly manifest itself in two binocular views seen stereoscopically. The pictures, in short, would not coalesce. So far as I can see, this is the only real obstacle to success in stereoscopic hand-camera work; but it is not so formidable that it cannot be surmounted with a judicious mixture of care and practice.

Thomas Bedding.

THE ELECTRIC LIGHT IN THE LANTERN.

The following interesting discussion on this subject took place at a recent meeting of the Photographic Society of Philadelphia.

In consequence of the unexpected absence of Mr. S. Ashton Hand, who read the paper at the last stated meeting in reference to Hot Pressed Steel Cylinders for Holding Gases, the discussion announced for this meeting was postponed.

Mr. George Vaux, jun., asked if there was not some lamp that could be used on the low-pressure electric current, served by the local electric light companies, for use in a projecting lantern.

Mr. Jennings stated that on a visit to Messrs. Colt & Co., in New York, they showed him a lamp for use with the incandescent system, which would burn three hours at a cost of ten cents, giving about 2000 candle. It could be used with an alternating current by the use of a transformer, but it gave out a disagreeable noise.

Mr. Redfield asked if the use of the electric light did not give cold tones to the slides.

Mr. Jennings replied that he thought this could be overcome by the use of a yellow glass or some other coloured substance.

Mr. Stirling asked if there was not some resistance inserted in the circuit while using this lamp. Mr. Jennings replied that there was not, neither was there any flicker, and the light was therefore suitable for enlarging.

Mr. Stirling stated that the carbons in this lamp were inclined and permitted of closer regulation, which prevented the arc from playing around the points of the carbons, as it would do if placed directly in line; consequently the light was steady.

Mr. Milligan stated the trouble with the use of electric lamps was that they could not be used on all currents.

Mr. Ives stated that there had been introduced in London, recently, the Davenport lamp, which could be used on all circuits. The carbons are regulated by hand instead of by magnets, and usually there was some resistance inserted to ensure steadiness, although the light was very steady without it.

Mr. Vaux asked if the regulation of the carbons by hand did not interfere with the steadiness of the light. Mr. Ives replied that of course in the hands of a careless operator it would, but that he had seen it used repeatedly at the Camera Club, and the carbons were turned about once every two minutes, with very good results.

Mr. Jennings stated that Colt & Co., of New York, had a lamp regulated by hand instead of magnets, which was much cheaper than the one regulated by magnets.

Mr. Milligan asked if one carbon did not burn faster than the other. Mr. Jennings thought it did. Mr. Milligan then stated that one lamp, made in Philadelphia, was of that kind; one carbon burned out very rapidly. Mr. Stirling also spoke of a lamp made in Philadelphia that had the same fault, the lower carbon being hardly long enough to outlast a lecture.

Mr. Milligan stated that an objection to the use of the electric light was that it greatly weakened the colour in coloured slides, particularly blue.

THE ENRICHMENT OF COAL GAS.

The light from coal gas is employed by so many photographers in contact printing, &c., that the following remarks which Professor Vivian B. Lewes contributes to *Nature* on the subject of its enrichment may be of interest:—

The illumination which can be obtained by the consumption of coal gas is entirely dependent upon the method by which the gas is burned. From a so-called 16-candle coal gas the consumer rarely obtains a value of more than 12 candles per 5 cubic feet of gas consumed, whilst, by using burners of rational construction, upwards of 40-candle illuminating power could be obtained for the same consumption of gas.

The light emitted by a coal-gas flame is dependent upon its temperature, and flat-flame burners, exposing a thin sheet of flame to the cooling action of the air, give the worst results. Argand burners are better, as the cooling is not so great, whilst the regenerative burners lately introduced, by utilising the heat of the products of combustion for raising the temperature of the gas and air supplied to the flame, give an enormous increase in the light emitted.

If the gas companies could only get an Act passed authorising the use of the regenerative burner as the standard, there is no reason why they should not call the gas at present supplied 40-candle gas; the consumer, however, using the flat-flame burner would still be only obtaining the same light as at present. Incandescent mantle burners, which act on a totally different principle, also yield a high illuminating value.

On carefully testing the burners in ordinary use, we find that for an equal consumption of gas the results at once show the enormous advantage to be obtained by regeneration, and also how serious is the loss which attends the employment of ordinary burners.

Light obtained per Cubic Foot of 16-candle Gas Consumed.

Burner.	Candle units.
Regenerative and incandescent	7 to 10·00
Standard argand	3·20
Ordinary „	2·90
Flat-flame No 7	2·44
„ „ 6	2·15
„ „ 5	1·87
„ „ 4	1·74
„ „ 3	1·63
„ „ 2	1·22
„ „ 1	0·85
„ „ 0	0·59

These burners were by well-known makers; but there are plenty of cheap German nipples in the market which will give even worse results. In the above table No. 7 is the largest flat-flame burner given, as any larger size would never be used for indoor illumination; but, with some of the big flat-flame burners employed for outdoor work, as much as three candle power per cubic foot of gas is developed by the best make, while it is also quite possible to find cheap imitations of them, which can scarcely be distinguished by their appearance, only developing a little more than one candle per cubic foot. It seems probable that 10-candle units represent the maximum light to be obtained in practice per cubic foot from the so-called 16-candle coal gas, as, although greater regeneration will increase it as high as sixteen units, the heat is so intense that the burner is quickly destroyed. Taking 10-candle units as being the maximum amount of light for a consumption of one cubic foot of gas per hour, an approximate idea of the waste of illumination which attends the ordinary methods of burning the gas can be formed.

If the burners most commonly in use in houses be examined, they will be found to consist chiefly of No. 4 and No. 5 flat-flame nipples, and it would not be over-estimating the number in use to put them at eighty-five per cent. of the total. The remaining fifteen per cent.

is made up of larger flat-flame burners, argands, and regenerative lamps, which give a higher service; but it will be found that the total value obtained will not exceed 2·5 candles per cubic foot. This means that seventy-five per cent. of the total value obtainable from the gas is wasted, and that for our present expenditure in coal gas we could obtain four times as much light.

Mr. George Livesey some time ago proposed that unenriched coal gas should be supplied to the consumer at a lower rate than is at present charged for the enriched 16-candle gas, and this question is of such interest and importance to both consumer and gas company that it deserves the gravest consideration.

In large towns like London, where the gas companies have to supply a gas of specific illuminating power, and where the gas is continually subjected to photometric tests at stations spread over the whole area supplied (any deficiency in the lighting value of the gas being visited with rigorously enforced penalties), enrichment in some form or other becomes a practical necessity. In London the gas has to have an illuminating power of sixteen candles; and in order to ensure this over so enormous an area, the gas must be sent from the works testing up to from 16·5 to 17 candles. With seaborne Durham coals of the character most largely used in the metropolis for gas-making, the illuminating value of the gas will be about fifteen candles, and the gas manager has to enrich the gas by from 1½ to 2 candles before he can with safety send it out for distribution. This enrichment is done in several ways: (*a*) by the admixture of a certain percentage of cannel coal with the original gas coal; (*b*) by carburetting the coal gas with the vapours of volatile hydrocarbons; (*c*) by mixing the gas with carburetted water gas; (*d*) by admixture with rich oil gas.

Up to four years ago the admixture of a certain percentage of cannel coal with the Durham coal was the only method of enrichment employed by the metropolitan companies, and was perfectly satisfactory, as, the coal being mixed, the gases came off together under the same conditions in the retorts, and a uniform gas was the result. During the past few years, however, the increase in price of cannel has forced the gas companies to find some other process which shall take its place, and the Gas Light and Coke Company tried experiments which led to their largely adopting carburetted water gas for this purpose.

When steam acts upon carbon at a high temperature, the resulting action may be looked upon as giving a mixture of equal volumes of hydrogen and carbon monoxide, both of which are inflammable but non-luminous gases. The water gas is then carburetted, *i.e.*, rendered luminous by passing it through chambers in which oils are decomposed by heat, and the mixture of oil gas diluted with water gas is made of such "richness" as to give an illuminating value of twenty-four or twenty-five candles, and this, mixed with the poor coal gas, brings up its illuminating value to the required limit. During the winter months the gas supplied by the Gas Light and Coke Company has mostly contained about ten per cent. of the carburetted water gas.

This form of enrichment has several serious drawbacks: it increases the percentage of the highly poisonous carbon monoxide in the gas, and so makes leakage more dangerous, whilst carburetted water gas burns with a short but very brilliant flame, far shorter than coal gas, a 22-candle water-gas flame burning from a London argand at the rate of five cubic feet an hour, with a flame only two and a half inches in height; whilst a 16-candle flame of the gas supplied up to three years ago gave a flame three inches in height; and the gas now supplied and enriched with the carburetted water gas only gives a flame 2·6 inches in height, in order to emit a light of sixteen candles.

When a householder lights his gas burners, he invariably turns on the gas until he gets the largest possible flame without roaring or smoking, and, from the alteration in the composition of the gas which has taken place, this means using far larger quantities of gas than heretofore, so that, although an increase in illuminating power is obtained, a substantial increase in the quarter's gas bill is also found.

Another objection to this form of enrichment applies even still more to the admixture of rich oil gas with the poor coal gas, and is that, although gases of different gravities mix perfectly well in small vessels, yet, when you come to deal with the huge gas-holders used in the modern gas works, stratification of the gas takes place, and even if the enriching gas be mixed with the ordinary gas in the foul mains, so that they may pass through the scrubbers and purifiers together, uniformity in illuminating power is never obtained, and with the London coal gas variations of from sixteen to eighteen candles in value are found at the testing stations.

A burner which is giving its best duty with a 16-candle gas, will be very apt to smoke when burning a gas of higher quality, and under these conditions the products of combustion become more injurious to health from the presence in them of a larger proportion of the products evolved during incomplete combustion.

Enriching gas by the vapours of volatile hydrocarbons enables the manager to bring his gas up to the legal requirements as regards the illuminating value at the testing stations, which are mostly fixed where the great trunk mains deliver the gas to the districts to be supplied, and it is only under exceptional circumstances that the illuminating value of the gas is ever found to be below the required limit at these points. The consumers, however, reap but little benefit from it, as the loss of illuminating value during distribution is very great where this method of enrichment is employed.

No matter how enriched, change of temperature and other troubles incidental to distribution generally reduce the illuminating power of the gas to a considerable extent before it reaches the consumers' burners, so that its actual value is far more often fifteen candles, although it may have been tested over sixteen at the station.

In the big mains the gas is continually flowing at a fairly steady rate, and is neither exposed to any great alteration in temperature, nor, from the size of the mains, to any very great amount of "skin friction," *i.e.*, rubbing of the gases against the sides of the pipes; but, as soon as distribution commences, both these factors come into play, and, as some of the chief illuminants of the gas are vapours and not permanent gases, lowering of temperature causes condensation of some of them, whilst the power which friction against the sides of the main service pipes, coated with deposited hydrocarbons, has of withdrawing the illuminants from the gas, still further decreases its light-giving value, and, anywhere near the dead end of a service, stagnation of the gas during a large portion of the twenty-four hours when gas is not being consumed adds still further to the trouble, so that, even at the testing stations, the influence of the small consumption of gas on Sundays, the consequent stoppage in the manufacture on that day, can be traced in the illuminating value found on Monday morning.

Coal gas, as made from Durham coal at the temperature employed in the Metropolitan Gas Works, has an illuminating value of about fifteen candles, and the enrichment of this gas up to the required value costs far more *pro rata* than the amount of light obtained from the unenriched gas.

This cost has entirely to be borne by the consumers, and the whole practical question to be decided resolves itself into—'Is the game worth the extra candle and a half?'

If coal gas were used for illuminating purposes only, the consumer would be a considerable gainer by having the unenriched gas supplied at a lower price; and, when we consider the amount of gas used as a fuel, and that the quantity so employed is daily increasing, the cost of the enriched gas becomes of the greatest importance.

The value of one candle in illuminating power in the gas supplied in London at 1½*d.* per candle is 180,000*l.*, and, if this calculation be correct, consumers in the metropolis would be saved about 270,000*l.* a year by using unenriched coal gas, and probably not one of them would notice the slightest difference in the light emitted by the gas in the burners ordinarily in use.

In the regenerative burner the increase in illuminating value is almost entirely due to the rise in temperature causing methane, which forms about 34 per cent. of the coal gas by volume to become a very valuable illuminant, and, as there is just as much or more methane in the unenriched gas, it is manifest that this increase will still be found.

In the incandescent burner the coal gas is burnt in an atmospheric burner, and the non-luminous flame is made to heat a mantle of refractory material up to incandescence, and for this purpose the 15-candle gas will do as well as the 16.

One argument which has been raised against the lowering of the standard is that, if a 16-candle gas is reduced to 15 candles during distribution, a 15-candle gas will be lowered to 14. This, I think, is a mistake. An enriched gas is lowered in illuminating value because certain vapours are condensed from it; but it will be found that with an unenriched gas, made at a high temperature, this action is decreased to a minimum, on account of the small proportion of vapours present.

MR. F. E. IVES ON "PHOTOGRAPHY IN NATURAL COLOURS."

At the meeting of the Photographic Society of Philadelphia, on May 9 last, Mr. Frederic E. Ives exhibited by means of the electric lantern the three-colour pigment prints shown on April 25, and gave a brief *résumé* of the process by which the negatives were made and the printing colours selected.

The President asked Mr. Ives the difference between his system and that claimed to have been invented by Vogel, of Berlin.

Mr. Ives: I do not know that Dr. Vogel has ever published a definite process of composite heliochromy with three negatives and three printings, although he has used such a process since reports of the sucess of my method were published. His alleged publication of a new principle in 1885 distinctly discredits the idea that three negatives and prints are sufficient, as any one can see by turning to his communication to the *Philadelphia Photographer*, September, 1885, page 303. There are three spectrum colours, and only three, which can be mixed to reproduce all other colours, and three dye or transparent pigment colours, and only three, that can be made to produce the same result by absorption; and the mixture of these colours must be regulated, in the negative-making process, by the action of mixtures of spectrum rays in certain definite proportions, which yield negatives of the spectrum showing density curves like the curves in Maxwell's diagram of the colour sensations as modified by Abney. The facts of colour science are not of my discovery, but their direct and definite application to the solution of this problem may be said to have amounted to the introduction of a new working principle, which had not been discovered by others so far as I know. Dr. Vogel certainly never stated such a working principle, nor specified such sets of colours or negatives; what he did do was to discredit the possibility of getting the results with three negatives and printings, and to state a proposition which I cannot reconcile with the recognised facts of colour science.

Mr. Stirling said there was undoubtedly a strong desire on the part of the general public for "a photograph in natural colours," in the form of a print on paper which could be viewed by ordinary reflected ght. He asked Mr. Ives to state the difficulties in the way, assuming that the negative-making part of the process was done in accordance with the correct principle as laid down in Mr. Ives's system and the correct printing colours employed.

Mr. Ives replied that the difficulty was solely mechanical. To reproduce the colours correctly, the balance of the printing colours has to be very perfectly maintained. Two or three per cent. of variation in the printi. g of a single one of the blocks would be sufficient to spoil the result with some subjects. It was also very difficult in making the process blocks with single lines to reproduce the exact modulations of light and shade in the negative.

Mr. Stirling: In making the blocks for this three-colour printing, is it necessary to make a print from the negative and then copy that again?

Mr. Ives: There are a great many ways of making process blocks. Some make them direct from the original negative, others make a print and copy from that, and others make a print on glass and copy from that. The method I prefer is to make a transparency and work from that, because we can get the modulation better in a glass positive than we can on paper in a silver print.

Mr. Julius F. Sachse said that he had seen specimens of the Vogel experiments in colour printing, both with gelatine and process blocks, and that he had never seen one in which the three impressions were perfectly registered.

Mr. Ives: I made prints by machine printing by process blocks, crossing the lines substantially as Kurtz and Vogel do, in 1881, at least ten years before any one else in the world tried to it, but I did not attempt to make any commercial use of the system, because, being a practical printer, I knew that the trouble that would be experienced with inks and pressmen would prohibit the making of these prints sufficiently perfect to realise a commercial success at that time. The variation in the inking, the changes in temperature and moisture during the course of the day would change the proportion of the three inks and make the prints unlike each other. We would have had this three-colour printing far more perfect than it is to-day at least six or eight years ago, if it had not been for this difficulty, which will undoubtedly be overcome in the course of time. The distribution of ink will be improved and there will also be an improvement in the inks and in the printers. When I commenced making process blocks I was able to turn out plates as delicate as any made to-day, but the printers said they were of no use; but since then there have been new papers made, and improvements in inks, and such blocks as the printers at first rejected they now print from every day. It is the same with colour printing; the printer is not ready for it, and it may take as long to realise the conditions of colour printing as it did to realise the conditions of half-tone blocks.

Mr. Sachse asked if good results might not be expected from the collotype process.

Mr. Ives: The collotype process is utterly unsuitable for the purpose. The inking, if done by hand, will not make two prints alike in the course of an hour. One print will be a little deeper, another a little flatter, and in the end the print will be too red, or too yellow, or too green, or too blue, or too purple. The amount of ink depends upon the handling of the ink roller, and no printer is expert enough to do uniform work, although some very pretty results have been obtained. I know from the testimony of collotype printers, who have done beautiful work in three printings, that they never showed more than one print out of twenty pulled. Selected specimens have been shown to people to show "how easy it is done," in order to get them to place money in the process.

After some further discussion relative to theories of colour vision, &c., Mr. Lewis asked if the cause of not getting good colour prints was not caused by colour blindness on the part of the printers.

Mr. Ives: I believe at least nine out of ten people have perfectly normal colour vision, but a man may have normal colour vision and yet pay so little attention to colours that he is unable to distinguish the various shades. You must study colour and be interested in the study to develop fine colour perception.

LIMELIGHT JETS.

In The British Journal of Photography, of April 6, 1894, is a very interesting article on the limelight jets (says the *Exhibitor*), wherein the correspondent gives a description of a trial between jets of different forms, the principal object in view being the settlement of the disputed question as to which form, the mixed jet or the unmixed jet, gave the best light.

The first trial was between two jets, one without a mixing chamber and the other with a medium-size mixing chamber. The jets were placed in lanterns having similar optical systems, and after a thorough and impartial test, during which the nipples were interchanged, it was clearly evident that the jet having the mixing chamber gave the best light.

Then followed a test between the better one of those two jets and another jet, which had a larger mixing chamber, and in which were placed diaphragms which thoroughly mixed the gases. It was then found that the last jet, the one in which the gases were thoroughly mixed, the one in which the large mixing chamber was placed, gave a still better light, and it was also noticed that the greatest advantage obtainable by this jet, was that the control of the light, or, as we think it can be better expressed, the control over the gases, was far easier than with either of the two forms of jets.

The writer does not, we think, point out wherein this better control is obtained. We have had considerable experience in that direction, and would call the attention of any of our readers who may be interested in the subject, so much so as to hunt up the article, to the positions of the diaphragms in regard to the jet. Our readers will notice that the diaphragms and gauzes are close up against the jet proper, being placed at the top of the mixing chamber as well as toward the bottom.

We have experimented in the same direction, and have found that the best forms of jets have the gauze placed immediately below the jet proper. By this arrangement the gases are thoroughly mixed before they issue and the counter currents are all destroyed. The writer also calls attention to the fact that the better jet was the most quiet.

There is one portion of the article that we do not think Americans will agree to. In speaking about the old theatre limelight jets it is intimated that they were poor and that they were noisy, and that a noisy jet was not considered so much of a drawback. Our experience in that direction is just the contrary. Noisy jets were not allowed on the stage in this country as far as we know, in many scenes they would not be permitted, as quietness was an essential, and the limelight jets that we have had in use for theatre work for about twenty-five years were perfectly quiet, giving a better light than any jet that we know of, and we have always ascribed the reason for it to the fact that the mixing chamber is six inches long and three-eighths of an inch bore; and from this it will be seen that our friends across the water are to-day just finding out what we knew well twenty-five years ago.

We were not surprised to know, from a gentleman who has just returned from England, that the English lantern folks are way behind us in reference to the jet business, and that blow-through jets, as they are styled there, are in almost universal use. We may say that here they are almost unknown, especially so to those who are recently in the business.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*August* 3, 1894

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

A very interesting paper by Mr. J. W. Gifford on an inexpensive screen for monochromatic light in connexion with photo-microscopical work, appears in a recent number of the *Journal* of the Royal Microscopical Society. While at work on the various aniline dyes in connexion with their photographic effect on the salts of silver where they are exposed to the light of the solar spectrum, it came to Mr. Gifford's notice that the absorption spectrum of benz-aldehyde green, commonly known as malachite green, was a very remarkable one. A series of experiments was then made from which Mr. Gifford deduced the following claims: 1. It gives a field of view uniformly monochromatic. 2. There is more light than with chrome copper solutions. 3. It need not be used in solution. 4. No bathing of plates in erythrosine or cyanine is necessary, an ordinary rapid plate being sufficiently sensitive. Mr. Gifford concludes his paper with the suggestion that the application of malachite green might also be useful for reproducing objects in their natural colours by the Lippmann method, but as yet he has made no experiments in this direction.

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The statement is made that the Midland Railway Company have found electricity too costly, and that they are going to make oil gas from shale. This gas is said to be compressible, so that a large quantity can be stored. An oil-gas factory has been started at Derby, and others are to be erected at Sheffield, Nottingham, &c.

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An exhibition of a new incandescent light, the property of a Company in the City, was recently given. It is claimed that Mr. Chandor, the inventor, has found novel means of illuminating by incandescence. The substance employed is made out of a composition consisting of certain ingredients which, when mixed together and passed through a process of heat, become hard and solid, and can be shaped into different forms, according to its adaptability either to gas or oil lamps. Reports say the incandescer, applied to a paraffin lamp, increases the illuminating power forty per cent., and decreases the consumption of oil thirty-three per cent. Another advantage to be derived from the use of the incandescer is said to be the doing away with the unconsumed carbon.

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At the Technical Meeting of the Photographic Society of Great Britain on Tuesday, August 28, the subject for discussion will be Limelight Apparatus, to be introduced by Mr. R. R. Beard.

Mr. Walter Tyler, of Waterloo-road, entertained his staff and a number of friends to a whole-day river trip and dinner in the neighbourhood of Staines and Windsor, on Monday, July 22. Our invitation card was unfortunately lost in the post, so that we were unable to be present; but we hear that a very enjoyable time was passed by all concerned.

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"There is just now proceeding, at the Victorian Club, Sackville-street," says "First Fiddle," of the *Stage*, "a remarkable series of lectures by Miss E. S. Atkins. The lady lecturer has dived into Genesis, and has now reached the comparatively modern period of B.C. 666. What the lectures refer to I do not rightly know, but they must be remarkable, for Miss Atkins is dealing with *Divine Motherhood and Music*, and is 'giving the real meaning of the Bible, and showing the true position of women *by means of the scale of A minor*.' There are coloured limelight illustrations, and vocal and instrumental music. All this can be had for a shilling a time. 'Tis a mad world, my masters!"

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The Scotch and Irish Oxygen Company and Mr. Brier, of Glasgow, have patented an improved system of testing gas cylinders, an illustrated description of which will be given in our next.

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Mr. H. G. Wells, in the last number of *Nature*, has a somewhat caustic article on *Popularising Science*, from which we make the following extracts:—"In this matter of writing or lecturing 'down,' one may even go so far as to object altogether to the facetious adornment of popular scientific statements. Writing as one of the reading public, I may testify that, to the common man who opens a book or attends a lecture, this clowning is either very irritating or very depressing. We respect science and scientific men hugely, and we had far rather they took themselves seriously. The taste for formal jesting is sufficiently provided for in periodicals of a special class. Yet on three occasions recently very considerable distress has been occasioned the writer by such mistaken efforts after puerility of style. One was in a popular work on geology, where the beautiful problems of the past of our island and the evolution of life were defaced by the disorderly offspring of a quite megatherial wit—if one may coin such an antithesis to 'ethereal.' One jest I am afraid I shall never forget. It was a Laocoon struggle with the thought that the huge subsidiary brains in the lumbar region of *Stagosaurus* suggested the animation of Dr. Busby's arm by the suspicion of a similarly situated brain in the common boy."

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"The second disappointment was a popular lecture professing to deal with the Lick Observatory, and I was naturally anxious to learn a little of the unique appliances and special discoveries of this place. But we scarcely got to the Observatory at all. We were shown—I presume as being more adapted to our intelligence—numerous lantern slides of the road to the Lick Observatory, most of them with the 'great white dome' in the distance, other views (for comparison

probably) with the 'great white dome' hidden, portraits of the 'gentlemen of the party on horseback,' walks round the Observatory, the head of an interesting old man who lived in a cottage near, the dome by moonlight, the dome in winter, and at last the telescope was 'too technical' for explanation, and we were told in a superior tone of foolish things our fellow common people had said about it. For my own part, I really saw nothing very foolish in a lady expecting to see houses on the moon."

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"My third experience was ostensibly a lecture on astronomy, but it was really an entertainment—and a very fair one—after the lines of Mr. Grossmith's. 'Corney Grain in Infinite Space' might have served as a title. It was very amusing, it was full of humour; but, as for science, the facts were mere magazine *clichés* that we have grown sick of long ago. And as a pretty example of its scientific value I find a newspaper reporter, whose account is chiefly '(laughter)' with jokes in between, carried away the impression that Herschel discovered Saturn in the reign of George the Third."

LANTERN SLIDES BY THE CARBON PROCESS.

Amongst the many different processes available for the production of lantern slides there is one that may be said to be almost entirely neglected by amateurs, to whom it offers very many advantages. I allude to the carbon process. The reason is probably to be found in the fact that to the majority of amateurs the process is entirely unknown, or, if known in theory, it is supposed to present insurmountable difficulties, which render it suitable only for professional use. So far from this being the case, for the special purpose to which I allude, it is one of the very easiest processes to work when the routine is learnt, and such facilities now exist for obtaining the tissue in the smallest quantities, ready for immediate use, that I wonder it is not more generally employed.

A packet of sensitised tissue, a bottle of transfer collodion (though this is not absolutely necessary), and a squeegee, if such do not already form part of the outfit, are all that are required to try the process, which offers the advantage of giving absolutely permanent pictures of unapproachable tone and clearness and without the necessity for the extremely careful manipulations that accompany the production of transparencies upon collodion or gelatine plates. At the present time of the year, when the evenings are too short and the dark room too stuffy to encourage much transparency work upon dry plates, the carbon process is particularly convenient, and may be worked at any spare moment, morning or evening, that the amateur may have at his disposal.

Of course it will be fully understood that this method is only available for contact printing, the tissue not being sensitive enough for use in the camera; but this is perhaps not a serious drawback when we consider how large a proportion of the cameras in use are of quarter-plate size, and how many negatives are specially taken for direct lantern-slide printing. But, even when a larger size of negative is habitually worked, it is surprising how many lend themselves to the production of slides by contact, "bits" being selected from the larger picture, which in themselves form perfect or, at least, pleasing compositions. I myself for years worked no smaller size than $7\frac{1}{2} \times 5$, but was in the habit of making many lantern slides from those negatives by contact printing, both on dry plates and carbon tissue, and the latter were certainly not the most difficult to produce. If a lantern mask be passed over the surface of a landscape negative of the size I have mentioned, or a half-plate, in a very large number of cases minor compositions may be found in the larger picture which do not strike the eye without such assistance, and it is for such subjects as these, no less than for those specially taken, that direct-printing methods are useful.

An objection has been urged by some against the use of carbon for lantern slides that the relief of the image interferes with the definition on the screen, but that this is a fallacy is proved by the excellence of quality of slides produced by the Woodburytype process, in which the image is of a precisely similar character, namely, a cast in relief in coloured gelatine. That slides may be produced by either of these processes in which the relief proves objectionable is no doubt, perfectly true, but this is rather the fault of the operator than of the process. The object should, of course, be to produce an image possessing as little relief as possible, while yet presenting the gradation necessary for a satisfactory picture.

This brings me to the question of tissue. As is well known to those who are at all acquainted with the process, a special tissue is made on purpose for transparencies, in which a large proportion of colouring matter is combined with a minimum of gelatine, so as to render a sufficiently vigorous image without too great a thickness of gelatine, and a consequent excessive relief. For positives on paper, on the contrary, a more translucent tissue is desirable, and this is best arrived at by a thicker coating, containing less colouring. The transparency tissue referred to, however, is chiefly intended for the production of transparencies either for decorative purposes or for use in methods of reproduction where an intermediate positive is necessary from which to work. It may, no doubt, be used for lantern slides, but I have myself obtained the best results with the ordinary tissue worked in a special way, and this presents the additional advantage of offering a greater choice of colours.

The beginner in carbon printing will perhaps do well to procure his tissue in the sensitive state, as success greatly depends upon the proper drying after sensitising; but, when he has mastered the details of the process, he will find it a decided advantage to do the sensitising himself. The character of the image required in a lantern slide is more brilliant or vigorous than that of a paper print, or rather, without being too dense in the shadows, it must possess a full range of gradation up to clear glass in the lights. Such a result, especially from thin delicate negatives, is best produced by sensitising the tissue on a weaker bath than is usually employed for average work, and therefore the amateur who sensitises his own tissue will be in a better position to suit his tissue to the character of the negatives than he who procures it ready-sensitised for ordinary purposes.

Of the different coloured tissues procurable, the best for lantern slides I have found to be "portrait brown" and "special purple," though perhaps this is greatly a matter of taste. These two, however, I fancy, give a finer image than most of the others, although, if the method of intensification I shall describe be adopted, this does not matter very much.

To sensitise the tissue, it is immersed bodily in a dish containing a one and a quarter per cent. solution of bichromate of potash, that is to say, a quarter of an ounce dissolved in a pint of water. For the ordinary run of modern negatives this will prove quite strong enough, but, if they are of more than ordinary density, the strength may be increased proportionately up to five per cent., or one ounce to the pint. The addition of ammonia to the sensitising bath is sometimes recommended, but the advantage is not very conspicuous. In cool weather the tissue should be allowed to remain in the bath until it becomes quite limp, which will probably take two or three minutes; but in hot weather the immersion can scarcely be too short, provided both surfaces are brought into perfect contact with the liquid. The tissue is then removed from the solution, and hung up for a minute or two before proceeding to the next operation.

This consists in squeegeeing the tissue into contact with a sheet of glass previously polished with powdered French chalk, or with a thin solution of wax in ether or benzole. This is desirable, as it gives the tissue a smoother surface and ensures closer contact with the negative in printing, so necessary in order to secure perfect sharpness, but at the same time it prolongs the period occupied in drying. If, however, the plate carrying the tissue be placed in a good draught, of course well protected from light, the drying will not occupy much longer than when both sides are freely exposed. Here, no doubt, the new daylight tissue will prove useful. When thoroughly dry, the tissue will strip easily from the glass, and should be at once cut up into suitable sizes and preserved under pressure.

Where rapidity of drying is an essential point, or rather when the means of drying are not of the best—for it is always desirable to dry as quickly as possible—the tissue upon removal from the sensitising solution may be laid face downwards on a sheet of glass as before, and squeegeed in order to remove as much as possible of the

solution; it is then peeled off and hung up to dry, with both sides exposed to the atmosphere. The former plan, however, is preferable, as, in addition to giving the finished tissue a more even surface, it protects it from dust as well as from any noxious fumes in the atmosphere, which are highly deleterious.

Although in the wet state the tissue is said to be practically insensitive, it is not well to trust implicitly to this, for the slightest veil produced by the action of light or by noxious emanations will utterly ruin the brilliancy of the transparency. It is well, therefore, to exercise the greatest possible care, and to treat it as highly sensitive at every stage. It will be, in fact, much more sensitive to feeble light than albumenised paper, even when the weak bath recommended is used, and the sensitiveness will increase in proportion to the strength of the bath.

Space will not permit me in this number to complete the account of the manipulations, but next month I hope to deal with the exposure and development of the slides. W. B. Bolton.

THE SEARCH-LIGHT.

The Dublin Convention is pronounced by those who attended it to have been a great success, especially in a social sense. I was not present myself, but, from all I hear, the most remarkable, and certainly the most amusing, incidents of the week have not found their way into any of the printed reports. Of photographic "results" I have seen a few with some pretensions to pictorial excellence, as well as a great many hand-camera shots which are painfully poor, both as pictures and as photographs, and which, if typical of the kind of work indulged in during Convention week, would tend to show that many of the members could find nothing better to do than photograph each other. This kind of thing has been carried to great lengths at the last three Conventions by some of the hand-camera brigade, and strikes me as being intensely childish.

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Few of my readers are aware of the contemporaneous existence of more than one Convention. *The* Convention, as it is called in contradistinction to the Photographic Convention of the United Kingdom, is now in its third year. It has a perpetual President and a perpetual Secretary. Annual meetings are held at picturesque spots, and an agenda of a formal and photographic nature, including a business meeting and a dinner, are gone through. There is no subscription, but this by no means implies that membership of *The* Convention is easily obtained. On the contrary, it prides itself on its exclusiveness, although possibly the best thing to be said in its favour is that *there is no group!* *The* Convention will hold its next annual meeting on the second Thursday of July, 1895. The membership is limited, and there are no vacancies.

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Does a man with a handle to his name consider himself at liberty to talk utter nonsense in public with less fear of criticism or rebuke than an untitled commoner would have? It is only upon some such theory as that which I have here implied that I can account for some extraordinary remarks about hand cameras attributed, in the last number of the Journal, to Sir Benjamin Stone. This gentleman, who is said to be President of the Birmingham Photographic Society, has apparently been travelling at the Cape, and at the June meeting of the Capetown Photographic Club he gave an address on photography, which in the main is amusing and pleasant reading. Sir Benjamin, however, started in a less promising fashion than he finished. He is reported to have said that "he had always endeavoured to encourage what he might term the useful side of photography, and he objected most strongly to the hand camera, as he thought it was detrimental to photography, and it was vulgar and inartistic. One had no right to take one's friends at a disadvantage; the results obtained, in his opinion, were never satisfactory. The hand camera took away all pleasure, and nothing was gained by its use but the loss of confidence of friends who were willing to sit."

I do not often use a hand camera myself, but I suppose I have seen as many hand-camera pictures as any one, and I do not hesitate to say that Sir Benjamin Stone, the President of the Birmingham Photographic Society, when he speaks of the hand camera being "detrimental to photography," "vulgar and inartistic," and "the results . . . . never satisfactory," betrays not only a sublime ignorance of the commendably large number of delightfully artistic *pictures* now produced by its aid, but is unaware of the circumstances that the Society over which he presides has several hand-camera users who, to my personal knowledge, can do hand-camera work of which any man might be proud. I hope Sir Benjamin has been misreported; certainly his remarks as they stand are a combination of foolishness and ignorance which could not possibly proceed from any one who was acquainted in the least degree with present-day photography. That many—probably most—hand-camera photographs are technical and artistic failures, and that the hand camera is often turned into a kind of mechanical Paul Pry, are facts that were deplored long before Sir Benjamin Stone bewailed them to our Capetown friends, and, even if his observations were original, they would not constitute grounds for the absurd condemnation of the hand camera of which he appears to have been guilty. When Sir Benjamin returns to England, it would be a charity on the part of some member of the Birmingham Society to post him up in the capabilities of the hand camera, and what can and has been done with it.

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A writer, who evidently knows nothing about it, ridicules the idea that much is being done in stereoscopic work by amateurs. I suppose, however, that there are more stereoscopic workers now than ever there were. A friend of mine, who since last autumn has read papers on the subject before eight photographic societies, tells me that he was surprised not only at the degree of interest manifested in binocular work, but also at the number of those who go in for it. There are also, I fancy, more stereoscopes sold now than at any time during the last thirty years, although they are of the cheapest American type. Messrs. Underwood & Underwood, the American stereoscopic publishers, could astonish us if they gave us the number of stereoscopic slides and stereoscopes they have sold in this country during the last year or two. Both numbers would, no doubt, run into hundreds of thousands.

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I have lately noticed, in both English and foreign photographic magazines, half-tone reproductions of stereoscopic pictures. We are suffering from an epidemic of over-illustration just now, and a regrettable feature of the outbreak is the frequency with which the process is unsuited to the subject. In the case of these half-tone stereographs, is is obvious that the editors of the publications in which they appeared knew little of the requirements of a process for stereographic reproduction, otherwise they would not have selected one which is dependent upon a mechanical grain for the formation of the half-tones. When seen stereoscopically, these pictures are quite spoilt by the prominence of this grain. Collotype is the only suitable photo-mechanical process for the purpose of multiplying stereoscopic pictures.

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As hinted at in a previous paragraph, stereoscopes and stereographs are being energetically "pushed" among the general public. You see them in the windows of toy and stationers' shops nearly everywhere. Our American friends, who, I believe, are doing the trade, have evidently laid themselves out to gratify all tastes, as not only are cheap stereoscopes prominent objects at certain establishments in Central London, where photographs of actresses dispute with other articles the honour of supplying the staple stock in trade, but badly trimmed and mounted stereographs of decidedly *risqué* subjects—*i.e.*, females of opulent charms, &c.—are beginning to find their way into the windows. If not in themselves distinctly offensive, these things are, nevertheless, scarcely suited for the home circle, and I sincerely hope they are not symptomatic of worse being behind. What I mean by "worse" every man of the world knows, of course. It would be a calamity if, now that stereoscopic photography is daily increasing in

popularity with photographers and the public, the breath of an evil reputation should blight its growth and development.

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So far as London is concerned just now, a large number of photographers seem to be holiday-making, and the Societies' Meetings are dismally attended. Not the smallest interest appears to be evinced in the subjects set down for discussion. The other night, at the Photographic Society of Great Britain Technical Meeting the proceedings were of such a lugubrious character that somebody passed a note up to the Chairman asking if it was "the Annual Funeral of the Society." The same absence of interest is always observable at the meetings of other societies during July and August, in which months the meetings might well be suspended. Take away the officials and those bound to attend, and very often a microscope would not reveal the presence of anybody else. RADIANT.

ON THE DETERMINATION OF THE FOCI OF MICROSCOPE OBJECTIVES, LANTERN AND CAMERA LENSES, AND OF THE SCREEN DISTANCES OF LANTERNS BY SIMPLE ARITHMETIC. (THE BRITISH JOURNAL OF PHOTOGRAPHY, *March* 30, 1894.)

OWING to prolonged absence from home, I have only just seen Mr. G. R. Baker's note in your issue of April 6 (THE LANTERN RECORD, page 27) on my article.

In reply, let me state that my table of distances between the lantern and screen is calculated for the distance between the projection lens and the screen, and not, as Mr. Baker supposes, between the slide and the screen.

The accuracy of my table may be easily verified by a simple experiment, thus: stick a piece of postage-stamp edging on the globe of a lamp, and then, with a spectacle lens, whose focus, f, is precisely known, arrange the distances so that the image of the postage-stamp edging exactly covers a similar-sized piece of edging stuck on the screen. If, under these circumstances, the distance, d, between the spectacle lens and the screen is measured, it will be found to be equal to twice the focus of the lens, or $2f$.

In this case the size of the disc is equal to the size of the slide, m; the magnifying power therefore = 1.

Then, by my formula v, page 198,

$$d = f\,m + f = f + f = 2f.$$

This agrees with the measured distance. But, by Mr. Baker's formula (the "pinhole"), on page 27 in your Supplement for April 6, it is

$$\frac{\text{disc}}{\text{slide}} \times f = 1 \times f = f,$$

which is half the amount measured in the experiment, and therefore incorrect. A similar example was given in my paper on page 197; further repetition is unnecessary.

I feel convinced that those who will take the trouble to examine this subject will never again make use of the erroneous "pinhole" method. EDWARD M. NELSON.

LANTERN MEMS.

IN a month's time from now lanternists will be actively preparing for the autumn and winter lantern exhibitions, and arranging slides of tours undertaken during the summer holidays. Those who are not away in August, and contemplate having new apparatus for the coming season, will do well to place their orders now, so as to ensure getting the same in good time, for I understand many new and improved lanterns are now being constructed. All who can avail themselves of electric current for lighting purposes should, before coming to a decision, see the results obtainable by simple arc lamps, and the facilities of manipulation and perfect kind of light obtainable with minimum of trouble and expense by means of the modern inventions and modifications in electric-light regulators.

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NEARLY all large cities and towns are now electrically lighted, and many of them by the municipal authorities; but, while large halls in London, the suburbs, and the provinces are well provided with general illumination, very few are arranged so that connexions can be readily made for projection purposes. This is a matter of great general interest to lanternists, and I suggest, as a useful work for the Lantern Sections of Photographic Societies, that each should take a certain district, ascertain what halls, schools, or public institutions (where lantern exhibitions and demonstrations can be held) are provided with electric light, and endeavour to get the proprietors or management to put a suitable lead from the main cable or branch, that will be safely available for use at a minute's notice.

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A REASONABLE charge for use of electricity might be made on each occasion to cover the cost of the initial expense and for an average consumption of electricity for, say, two hours. In this way the electrical supply companies would be benefited by increased use of current, greater safety ensured to the audience at entertainments, and improved lighting and effective results obtained by the operator; hence an all-round advancement.

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THERE must be thousands of lanternists in the country who would gladly avail themselves of the electric light, and only too delighted to be relieved of some of the *impedimenta* of the present lantern outfit inseparable from limelight apparatus, if a certainty could be made of the use of electricity the same as at the present time gas can be in most towns.

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A CIRCULAR letter might be addressed to each hall and suitable lecture or assembly-room, pointing out the advantages of the arrangement, and asking for reply, giving particulars of illumination, kind of current, and if agreeable to provide suitable connexions for projection work. The result of this might be published in our ALMANACS, or in a special pamphlet, on the same plan as dark rooms available for amateurs and others can be at once found under the head of each name or city.

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AS a subsidiary matter, the advantage of a permanent or roll-up screen fixed in the hall might be pointed out, and this might be available for a small charge or included in the fee for hire. With these two necessaries provided for the lanternist, his work would be reduced to the most pleasurable kind, for the labour and cost of transport would be almost *nil*.

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THERE are many times at miscellaneous entertainments where lantern exhibition is one of the items, that very little time is arranged for between each turn, and, if a large screen has to be erected, it is trying to the audience and often a matter of annoyance to the lecturer. I recently saw an example of this where a lantern show was announced in a large tent at a certain hour, and a military band monopolised the platform and kept the tent pretty well filled until close on the time, the consequence being that the preparatory work had to be done in the face of the audience brimful of fun, and consequently jests and sarcasm were the order of the day (or evening) while the screen was being tacked on the frame.

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I WILL say this for the lecturer, when once the lantern was fairly started he soon had the ear of the audience, but for the operator, while getting the lantern at the right inclination and arranging the light, it was a bad quarter of an hour. This sort of thing could be avoided if the management provided the screen or advised the lecturer that all must be prepared before any portion of the entertainment commenced, in fact, that an interval could not be readily arranged for.

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WITH hand cameras becoming more and more popular, enlargements will be largely resorted to for successful "shots," and the optical lantern in some form or other employed for this purpose. To secure really good definition an illuminant of small area is required, condensers as free as possible from spherical aberration, and objectives of good quality and suitable focus fairly well stopped down. In many instances, commercially sold enlarging double con-

densers are not at all suitable for the purpose, for they are far too short focus for the diameter of each lens singly, and consequently, when in combination, considerable distortion is the result. Then, again, the oil lamp has too large a flame to get sharp definition unless specially arranged with a diaphragm in front, or is of poor illuminating power when being fitted with a narrow wick, and so limelight or the electric arc lamp have to be relied on for first-class work.

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The definition from the electric arc lamp, when used in connexion with a good optical system, is far superior to any other artificial light, and is far more rapid, for not only is it three times as intense as the best light otherwise known for this purpose, but permits of the objective being used with larger-size stops or full aperture. It is well known that the very fine enlargements produced commercially are obtained from electric-light illumination, and the majority of process work depends upon this light. With a simple and efficient arc lamp within every one's reach (where electric current is accessible), professional and amateur should be in a position to experiment with the production of photographic process plates or blocks, and help to improve this as they have done other branches of photography.

G. R. Baker.

HOW TO USE THE LANTERN FOR CLASS PURPOSES.

For some years past I have had my mind earnestly bent on the use of the lantern for educational purposes. Its power as an instrument of instruction can, in my opinion, scarcely be exaggerated. It needs only to be known how simple, easy, and rich in results it is, in order that it may be universally adopted.

When persons are recommended to use the lantern, they think it so difficult, so complicated, and, in fact, so magical, that they dare not attempt to work it. This is a great mistake, and the first obstacle to its general use. It must, therefore, at any cost, be overcome.

To my mind, the lantern is the simplest and easiest of all instruments to use. I do not think it possible for any person, no matter how unskilful, to fail at it. It is not near so difficult to manipulate as the globes, or even as the blackboard. It requires no power of drawing. In fact, in order to use it, you have only to light a gas jet or oil lamp, place it in a certain well-defined position, and move a lens a little backwards and forwards. It does the rest. You then take a slide, turn it upside down, put it in the place prepared for it, and immediately the image is on the screen. Nothing could be simpler. This is the all-important point, for, until it can be shown that it is very easy and inexpensive to use the lantern, it cannot be expected that it will be very generally taken up by teachers.

The advantages to be derived by the use of the lantern are very great indeed. Some eminent educational authorities, as Fitch, Abbott, and Sidgwick, lay the utmost stress on the use of the blackboard in teaching. But what is the blackboard in comparison with the lantern? Think only of the interest and attention excited by the luminous picture. Every eye is turned towards it. Every ear is open to hear about it—it dwells indelibly in the memory. Think of the size and brilliancy of the picture, so that all can see it. Think of the saving of time (the image is produced in an instant); the picture requires no blotting out; once done, it is done for ever; it is not like a blackboard diagram, that may require half an hour, or an hour, each time to produce it. Then, again, see how inexpensive is the material—a lantern will not cost as much as a good blackboard or slate, and only about as much as two diagrams.

Besides, by means of the lantern you can show things that could not be produced on the blackboard, or in diagrams at all. You can show most complicated drawings; the latest designs in machinery, objects that it would take hours to reproduce in chalk, &c. You can show even living animals in motion, chemical processes and philosophical instruments, and experiments in operation—*v.g.*, decomposition of water, the electric telegraph, crystallisation, &c.

Any person that thinks on the subject must, I imagine, determine at once to make use of the lantern, if only it is possible.

I now proceed to show how easy it is for any one to work the lantern. For a successful lantern exhibition four things are necessary—a good lantern, a good light, good slides, and a knowledge of how to get an image.

I. First, as to the lantern. I should recommend a person not having much money to expend (which I take it is an ordinary case with teachers) to buy a really good single lantern. There is, in reality, no necessity for two lanterns for school work; everything that you want to do can be done with one. Now, a first-class single lantern, with a three and a half or four-inch condenser, and an excellent front lens, can be got for 1*l.*, or, at very most, for 2*l.* Should a person wish to expend less, the nozzle alone can be purchased for about 10*s.* 6*d.*, and the cases can be made by themselves. Of course, good lenses are the all-important point, and these are fairly cheap; it is the mounting, &c., that is expensive, and it adds nothing to the picture.

II. Secondly, for a good light. Well, a good oil lamp, with two or three wicks, works excellently; and this is generally supplied with the lantern for the above-mentioned price. It is easier to keep the two wicks properly trimmed than the three; and they answer very well if placed at a proper distance from each other. It is well to keep in mind that very large pictures are not required in teaching, but that a picture from three feet to six feet in diameter is amply sufficient. Hence there is no need for very powerful illumination.

Should a person be within easy reach of gas, nothing can be better than a good Argand burner—in fact, it is the light I have myself decided to use for class purposes, after having made trial of everything. Gas has the inestimable advantage of being ready at all times, at a moment's notice; of requiring no care or attention, not even to trim it; of requiring no labour or skill. All you have to do at any moment is to light a gas jet, and your picture is on the screen. This is the all-important point, and, in my opinion, too much stress cannot be laid upon it. Till it can be shown beyond a doubt that there is no difficulty whatsoever in working the lantern—that even the most inexperienced person can use it—it is in vain to hope for its general, constant, and systematic employment in teaching. My idea is that it should do nearly all the work of the black-board, and a great deal more.

If any one is so fortunate as to have the electric light at their disposal, either in incandescent lamps or in the form of good, steady arc lights, it gives most brilliant pictures, and requires but little preparation. The limelight is exceedingly good if well set up once for all; but, in general, I think it requires more skill to manipulate it than the ordinary teacher is likely to possess. However, let us always remember that a very brilliant light is not required. Much confusion is caused by speaking of the candle power of a lamp for lantern purposes. What we want is not a large luminous flame, but rather a brilliant spot of light.

No matter what the light we employ, its efficiency will be very much increased by the use of a good reflector.

III. The next important point to see to is how to get good slides. On this depends, to a great extent, the utility of the lantern as an educational instrument; it is so easy to obtain the most varied assortment of pictures on all subjects. The first means of procuring good slides is to purchase them for about 6*d.* or 1*s.* each, in place of paying 12*s.* for a diagram. Large collections from which to select are formed by instrument-makers.

2. Prepare your own slides if possible. This is what really bestows the greatest value on the lantern; for you can have such an endless variety of slides on all subjects. But, you may ask me, How are you to prepare your own slides? If you can use a camera, photograph the objects, and throw the negatives on the screen; or, better still, make transparencies of them. If you cannot, then get some friend of yours to do so (every one can photograph now); or, as a last resource, get a professional photographer to do so. He will make a slide of any object for 6*d.* or 8*d.* This method gives us extraordinary power and resource. By its means we have all books and great drawings in periodicals, journals, &c., at our command (as far as copyright will allow). No person can believe what a boon the lantern is till he begins to use it after this manner. Thus, for about 1*l.* a year, you can secure as many as three dozen diagrams, that can easily be stowed away in a small place. Then you can, perhaps, exchange these, or get a loan of 160 for 4*s.*

3. Should one's funds not be able to reach such luxuries, they will at least be able to secure "gelatine films," or clear celluloid films, and nothing can be better. If the picture or drawing that you wish to exhibit is already small enough, then all you have to do is to place the gelatine film over the drawing, and sketch it out in Indian ink, as you would copy a plan on tracing paper. It is then ready for the lantern. Should, however, the original be too large or too small, you have only to reduce or enlarge it, and then copy it as before. Or you may be able to sketch it direct on to the film. This is the cheapest of all methods, and it has one extraordinary advantage, namely, that you can copy in, in various coloured inks, even the finest works, and so produce beautifully coloured slides. Judson's

dies suit admirably for this purpose, and can be worked with a fine pen.

4. The last means of showing very good pictures on the screen is by throwing the images of the objects themselves on to the screen. This is easily done by placing the objects between the light and the screen, and then focussing their images with an independent lens. This method serves excellently for showing experiments in heat, light, sound, electricity, chemistry, &c.; also for showing insects, flowers, lace, needlework, &c. And here I should like to say a word in favour of having a low-power microscope attached to the lantern, as it increases its power very considerably, and is just as easily worked.

IV. I now come to treat of the last condition necessary for the successful working of the lantern, viz., how to get a good image. Here I must enter into some minute detail, as it is the only point that presents any difficulty. Let a beginner, then, follow closely all these directions. I may say they are never given in the books which profess to teach the use of the lantern.

First, then, place your light so that the centre of the flame may be as nearly as possible opposite to the centre of the condensing lens, and about two inches behind it.

2. Adjust the focussing lens, so that about one-half of it is inside the tube, and one-half outside. This gives most play for adjustment.

3. Now, put in your picture—upside down, of course—and move the front lens in and out of its tube, till you get the best rough picture you can on the screen.

4. When this is done, move *back* your light in the lantern, in a straight line, till you get the brightest picture. Then fix the light in that position.

5. Next see if the picture is equally illuminated everywhere, especially at the sides and edges. Should there be a dark edge towards the top of the picture, then *raise* the *light*. Should it be at the bottom of the picture, lower the light. Should the dark edge be at the right-hand side, move the light to the left, &c. These directions are exceedingly simple, and yet by following them well, once for all, and putting your lantern and light into position, you need never change them; and, when you wish to throw a picture on the screen, you have but to light your gas jet or oil lamp, and all is ready.

N.B.—In order to perform the operations spoken of in No. 5 with still more ease, you might, perhaps, take out the picture altogether, and merely have a disc of light on the screen, and work at it in manner described above till you get a clear, uniformly lighted disc without any dark edges, &c.

V. And now I may be asked for what subjects is the lantern suitable? Well, I am tempted to say at once for *all* subjects—especially for every subject, the teaching of which is improved by drawings, models, diagrams, pictures, &c.; and what subject is not so improved? Every person giving a lecture now—no matter what his subject may be—even Wagnerian music—must have the lantern.

To mention only a few, the lantern can be used with great effect in teaching history, geography, music, drawing, needle-work, lace, natural philosophy, chemistry, physical geography, geology, botany, astronomy, classics, mathematics, English literature, and composition, and even religion.

Of course, it would occupy too much time and space to show how the lantern can be applied to each of these, but I shall just refer to a few.

Think of the immense power of the lantern in teaching history. All our histories nowadays are being illustrated. We have Knight's, Cassell's, Greene's, Gardener's, &c. Now, what would be easier than to get slides from these—either photographs or sketches—and what interest would they not give to a lecture? Old houses, old towns, old castles, great personages, and great battles, picturesque costumes, &c., all would be at your command. These, in the hand of a good teacher, would speak infinitely more to young minds, and leave a far deeper impression on them, than the most vivid descriptions in words.

Again, in geography, the lantern brings within our reach the most rare and expensive maps. Maps that would cost from 30*s.* to £6 can be reproduced for 1*s.*—and cast on the screen—you can enlarge them or make them small at pleasure. In this way you can have physical maps or orographical maps, &c., you can even lay Reclus or picturesque Europe under contribution.

This is all very good, but you may ask, How can the lantern be used in the teaching of classics? Very easily indeed. We know the rage that exists at present for the study of antiquities—we know how necessary it is to study ancient life and customs if we are to understand the past. Here, then, by means of the lantern, we can reproduce all the discoveries made at Pompeii or Troy, all the illustrations in Guhl and Köner's *Lives of the Greeks and Romans*, &c. In fact, I am afraid to say all it can do; I am only opening up fields of thought for the teacher, that each one may cultivate for themselves. But, you will say, surely the Lantern cannot aid us in the teaching of literature and composition? In no department, I am inclined to say, is its aid so beneficial. What is more prized than the great illustrated editions of the poets, dramatists, and even prose writers? What can enable young people especially to realise and relish these works like the pictures of great artists, which make the figures live on the canvas. Thus can we reproduce the scenes of Scott as portrayed by Turner, of those of Shakespeare as presented by Frith, &c. I can scarcely conceive anything more elevating and inspiring. We may even go on now with the Lyceum album to reproduce the scenes as represented on the stage by Irving. But even the shortest poems suit our purpose admirably. See how beautifully illustrated is Longfellow's "Village Blacksmith," "Ye Olden Time," "The Wreck of the Hesperus," &c.

Lastly, I must say a word for composition. Many will know how fond the French and others are of showing pictures of various persons and scenes in order to teach composition. The master shows the pupils a picture, teaches them to observe the various points in it, asks them questions regarding it, asks who are the persons engaged in the scene, what is each doing, what is the expression on each countenance, what do you think of their acts, &c. Even in their composition books the French have a number of these pictures. There seems scarcely any better way to teach pupils how to think and to express their thoughts. Now, see what a power the lantern gives in this direction; you can choose any subject, put the picture of it on the screen, and then study it with the pupils.

Rev. R. C. Bodkin, C.M.

Note.—Perhaps the best light is the incandescent gas with mantle.

ETHER SATURATORS.

[Photographic Society of Philadelphia.]

When I patented the method of producing the limelight, which consists in passing a portion of the oxygen through a chamber having a porous filling saturated with ether or benzine in order safely to obtain a substitute for hydrogen or coal gas, I made certain claims for the ether light and porous saturator which were soon generally recognised in this country, but have always been disputed by some well-known authorities in England. One was that, with the saturators made and used according to my instruction, the oxygen passing through the saturator was so completely saturated with ether vapour as to be non-explosive, so that it could be turned out exactly like a coal-gas flame, without danger of snapping back, even at the close of an evening's exhibition; another, that with the same pressure of oxygen the light was better than with coal gas, the consumption of oxygen being proportionately greater, the incandescent spot on the lime proportionately smaller. These facts were not only proved by my own experiments, but were confirmed in tests made by professional limelight operators, and also by most careful quantitative tests made by a noted physicist in the physical laboratory of one of the best known of American universities, employing the most approved gas meters and photometers, and checking the possible errors by interchange of jets, &c. Under the conditions which I laid down, and with such jets as I employed and recommended, we found it impossible to obtain any other results—all of the tests turned out alike. English writers, with a reputation for honesty and capability which their work in other directions evidently sustained, denied that the porous saturator could be relied upon to produce a non-explosive mixture of oxygen and ether vapour under ordinary conditions, or that the light was even better than the oxyhydrogen with the same jets and oxygen pressure, or that the incandescent spot was smaller for a given amount of light. The claims that I made are not even now generally recognised in England, where, although everybody who uses the ether light has finally adopted the porous saturator, which has assumed new forms, it is almost invariably used in connexion with a source of heat to assist the vapourisation of the ether, and I believe nobody admits that the light is quite equal to that obtained with the two gases. I was a good deal puzzled, and somewhat discouraged, to find an apparent exception to the rule that "truth is mighty," &c., until I had an opportunity to make some tests with the ether light in England, with English jets and saturators. These tests resulted exactly as described by the English writers. At the usual temperature of a lecture-hall in London an ordinary ether saturator, not kept warm by some special means, would not, after an hour or two, give a non-explosive mixture of oxygen and ether vapour, the incandescent spot on the lime was quite as large, if not larger, than with the two gases, and the light was distinctly inferior. That was the first time I ever had such an experience with the ether light, and the object of this communication is to point out the reason for the differences observed, and to make some further observations upon the subject.

Briefly, then, the ether saturator does not always saturate in England without being warmed, because the usual temperature of lecture-halls is

quite ten degrees lower there than here. This difficulty could have been got over by substituting for sulphuric ether the lighter petroleum ether, the use of which I introduced here; but petroleum ether is not in such common use, nor so easily obtained, in England, and English operators do quite right to use "warm-air" saturators with sulphuric ether at prevailing temperatures. The English operators generally employ jets having large mixing chambers filled with gauze or pumice, and having conical brass nipples. With such a jet I found it impossible to obtain a properly focussed flame, the gases spreading out over a large surface of lime, and making a very diffused incandescent spot. My own jets have a small mixing chamber, but no obstruction of any kind behind the nipple, which is a steel gun nipple as used by many manufacturers in this country, and the flame focusses to such a small point that about 30 per cent. of the light is lost if the lime is no closer to the nipple than is necessary to give a first-class light with coal gas. With these jets, and the lime turning so close to the nipple that it almost touches, the ether light, with the same pressure of gas, is better than the oxyhydrogen, and the incandescent spot is smaller, with a greater consumption of oxygen. The differences have been explained, and both of us were right, both were wrong.

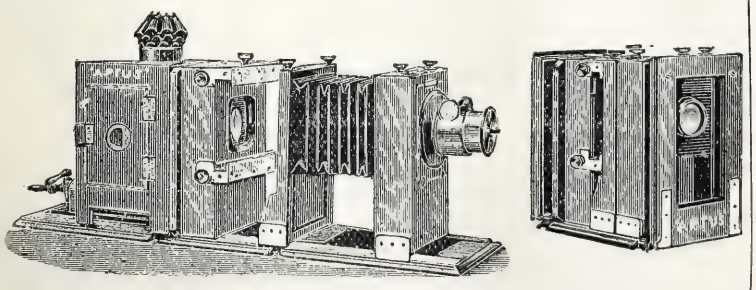
The earliest form of "warm-air" porous saturator introduced in England, that of Albert Scott, possesses no advantage over the "cold-air" saturator for use in this country; but is more troublesome to manage, and possesses the disadvantage that no means are provided for removing the porous filling, which should be dried out occasionally when used with sulphuric ether. Some of the more recent "warm-air" saturators, however, possess one feature which might advantageously be introduced into this country; they go directly into the lantern, where they are not only certain to be kept warm even in the coldest room, or out of doors on a winter's night, but they are more compact and less in the way than the tubular form. None of them are provided with means for removing the porous filling, which, as I said before, is an objection for use with sulphuric ether, but it need be no objection to their use in a country where suitable petroleum ether, both better and cheaper than sulphuric ether for the purpose, can be readily obtained. In my opinion the best of these inside-lantern saturators yet produced is that of Perken, Son, & Rayment, Oxford-street, London. It is really an Ives's saturator, made square instead of tubular, but without the removable end, and has an upright rod for attaching the jet. It will not become unduly heated in the lantern, as some of the others might, and it is a model of compactness and convenience. I think so much of it that I have adopted it for my own use, and modified my folding lantern so that it fits into it for carrying. I now show you the folding lantern, as substantially made as the largest you can find, with eleven-inch focus objective and extension for long-distance work, ether saturator, jet, tubing, and connexions complete, and measuring only $6\frac{1}{2} \times 7\frac{1}{2} \times 10\frac{1}{2}$ inches outside.

In conclusion, a word about petroleum ether. Before the days of the Standard Oil monopoly, purified gasoline, known as petroleum ether, could only be obtained from a few dealers in bottles, at about half the cost of sulphuric ether. Now, however, thanks to the "monopoly," if I am correctly informed, all of the gasoline sold is quite free from gummy matter and suitable for use in the ether saturator. F. E. Ives.

THE APTUS SCIENCE LANTERN.

Sharp & Hitchmough, Liverpool.

On page 397 of the Journal for June 22 will be found a description of Messrs. Sharp & Hitchmough's new science lantern as shown by Mr. H. B. Sharp. The illustrations show it open and closed.



The lantern is made of walnut or best polished mahogany, has two panelled and moulded doors, moulded base, brass-bound sight holes with revolving shutters, japanned dome, and rose top, bellows front, long extension for lenses of all foci up to 12 inches, taking lenses of various diameters, $4\frac{1}{4}$ inch plano-convex and meniscus compound condenser. It is specially designed for public and private exhibitions of the highest class. The objective is a double combination achromatic 2-inch diam. in loose cylinder, and fitted with flasher and slot for tinters. The body or jacket has double pinion to rack adjustment. The outside measurement of the lantern as shown when closed with objective is only $9\frac{3}{4} \times 9\frac{3}{8} \times 6\frac{1}{2}$. It is fitted with new adjustable stage for centering carriers of all sizes. The baseboard, when opened out, is self-locking and very rigid. It weighs, with lens and condenser, 11 lbs. Other lanterns measure $9 \times 8\frac{1}{4} \times$ by 11.

For science purposes, and indeed for all lantern purposes, this lantern will be found thoroughly efficient and reliable. It is fitted to take Lawson's Saturator, but may be adapted for the ordinary limelight.



SHARP & HITCHMOUGH'S RETOUCHING DESK.

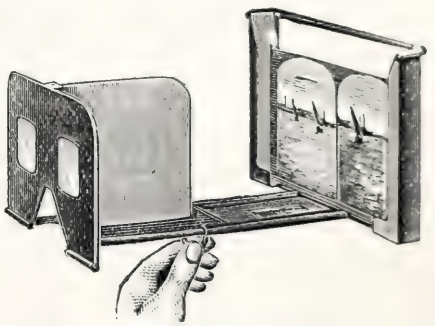
Messrs. Sharp & Hitchmough, of Dale-street, Liverpool, are making a speciality of a new retouching desk, which has some novel points.

The negative is held under the spring disc in any desired position, all light being blocked out except that passing through the portion being worked. A tinter is provided to ascertain the colour and density of pigment before applying to negative.

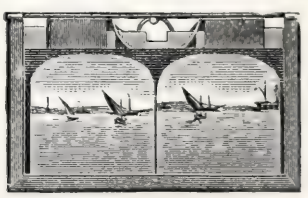
THE "COMPACTURE" STEREOSCOPE.

T. Aston & Son, Birmingham.

The Compacture stereoscope is distinguished by neatness and portability. As shown in one of the cuts, it can be folded up into a box-like



shape, seven inches long, four and a quarter inches wide, and three quarters of an inch thick, holding a dozen or more views. It has no



loose or separate parts. When folded up, the lenses are protected from being scratched or damaged.

It is made of bronze metal, and is therefore not likely to get broken.

It can be used for either slides or transparencies, and is provided with a focussing slide to adjust the picture for different sights.

The Compacture is very cheap, and we have found it an efficient instrument for the examination of binocular views. Its construction is fully seen from the illustrations.

HONOURS FOR AN AMERICAN MAKER OF LANTERN SLIDES.

At the June meeting of the Photographic Society of Philadelphia, Mr. George Vaux, jun., Chairman of a Special Committee, submitted the following report in regard to a set of lantern slides and photographs by Mr. W. H. Rau:—

"Your Committee appointed at the May meeting of the Society to consider what means should be taken to show Mr. William H. Rau the appreciation, by his fellow-members, of the technical skill and artistic beauty of the set of lantern slides of views in the western parts of the United States and Dominion of Canada and of the loan collection of prints in British Columbia which for the past month have graced the walls of our meeting-room, respectfully report:—

"That they have given careful consideration to the matter referred to them. The time occupied by the tour was about eight weeks. The whole number of exposures made by Mr. Rau on this trip was seven and a half dozen 11 × 14 and twenty dozen 6½ × 8½ plates, of which seven dozen 11 × 14 and about seventeen dozen 6½ × 8½ produced satisfactory negatives.

"Your Committee believe that this was a most unusual achievement in photography, in view of the very great distance travelled, being an average of nearly 1000 miles a week, when the universal excellence of the technique of the pictures is considered. But this collection of views is the more commendable because, in addition, in our estimation it embraces a selection of pictures exhibiting true artistic feeling and a keen appreciation of the canons of composition, the proper application of which makes the contrast between a photograph and a photographic work of art. We believe that the great majority of Mr. Rau's views referred to above come up to this high ideal, and we therefore recommend that the Society adopt the following preamble and resolutions:—

"Whereas, our fellow-member, Mr. William H. Rau, has recently exhibited to the Society an unusually beautiful set of lantern slides, and also a collection of prints, all from negatives taken by himself last summer in British Columbia and the north-western part of the United States, combining alike the highest grade of technical excellence with artistic taste and skill of the highest grade; therefore be it

"Resolved, That the Photographic Society of Philadelphia award to Mr. Rau a silver medal as a token of its appreciation of his work for the advancement of photography.

"All of which is respectfully submitted."

RELATIVE SPEEDS OF LANTERN PLATES.

A list of the proportionate exposures needed with the various lantern plates in general use will be found useful for reference. Starting with the Ilford Ordinary, usually employed for negatives, as having a value of one, the figures attached to the others represent their relative speed as compared with it:—

Ilford Ordinary	1	Imperial Special	2½
Ilford Special	6	Imperial Slow	9
Paget Rapid	2½	Thomas's	17
Paget Slow	12	Mawson	7
Edwards's	12	Hill Norris	4½
Cadett	12		

Photographic Record.

MATTING SLIDES.

'The improvement made in the majority of lantern slides by matting down," says "J. C.," in the *Canadian Photographic Journal*, "is becoming more and more impressed upon slide-makers. Very few slides shown with a narrow matt but would be vastly improved by the use of wider matts.

"A great many slides, too, seem to be matted on the 'just-as-they-come' principle, without any seeming consideration as to the style of matt most suited to the nature of the slide. A monstrosity in a large square opening can very often be changed to a picture by the use of an oval matt of half the opening.

"A leading photographer, noted for his artistic photographic *pictures*, when asked to give the secret of his success in securing so many charming little bits, answered, 'I boil them down by clipping.' The free use of the trimming knife is one of the most necessary and often one of the hardest things for the amateur, and professional as well, to learn; but it must be thoroughly learned and practised before anything like continued artistic, or even satisfactory, work can be hoped for.

"The same holds good in lantern slides—matt out everything that does not add to or form a necessary part of the *picture*, even if in so doing you have only a square inch left. Better a square inch of gold than a square foot of brass."

A PLEA FOR SERIOUS WORK.

In the course of a recent address to the Society of Amateur Photographers of New York, Dr. J. H. Janeway said: "If we are not all born artists, must we give it up without a struggle—for we know not what we are, until we try, and try carefully and thoroughly? If we fail in landscape, *genre*, portraiture, and become satisfied that we never can succeed in these branches of photography, we need not cap the lens or throw away the camera because of our failure in these, for there are many another field as useful, beautiful, and pleasing as those mentioned, and towards which we may give our most earnest thought and careful work. A photograph to come within the sphere of art, as one of the principal things, must either tell a story, please you, set you to thinking, or make you wonder; often it will do more than one of these. The point where the picture passes from the mere mechanical, material production to a picture is just where the right treatment is given it. In one you are attracted to the physical, in the other to the idea. The picture-maker speaks to you in his work, he makes you feel the beauties he has felt. The serious, earnest worker will strive to do the same with his camera and developer, he will try to reproduce what he has seen and felt, telling the story and endeavouring to bring you in touch with the sensations of pleasure he has experienced. He will avoid all tendency to secure 'all out doors,' a fault with many, and he will also avoid what is called 'effectiveness,' in order to secure which there must be a sacrifice of all rules of art, and which eventually will teach the public to look for false qualities in photographs and overlook the good ones.

"As a good all-round worker is seldom met with, to ensure success, is it not well to ascertain that which you have aptitude for, and work at this with all your will, for to follow irrespective of your inclination the particular kind of subject in which others have achieved success will not give you satisfaction? Learn of all, but lean on yourself, is a good rule, and in doing so you will feel more satisfied with yourself and with your work, and you will certainly be laying the foundation of future success.

"The other branches of photography which I would earnestly recommend to you for serious work, are, 1st, The Sky—by day and night—Clouds. Previous to the introduction of orthochromatic plates and yellow screens, there was considerable difficulty in obtaining satisfactory cloud effects, but, thanks to their introduction, this difficulty has been materially overcome, and by Burchett's happy luck (the use of a green screen behind the front combination and a yellow one in front of the rear one of the lens), clouds may be obtained with but little trouble and in infinite gradation. So light, so evanescent, the despair of the painter, the dream of the poet, and until recently impossible for the meteorologist to describe, now those clouds so delicate, so white, so changeable, which are called 'cirrus,' are depicted with as much fidelity as the coarsest nimbus. It is not merely for the obtaining of cloud effect that I advocate this branch of photography, but for its importance in a scientific view, and for the assistance that it bids fair to give to the study of meteorology. And then at night we have the whole heavens to point the camera at, and thus explore the mysteries of other worlds than ours. By a paper read to-night you have been told that stellar photography is by no means a difficult field to explore or requires an expensive and cumbrous apparatus. Consider the marvellous possibilities of astronomical photography and its immense importance, and think if it is not worth our while to devote some of our time to this pursuit. Photography of the electrical disturbances as evinced by the Northern lights, and lightning, best pursued at night, is recognised by scientific men as of the greatest importance, and there has been expressed a strong desire by them not only in this country but abroad for as many results as can be obtained by this branch. The late Prof. Tyndall expressed great pleasure and lively interest in some photographs sent him by a member of the Philadelphia Society shortly before his death."

Correspondence.

GAS CYLINDERS.

To the Editor.

Sir,—I am pleased to note that Mr. Murray confirms my opinion that too much has already been said about the Bradford accident, although he discounts that dictum to some extent by contributing another column or so upon that occurrence to the last number of The Lantern Record, a fault he shall not find with me.

My article which he attacks is simply an elaboration of his own opinion which I quoted therein, and which I will again quote. "The long record of immunity from accident . . . . is the best possible evidence of the fact that proper precautions have hitherto not been neglected." For holding such an opinion I may be "foolish" and "optimistic," but I do not intend to do penance for my heresy (a belief in the efficacy of the goods supplied by Messrs. Brin for some years) even if Mr. Murray chooses to recant.—I am, yours, &c., James Lewis.

[This matter here terminates.—Ed.]

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*September 7, 1894.*

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

THE Photographers' Association of America's Convention at St. Louis appears to have been a great success, in a social sense at any rate. The lantern, however, went wrong, according to *Anthony's Bulletin*. "The parties who mismanaged the optical lantern at the instructive session," says that journal, "should take a few lessons before making the attempt again. Three minutes after the commencement of the exhibition of slides the lower lantern went out and did not return, and two minutes later the condenser of the upper lantern cracked. This stopped the 'criticism-of-work' part of the programme. Nothing but carelessness or lack of acquaintance with the lantern could have caused such mishaps. Next time let the lantern be managed by a professional operator." This, as the familiar locution has it, is decidedly "rough" on the lanternist. For all that, we should like to hear the lanternist's version of the matter.

* * * * *

AT the meeting of the Royal Photographic Society on Tuesday, August 28, Mr. Birt Acres showed a rough model of a new magazine lantern-slide changer which he has patented, and which, we believe, will shortly be placed on the market. The principle utilised is that of placing the slides in the "hopper" outside the lantern, the changing being effected by simple mechanism in the attached carrier. The details of the idea are very ingeniously carried out, and the slide-changer should be a handy lantern adjunct.

* * * * *

ON the same occasion, Mr. R. R. Beard gave an address on *The Lime-light*, describing the various jets in use from a period of ten years ago to the present time. After ascribing the origin of the oxy-hydrogen limelight to Lieutenant Drummond, who used a safety jet, which Mr. Beard illustrated and described, he said that with the ordinary safety jet (old form) a very good light was obtainable. He remembered Mr. York using it several years ago with great success.

* * * * *

IN a safety jet of the present day, continued Mr. Beard, the oxygen nipple was often enclosed in a **Y**-piece. The effect of this was that in shutting off the oxygen the hydrogen found its way into the oxygen tube, which thus became full of the mixed gases, which "popped" when the light was turned on. In a biunial this effect was very marked. This jet was further improved by having a movable nozzle fitted to the oxygen tube, which gave a better result than the separate jets, but not so good as the mixed.

THE various forms of mixed jets were next described. The old theatre jets in which the gases were admitted to the mixing chamber at an angle even sometimes now gave the best results. For the ordinary lantern jet they were indebted to the late Rev. T. Frederick Hardwich. Mr. Beard gave preference to that form with a parallel mixing chamber fitted with perforated discs, the perforations being irregularly placed. Such a form, he said, was easily made, and produced good results.

* * * * *

AFTER speaking of the various kinds of limes obtainable, he said that jets used with saturators should be a little different to the foregoing, the jets being sufficiently packed to prevent the egress of an explosive mixture into the saturator. Recently he had run a saturator dry, and had got an explosion. This could be prevented by packing the mixing chamber with powdered pumice and gauze. No back flame would then result. Coming to the gas question, he said that some kinds of hydrogen in cylinders deposited a black substance on the lime which destroyed the brilliancy of the light. He had tried benzoline saturators of wash-bottle form, which saved both the lime and the gas, one-third of the deposit being obtained as against that from the gas from the cylinders. To make matters worse, impure oxygens were in the market. Mr. Beard concluded an interesting little talk by saying that it would be well if there was a method available for ascertaining the relative candle power of the various forms of the oxyhydrogen limelight.

* * * * *

IN the course of the discussion that followed Mr. Beard's remarks, Mr. T. Bolas said that he frequently used Hemming's jet for laboratory purposes. The chamber of the jet is packed with metal wires, and Mr. Bolas said he used mixed gases from a bag. A small solid flame was obtained with the jet, which Mr. Bolas thought would compare favourably with the blow-through jet, the small flame being a measure of its efficiency.

* * * * *

MR. T. E. FRESHWATER also made a few remarks, in the course of which he agreed with Mr. Beard that the best mixing chamber was one having a series of perforated discs. It was also important that the internal bore of the nipple should be smooth, so that there was no resistance to the gas. We gathered from Mr. Freshwater's remarks that Messrs. Newton are bringing out something new (and cheap) in the way of jets.

* * * * * *

SOME discussion then took place on the proneness of house gas and of hydrogen in cylinders to discolour the lime. Mr. Beard observed that he had recently used some coal gas, which had been in a cylinder for two years, that did not discolour the lime, whereas a more recently filled cylinder of gas had the opposite effect.

* * * * *

FOR ascertaining the relative light-giving values of the various jets, Mr. H. A. Lawrence suggested the employment of the Bünsen photometer.

Dr. A. Clifford Mercer, of Syracuse, N.J., who was present, said that in his city the cost of the gas for an ordinary lantern lecture of, say, two hours' duration would be about 12*s*. The use of the electric light could be obtained for much less.

* * * * *

Mr. Andrew Pringle, who was chairman of the meeting brought the discussion to a close by remarking that he had that day been using Perken, Son, & Rayment's saturator for four or five hours, and had scarcely consumed ten atmospheres of oxygen from a forty-feet cylinder in that time. As to the use of limes, he said that probably we had got to the maximum incandescence we could produce from a given substance. We must therefore look for a better substance than lime. He himself had experimented with other substances, such as magnesia and zirconia, and had found that, on account of their destructibility, they were practically unusable. Again they had to draw the line at noise. He didn't object to a murmur, but a hiss created discomfort.

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Alternate discs in the mixing chamber, said Mr. Pringle, were undoubtedly a great gain, and constituted the last and greatest step that had been made in connexion with the limelight.

* * * * *

Saturators came in for a little criticism at the hands of Mr. Pringle. In the first place, he asks why, when using a saturator, the nipple had practically to be larger than when using a jet? He had tried a small orifice in the nipple and got a bad result. Again, he did not see why a saturator should require packing, and he mentioned the circumstance that he got a degraded form of light with all saturators, the light being of a reddish colour. We should be glad to have the experiences of saturator-users on these points. We may add that Mr. Beard received a well-merited vote of thanks for opening the discussion, which proved full of interest.

LANTERN SLIDES BY THE CARBON PROCESS.

In making the exposure it is scarcely necessary to remind my readers that some kind of actinometer will be needful in order to secure accuracy as well as uniformity of result, as the examination of the tissue forms no guide as in the case of ordinary positive printing. Strict accuracy in toning is not, however, of such extreme importance in the case of transparencies as it is with a picture on a paper basis, as slight variations from the absolutely best exposure only result in corresponding variations in density, which are not nearly so noticeable as similar differences in the depth of printing of paper pictures. Still it is desirable to be as near the mark as possible.

There are several forms of actinometer specially made and sold for use by carbon printers, but a very efficient instrument can easily be made by superposing several different layers of thin, fine textured paper, so as to form a graduated scale, the several "tints" of which can be arranged to correspond with the printing values of negatives of different density. Or a very simple plan, and one that is quite accurate enough for transparency work, is to put out as a guide a negative of similar density to those being used for the transparencies, and make a print upon ordinary gelatino-chloride paper, which may be watched in the ordinary way, the sensitiveness of the two surfaces being nearly equal. Should there be any variations in the densities of the negatives in use, it is easy to mark these upon the frames, and to make allowance for them by giving a little longer or shorter time than to the "guides." Working in this manner, a single guide will answer for a large number of negatives.

It may be desirable, for the benefit of those not familiar with the routine of carbon printing, to say a few words on the subject of preparing the tissue for the printing frame, as it is not sufficient to just put it into the frame any how. In the first place a "safe edge," as it is called, is necessary—that is to say, the edges of the negative must be covered to the depth of an eighth of an inch, or so, with a margin of opaque varnish, or narrow strips of paper. This is required in order that the edges of the tissue may be protected from the action of light, and so remain soluble and *adhesive* when applied to the glass support. If acted upon by light, the surface of the tissue becomes insoluble, and repellent of moisture, and refuses to adhere properly to the support; if this occur at the edges, the whole of the tissue will curl up and leave the glass when immersed in warm water for development.

The safe edge is generally applied to the glass side of the negative when it forms a vignetted or slightly softened, instead of a sharp, line on the tissue, but it is not a matter of very high importance which side it is used. The most convenient safe edge I find for lantern slides is one of the ordinary masks inserted between the tissue and the negative; or, if prepared, it may be gummed on to an extra glass, and used in front of the negative.

The tissue must be carefully cut to size, a little smaller than the lantern plate, the exact size being ascertained from the extent the tissue expands when wetted. It must be such that, while it reaches on to the "safe-edge" all round, it does not swell beyond the margin of the glass when immersed in water; if it does, there will be great danger of the tissue leaving the supports during development or before it commences. It is worth while to devote a little care to this matter, not only for the reason just mentioned, but also in order that the image may be the more easily set square upon the plate, for it must be borne in mind that it is invisible until it is too late to alter its position on the glass.

The use of the mark as a safe-edge on the film side of the negative greatly facilitates the proper placing of the image, as if it be placed correctly on the negative, and the tissue, cut truly square, arranged symmetrically arranged with it, it is easily laid in position on the glass. Besides this, the pressure during printing forms an outline of the mask on the tissue, which can then be very accurately trimmed with scissors or a penknife after printing.

Before placing the tissue in the frame, it is desirable, if not indeed absolutely necessary, to ensure that no particles of dust or foreign matter are attached to the surface. For this purpose the tissue is laid face uppermost on a sheet of plate glass, and briskly polished with a soft dry cloth to remove any foreign particles that may have become adherent during the drying, or any crystals of bichromate that may have formed, all of which tend to the formation of spots and blemishes if allowed to remain.

All these little details—which look more formidable in description than in practice—having been attended to, the printing may proceed. After exposure, the development should be proceeded with as soon as may be convenient, for it must be remembered that the action of light continues to some extent after the tissue is removed from the frame, and that a print which would be properly timed for immediate development would be over-exposed if left over for twenty-four hours. This should always be taken into calculation when exposing, and some systematic arrangement be observed with regard to the time allowed to elapse between exposure and development.

Before developing the prints, the glass that is to form the final support requires preparation. It is first scrupulously cleaned, and is then ready to receive a substratum intended to cause the image to adhere firmly. It is quite possible to develop a picture on bare glass, but it is not easy, and, in addition to that, the finer details of the high lights are invariably lost. The substratum may consist of a layer of collodion, or, better still, of weak solution of gelatine, to which a little bichromate of potash has been added. This is spread upon glass, dried, and exposed to light for a short time. The coating, however, is troublesome, and the mixture frequently refuses to lie equally on the glass, running away in parts, as if the glass were greasy. Two far better solutions consist of albumen one part, to water seven parts; or, loaf sugar one part, to water twenty parts, each with about four grains of bichromate to the ounce. These are filtered perfectly clear, and, a few drops having been poured on to the glass, the solution is rubbed well into the surface, until any traces of "greasiness" disappear, then a fresh portion of the clear liquid is poured on in the same manner as collodion, and the surplus drained into a filter for future use. This leaves an extremely thin film of the organic matter in combination with bichromate, and, after exposure to light, the plates are ready for use.

To develop, have two dishes or trays containing clean cold water. Water from the main should invariably be filtered or strained to remove any solid particles; a couple of thicknesses of flannel or flanel-

ette tied over the tap will form an efficient filter. In one tray place the prepared glasses, and into the other immerse, one at a time, the pieces of exposed tissue. At first the tissue will curl with the prepared side inward, but gradually it will flatten out and eventually curl in the reverse direction. Before this takes place, but not until the tissue is quite limp, take one of the prepared glasses and bring the two surfaces together under water, carefully adjusting the tissue as already directed, so that it occupies its proper position on the glass. Lay the glass down on a level table, and over it a sheet of mackintosh, cloth, or stout paper, and go over it very gently at first with a soft squeegee, so as to avoid disarranging the tissue; after three or four gentle strokes of the squeegee, greater force may be used until the tissue lies perfectly flat and in intimate contact with the glass. It is then placed between blotting-paper for at least ten minutes, or the successive slides, as mounted, may be stacked up in a pile with blotting-paper between them.

If the tissue be insufficiently soaked before mounting, it will be difficult to get into contact with the glass; if the reverse be the case, it will show a tendency to curl backwards and peel off. In either case a prolongation of the time allowed to elapse between mounting and development will often prove a cure; indeed, for my own part, I prefer to leave the mounted tissue for twenty minutes at least.

The development is performed with water at from 100° to 110° Fahr. The mounted slides are placed singly in this, and when the colour commences to ooze out at the edges it will be found that the original paper support has become loosened, and it may be lifted by one corner and gently peeled away. If the tissue be newly sensitised and in good condition, it will come away perfectly easily; but, when old or partially insoluble, it oftens requires considerable force to remove it, and in such cases water at a much higher temperature will be required to complete the development. But under ordinary circumstances the best results accrue from gradual development at a comparatively low temperature.

When the paper has been removed, wash the surface of the glass gently, by throwing over it with the fingers or by rocking the dish, to remove the soluble coloured gelatine. At first there will be no trace of any picture, but only a smeary mass of black; gradually, however, as the gelatine dissolves, the image will appear, faintly at first by contrast with the mass of colouring matter, but gradually acquiring more vigour as the latter clears away. If the development appears to stop before the picture is clear, do not be in a hurry to use hot water, but allow it to soak at the same temperature in a separate dish while another image is being developed, when, on resuming the washing, the softened gelatine will come away readily. In this manner much finer results are obtained than by unduly raising the temperature, though, when all else fails, this may become necessary. I have a very fine carbon opal that actually required *boiling* to complete it. When the development is *apparently* complete, leave the plate to soak for some time in simply lukewarm water, and finally finish by pouring cold water from a jug. Many operators finish by aluming, but I have never found this necessary.

When dry, the transparency is ready to mount in the usual way; but, if there is any appearance of relief, it will be better to just give it a coat of good enamel collodion.

W. B. Bolton.

THE SEARCH LIGHT.

The winter season is upon us and in a very little while we may look for a renewal of activity in the lantern world. The employment of the optical lantern has spread among all classes of society for demonstrative, educational, scientific, and recreative purposes, and the signs of the times are all in favour of a still further growth of its popularity. How useful it may be made for purposes of conveying instruction in class may be understood from the Rev. R. C. Bodkin's excellent article on the subject in last month's Record. Mr. Bodkin is himself the Vice-President of an Irish collegiate institution, and speaks from a practical knowledge of the subject. Of the London Photographic Societies, the London and Provincial is earliest in the field with arrangements for lantern nights. From the programme which Mr. Everitt has got together for the next ten months I cull the following portions which relate to the lantern nights:—

September 13, Lantern Entertainment—*A Day at Winchester*, Claud S. Scott. October 11, Lantern Entertainment, members' slides. 18, *Polarisation of Light; its bearing on Photography* (accompanied by a practical demonstration with the lantern), Birt Acres. November 8, Lantern Entertainment, Mrs. Catherine Weed Ward. December 13, Lantern Evening, members' slides. January 10, Lantern Entertainment, S. J. Beckett. 24, *Photo-micrography*, with lantern illustrations, T. E. Freshwater. February 14, Lantern Entertainment: *The Far East*, R. P. Drage. March 14, Lantern Entertainment, members' slides. April 11, Lantern Entertainment, members' slides. May 9, Lantern Entertainment, members' slides. On the above nights ladies are specially invited.

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The Royal Photographic Society's Exhibition will be open from Monday, the 24th instant to November 14. I may remind my readers that lantern slides and transparencies are eligible for award. Monday, Wednesday, and Saturday evenings will be set apart for the display of lantern slides, the charge for admission being sixpence. I believe that Mr. R. R. Beard will, as hitherto, have charge of the lantern. The lantern nights at Pall Mall are always enjoyable.

* * * * *

"My friend Mr. White," of the Photo-chrom Zurich Company, recently gave me an opportunity of looking through a large collection of specimen pictures produced by his Company, and I could not resist being struck by the lifelike beauty of these charming photographs in colour. Without a word of exaggeration, the "naturalness" of the colouring is perfectly comparable to the colouring of the Lippmann pictures, than which perhaps I can say nothing more favourable. But the point I have in view in drawing attention to these photo-chroms, which I may say are really photographs in colours, is to suggest the adaptation of the process to the rendering of stereoscopic slides in polychrome. I do not know whether the process would be practically applicable in such a small size (half-plate being the smallest worked at present), but I can conceive of nothing more beautiful than a stereo-chromograph produced in such a manner. I make the company a present of the print for what it is worth. I am sure that binocular views in colours would be popular if they possessed all the wealth of artistic beauty that the single photo-chroms enjoy.

* * * * *

I have written and said so much on the subject of the stereoscope and stereoscopic photography during the last few months, that I am almost ashamed to write any more for fear, either of wearying my readers or of being accused of "harping too much on one string," as the condemned murderer said to the hangman. My excuse for once more referring to the subject will, however, be accepted as a valid one, namely, its intrinsic and increasing interest among so many photographers. It might be thought that the winter affords few, if any, opportunities for taking stereoscopic negatives, but I think I can point out a fertile field for the binocular camera when the long nights are with us, the comparative novelty of which should at least assure me the reader's forgiveness for again referring to a well-worn theme, even if the reason already given does not.

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There is before me, as I write, a stereoscopic slide, which was given as one of the illustrations of Eder's *Jahrbuch* for 1890. It portrays a drawing-room interior, the lady of the house surrounded by her children also appearing in the picture. As an example of stereoscopic at-home portraiture, which I have before now recommended photographers to take up, it is excellent; the binocular effect being very fine, and the picture being also good as regards exposure and lighting. But herein is the point of principal importance. This stereograph was taken at night time by means of the magnesium light, but it would be difficult to discover any radical difference between it and a picture that might have been produced by natural light. Here, surely, is scope for at-home portraiture, namely, stereoscopic work by means of the magnesium flashlight, by which

the most delightful effects could be obtained at comparatively little trouble or expense. This is surely worth taking up, especially by professional workers. This hint I also offer gratuitously to those to whom it is likely to be of service.

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"Upon the whole," says Mr. W. S. Bird, in *Autotype Notes*, "the 'Convention' has every reason to be satisfied with its visit to Dublin, and to remember with pleasure the hospitality received and the intellectual fare provided. Whether the annual occasion requires to be commemorated by a group of the members for publication in the journals is a matter of taste, the breach of the custom may perhaps be better than the observance." It would be a pity to abolish the group, for it forms an annual reminder of those who are the most important personages in photography, and these are not present in the Convention groups. RADIANT.

LANTERN MEMS.

What shall I say for September? I fear only "Holidays and Lantern preparation." With a view of seeing what was novel in the Continental lantern and photographic world, I included the Antwerp Exhibition in a little trip I made to Belgium, and the result, as far as these two subjects are concerned, is summed up in the word "disappointed."

* * * * *

Hoping to find the best French and German houses well represented by distinctive apparatus, with, perhaps, some decided novelty from England, I was not fortunate in discovering any speciality I could make a note of, but I may, of course, have overlooked it, although, in the day or so I had to spare for the Exhibition, I tried to find the various exhibits.

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One English house had an excellent collection of photographic and optical apparatus, but only one lantern among it, and this of the single form, with brass fronts and telescopic tubes of the orthodox pattern. It was in the outside shows and theatres that one saw something of interest in the way of projection, for the Exhibition proper was not open of an evening, the light being concentrated on the illumination of the grounds.

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Outdoor life is synonymous with Continental, and hence the gardens, cafés, and shows were patronised alike by provincials and strangers visiting the city. At one small temporary theatre, among representation of national dances, was the still popular serpentine dance, illuminated from the gallery in front with coloured lights, and an attractive effect given to the costume of another performer by placing incandescent electric lamps in ornaments, at the throat, body, and down the drapery of the dress, and intermittently illuminating them by making and breaking the electric circuit.

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It was in the City of Antwerp, however, that the best representation of the serpentine dancing was given, namely, at the Scala Theatre of Varieties, and here two projection electric light boxes were used on the stage, one at each side, and a most powerful light concentrated on the performer, the kaleidoscopic and coloured light effects being produced by a large transparent wheel in front of the light, and slowly rotated by the operator by hand. This wheel was, I think, double, so that the chromotropic design might be apparent, while the movement (always slow) was imparted by the other glass. With four performers dancing a serpentine waltz, and other innovations to vary this kind of entertainment, the audience were demonstratively enthusiastic.

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That this style of dancing is not only popular in England, but abroad, and optical assistance is required in the way of projection apparatus of a superior class, I observed that Miss Loie Fuller was announced to give a representation at the Theatre in Ostend, and had previously been in Paris, while in England, at the various higher-class theatres, electricity is being substituted for limelight illumination of stage and performers. In the case of the Fuller representation an announcement was made that electric illumination and special apparatus would be employed by Mr. Fuller, but, unfortunately, my plans were such for my trip that I could not devote any time in the evening at Ostend to inspect it. I feel, however, it was much the same as at the Scala, Antwerp, which was the finest illumination I have yet seen. I hear, however, that the London theatres will not for long be behind the Continental, for new apparatus is about being introduced of a greatly improved kind.

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Electric light projectors for photographic work and electric light signalling apparatus for military purposes were either exhibited or shown by illustration. In the latter case, a portable dynamo and road engine are arranged, so as to be mobile, and this kind of apparatus would be suitable for lantern demonstration in places where the electric current was not available. Of course, the initial expense would be considerable, but for a high-class exhibition of dissolving views, if well organized, it could, no doubt, be made to pay.

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An electric-light triple lantern, to be worked by one operator, has been successfully constructed recently by a London firm for use abroad in theatres and balls where the current is laid on, and it is so arranged that, where there is no electricity, the oxy-ether light can be used, ordinary mixed gas jets with all useful adjustment being adapted, and the Broughton-Hardwich form of saturator without top chamber, and with the partitions packed, answered excellently for the supply of all three jets, and permitted dissolving to be performed without any pops. G. R. Baker.

STEREOSCOPIC PHOTOGRAPHY.

[Journal of the Photographic Society of India.]

As stereoscopic photography is again attracting attention, the following may interest those who are anxious to work this fascinating process, which produces pictures imitating nature, and enabling us to see things, with a certain amount of roundness or solidity, and to realise the distances between objects in different planes, as with our eyes.

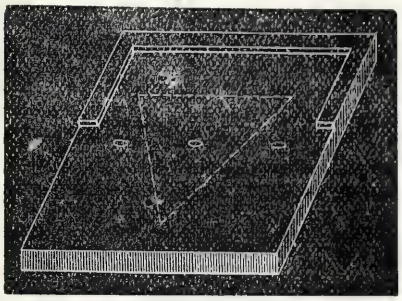
Our eyes are about two and a half inches apart from centre to centre, and though, when looking at an object, we but see a single picture, what we really do observe are two images, from slightly different positions, or points of view, along the same base of a triangle, blended into one.

To understand this, it is only necessary to hold up your hand a short distance from your face, and closing the left eye, look through the right. You will then perceive that a certain part of what is before you is hidden. If you now, without moving your hand, close the right eye, and look through the left, another, and entirely different, part will be hidden; but remove the hand, and look with both eyes open, you will then see the two positions combined form a single picture.

Stereoscopic photography enables us to obtain this effect; but, whichever kind of instrument is employed for the purpose, it is imperative that two separate negatives be taken with lenses a certain distance apart, and along the same base of a triangle. Cameras are specially manufactured to work this process, and some photographers, with certain alterations, use for this purpose quarter or half-plate cameras. One or two of these I will endeavour to describe, and shall begin with the one I use. This instrument, although primitive, and useless for moving objects or quick work, has the advantage of requiring no transposing of the prints, or dividing the negative for transparencies by contact. The camera, lens and six dark slides for plates, $6\frac{3}{4} \times 3\frac{1}{4}$, pack into a box, $18 \times 7 \times 5\frac{1}{2}$. On the top of this box a grooved piece of wood, $12\frac{1}{2} \times 3 \times \frac{1}{2}$, is fixed on a pivot, and along one side of it small holes half an inch apart are drilled. When required for use, this box is screwed on to the stand and very carefully levelled, using a spirit level for that purpose, and the camera to take a single stereoscopic negative ($3\frac{3}{8} \times 3\frac{1}{4}$) is then made to slide along this piece of grooved wood, till it is in its centre. If the spacing between the lenses is to be three inches, a peg is fixed in the hole one and a half inches from the centre, and the camera moved, till a catch under it comes against the peg, and prevents it going any further. If this movement has been to the *left*, the *right* end of the dark slide is inserted, and the view which has previously been carefully focussed taken. The shutter of the dark slide, being in two pieces, the exposing of half the plate at a time is

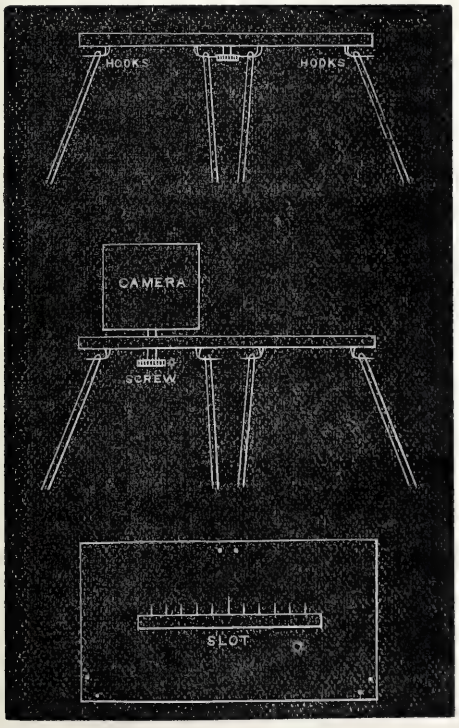
not difficult; then the camera is moved one and a half inches to the *right*, stopped against the peg on that side, and the *left* end of the dark slide inserted and exposed, care being taken that both exposures are the same. Prints from negatives so taken require no transposing, and can be trimmed and mounted without being divided, and transparencies can be printed by contact without any trouble on division of the negative.

Mr. Valentine Blanchard proposes the following method of converting



a quarter-plate for taking stereoscopic pictures: "A very light quarter plate camera was employed, the baseboard of which measured $7\frac{1}{2} \times 5\frac{1}{2}$ It became necessary to get ready a smoothly planed piece of wood, $9\frac{1}{2} \times 8$ On the front, and partly on two sides, pieces of wood half an inch wide were neatly fixed. This furnished, as will be seen by the diagram, a true edge for the front of the camera, and a boundary on each side for its lateral movement, which will be seen to be exactly three inches, for the inside measurement will be $7\frac{1}{2} \times 8\frac{1}{2}$. The wood was not continued entirely along the sides, because the focussing screw came in the way; a hole is placed in the centre for a flat-headed screw to attach it to the tripod head, which is shown by dotted lines, and two other holes are marked to attach the camera by means of the ordinary screw from below. With a little practice the unscrewing of the camera and the rapid movement from right to left, and rescrewing should only be the occupation of a second or two, for the exact limitation of the camera should bring it in each movement exactly over the hole, and make the attachment of the screw a matter of no trouble whatever. To make the identification of the right-eye and left-eye picture an easy matter (for, of course, they are in separate plates), never depart from the order of exposure of the plates. For instance, always employ No. 1 slide for the right-eye picture, and No. 2 for the left, and so on. It would be well also, before development, to mark each plate with its number. The plates must be developed in pairs to have them uniform in density.

An easier way would perhaps be to have a baseboard, 8×6 inches, to

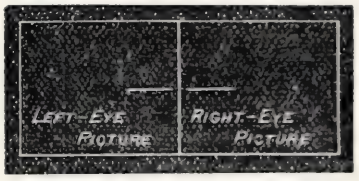


which the stand can be fixed by having hooks for that purpose under the baseboard (see sketch). Along the centre of the board make a slot four or five inches in length, in which the screw which secures the camera can slide. Mark the exact centre of the slot, and place marks at every half-inch to guide the movement of the camera. Now fix your quarter-plate camera on the baseboard, and secure it in the centre; then move it along to the left one and a half inches, and fix it tightly level, and focus the view accurately and take it; then move the camera to the right one and a half inches from the centre, and take the second negative, taking care that the dark slides are numbered and used as suggested in Mr. Blanchard's method.

The most satisfactory method of working this process is, however, with a half-plate camera and a pair of lenses. The camera must, of course, have its interior equally divided, and the two lenses should be of the same focus (about six inches is recommended) and aperture, and the exposure should be simultaneous and equal. In no other way can effective and satisfactory work be done, especially when moving objects have to be photographed.

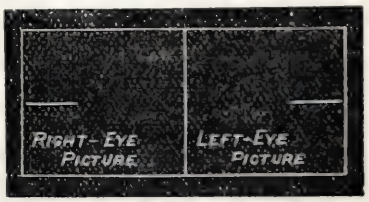
Papers for printing on, and processes for printing and toning, &c., are so numerous and well known, it is unnecessary to describe them. There are also so many brands of plates in the market, all good, that photographers had best keep to those with which they obtain the best results. I myself use Wratten and Wainwright's plates, and have never wished to change them. I have kept these for years in all kinds of climate, and never has a plate failed or disappointed me. The developer I use is Thomas's formula for hydroquinone development.

The trimming and mounting of stereoscopic prints is important. When using a twin lens camera, it must not be forgotten that the lens inverts the pictures, and turns them on their own axis, so that the right hand becomes the left, and the left the right. To enable each eye, therefore, to see its own picture, it becomes necessary to transpose the prints in mounting, or they would be in false relief. In taking a single picture, although the negative is inverted, when the print is made on paper it comes right, but, when two negatives are taken side by side by two separate lenses, each picture is separately inverted, and a print from such a negative, whilst it puts back the right side of the view to the right side of the print, does not change back again the relation of such print to its neighbour, which has been disturbed by the lenses, and nothing but the method of transposition can do this except by again copying in a twin-lens camera. To make mistakes almost impossible in dividing and mounting prints from negative taken with a twin lens camera, Mr. Blanchard recommends a very simple plan, viz., to put a faint pencil mark at the back of the print in the middle of the twin pictures, but on a dark part for fear of showing through when mounted (see diagram).



When the prints are trimmed for mounting, take care that these lines do not touch again, but should come to the edges, as shown in Diagram No. 2. By following this extremely simple rule, the possibility of error in mounting is reduced to a minimum.

If the negatives have been taken with a quarter-plate camera and developed, and assuming that No. 1 slide has been used for the right-eye



picture and No. 2 for the left, and the rest in this order, and the plates properly marked so as to easily identify them during development, the printing is the next thing to be attended to. If it is wished to have both prints on one piece of paper without dividing them, the printing frame for this purpose must be large enough to hold both negatives side by side, and in placing them in the frame it should not be forgotten that they should be reversed or the prints will have to be cut. By reversing, it is meant that No. 1, or the right-eye picture, should be to the left, and No. 2 to the right. In placing the negatives in the printing frame, great care should be taken that the base line of both negatives should agree, otherwise difficulties will arise in trimming and mounting them. If, however, it is not desired to have both prints on one piece of paper, they

can be printed separately, taking care to mark the prints so as to show which should be mounted on the right and which on the left, in accordance with the order of taking the negatives. After printing, lay the two prints side by side, and, with a flat ruler, draw your horizontal line along the foot of both pictures. This must be identical in both, inaccuracy in which will mar the stereoscopic effect entirely. To ensure correctness in drawing this line, note some object common to both where the line will come, such as a projecting stone, a tuft of grass, tree, or some part of a figure, in fact, anything which will be a guide to draw the line and prevent an error. This will have to be done both for prints on a single piece of paper or separate ones. Having your base line, draw another parallel to it and three inches apart, and, their backs being marked, as already suggested, get a cutting shape made of glass three inches by two and five-eighths inches wide, with which the cutting can be complete, and the prints made ready for mounting. The mounted pictures are meant to convey the idea of being seen as if through an aperture; and this effect is produced by allowing the image which is to be viewed by the *right* eye to show rather more of the *left* side of this subject, and *vice versâ*. A simple rule would be, that of the mounted pictures each should show about one-eighth of an inch more than its fellow of that part of the view which comes next to the line which divides the pictures. It will be found easy, after marking your base line and the upper parallel line, to mark the two pictures in accordance with this when using the cutting-out shape.

Books on photography are now so numerous that, after reading up what one sees in both American and English publications, it is impossible to say that anything one writes on a photographic subject is original. When I thought of contributing a short article on "Stereoscopic Photography," I read over several works which alluded to this subject. The result is this compilation—to no part of which do I take credit as being original. H. C. R. Harley.

HOW TO PUT UP A SCREEN.

There is no question connected with this business more frequently asked than "how to put up a screen?' and we think there is none to which we are forced to give such an indefinite answer. No two places in which a screen is to be placed are alike, and therefore directions given for one will not in some way be applicable to another place.

For a small screen, says *The Exhibitor*, that is, one no larger than fifteen feet in diameter, there should be no difficulty attending the placing of it in a suitable position. Two poles, one for each side, are in many cases, in fact in most cases, necessary. Many exhibitors carry these poles with their paraphernalia, and when this is the case they are made in sections of about four feet in length, and fitted together by socket joints. To those who are regularly on the road as travelling exhibitors, this is perhaps the best device, but the objection to their use by the casual exhibitor is their bulk and weight.

These poles should be of a length suitable for the largest screen that is likely to be used, and we would advise that a screen no larger than twenty feet be used on any occasion, unless it be used in some of the largest halls or theatres, and in these cases it is likely that the screen will be found at the theatre or hall as part of their scenery. Even if such a screen is not found, the facilities for fastening a screen upon a drop curtain are quite adequate for any emergency.

The size and location of the screen is always determined by the construction of the room and the position of the chandelier, if there be one.

It is always desirable to place the lantern in the gallery if there is one, and any chandelier between the gallery and the point at which the screen is to be placed, will cause annoyance, unless it is high enough to be out of the way, which is seldom the case. In the event of a chandelier being in the way, it is necessary to place the screen to one side of the room, and as little away from the centre line as possible, and consequently the lantern will have to be placed an equal distance from the centre line, or nearly so. Having determined the position and size of the screen, the next move will be to get screw-eyes placed, one in each side of the room, as high up as possible, through which the ropes that are attached to the top of the screen can be run. The higher up these screw eyes can be placed the better, provided they are not too high in a narrow room, so as to cause the top of the screen to bow, although this would not be likely to occur. If screw eyes cannot be placed in the side walls, then they must be placed in the floor as near to the walls as possible. The ropes are tied to the rope that passes through the top of the screen, and the other ends are carried through the screw eyes, whether they are on the wall or on the floor. If the screw eyes are on the wall, then the screen can be pulled up as high as it will go, and the end tied to other screw eyes that are in the floor, or to some other means for fastening, say a seat or bench, and, if the screen is not then high enough, the two poles come into use. These poles have crotches at the tops similar to the crotch in a clothes prop, and the poles, if in sections, are fastened together to the requisite length, and this crotch is placed on the rope as close to the screen as possible. Before the pole is put up there are tied to it, about one-fourth of its length from the top, two lines, each about twice as long as the pole, and after the pole is raised up in position these two lines are tied off front and back, so as to keep the pole from falling either way. It will be seen then that the pole is held in its place in all four directions: in one by the screen, in the opposite direction by the rope passing through the screw eye, and at right angles by the two ropes that are tied front and back. In this position it cannot fall; there is no necessity to fasten it to the floor, as the weight of the screen will hold it in place. Having secured it in the manner described, the other pole is now taken. It has previously been adjusted to an equal length with the first pole, and it is raised and placed in a corresponding position on the other side of the screen and fastened in the same manner. Before the screen has been raised, small cords are tied at intervals to the sides. There should be eyelets for that purpose. These small cords hang down at the sides, and can be secured and tied off so as to stretch the screen. The top lines that pass through the screw eyes that are fastened to the side walls, or to the floor, are now drawn as tight as possible. This will stretch the screen at the top, and they should be drawn taut on the side that will cause the screen to take a central position in the room.

To one located in the city, who gives casual entertainments, we would advise that he get four strips cut out of inch pine wood, free from knots, and let them be two and half inches wide and about twelve feet long. Let holes be bored into these poles so as to extend over one-half the length of each, and these holes to be about a foot apart—holes that will admit of a half-inch bolt; these bolts should be two and a half inches long in the clear. If these holes are drilled accurately, at equal distances, it will be seen that by sliding these poles up on each other various lengths can be obtained to suit different sizes of screens. No more than two bolts are needed for each pair of poles.

To one who is situated in the city, and has occasional calls in the country, we would recommend that he get such poles made by a neighbouring carpenter; he would not be likely to charge more than fifty to seventy-five cents for them, and this would save the annoyance of transportation, and a cost possibly to this amount.

For a screen fifteen feet square or less, two poles made of large ends of fishing rods will be found very convenient. Dealers in fishing tackle have sockets that fit on to such rods, and such can be selected to make a pole as long as fifteen feet. We do not advise one of greater length than this, as we have found by experience that they will not stand the strain.

CLOUDSCAPES PHOTOGRAPHED AT THE SYDNEY OBSERVATORY.

In forwarding some very beautiful cloud photographs which the editor of *Knowledge* reproduces in the August number of that journal, Mr. H. C. Russell, F.R.S., says: "I am forwarding you a few of our cloud photographs, which, although they belong to well-known classes, are very different from those photographed in Europe. In one or two cases I have been surprised by obtaining a fairly good photograph of the landscape, as well as a well-exposed photograph of the clouds. The cloud photographs are taken here as part of our weather studies, ordinary Marion (not isochromatic) plates being used."

Mr. Ranyard then makes the following interesting remarks on cloud photography: "Somewhat similar photographs of clouds have, during the past few years, been taken by M. A. Angot, in France, and by Padre Denza, at the Vatican Observatory in Rome. A very fine series of reproductions of Padre Denza's photographs have been published in the third volume of the *Specola Vaticana*, showing that a beginning has already been made towards the accurate study of cloud formation and the velocity of wind currents in the upper air. The great layers of stratus cloud seem to present some analogy of structure to the cloud forms seen in the solar photosphere, though the conditions of cloud formation must be very different on the sun and in our upper air.

Our layers of stratus cloud seem to be formed at the junction of layers or strata of air of different temperatures moving with different velocities; they frequently exhibit a regular series of billows extending over a large area of the horizon. It has been found, by laboratory experiments, that, when air is perfectly free from particles of dust, it may become supersaturated with moisture, but, when fine particles are introduced, there is a sudden precipitation of fog. A stream of air may not only differ from the surrounding air in temperature and velocity, but it may differ in the amount of dust which it carries, as well as in its electrical condition. We, however, at present know but little of the conditions affecting the precipitation of water vapour into fog, and of the still more rapid precipitation into rain, which takes place during a cloud burst. Such photographs may enable us to study these conditions as well as the velocity of air currents at different altitudes.

To the eye, the blue sky between masses of cloud looks darker than the cloud patches, but with ordinary photographic plates, which are sensitive to the blue and violet rays, there is frequently very little difference in the actinic quality of the light derived from white clouds and the blue background. Many methods have been suggested to avoid this difficulty, such as the use of coloured-glass screens before the camera, and the use of isochromatic and other plates sensitive at the red end of

the spectrum. Professor Riggenbach has suggested another method of cloud photography, which depends upon the fact that the light from blue sky is generally partially polarised, while that from white clouds is much more feebly polarised. He proposes to use a Nicol's prism or other analyser in front of the lens of the camera, so as to cut down the polarised light and increase the contrast between the brightness of the clouds and their background. One of the objections to this method is that the light of the sky is very differently polarised in different directions, the polarisation depending upon the direction in which the light of the sun falls upon the dust suspended in the air. But it will be seen from Mr. Russell's photographs that, by giving suitable exposures and careful development, very good results can be obtained without using either isochromatic plates or a polarised field.

Some of the most striking results are obtained when large clouds are passing before the sun so that their edges are brilliantly illuminated, and thus the edges of the clouds produce a much stronger impression upon the photographic plate than the background of the sky on which they are seen projected. There seems to be a very distinct and easily recognisable difference between the forms of cumulus cloud seen in the winter and in the summer seasons, and, according to Mr. Russell, there is even a characteristic difference between the clouds which form in Australian and European air. Such little characteristic differences are well worthy of study, not only by artists, but by students of science.

PHOTO-MICROGRAPHY FOR AMATEURS.

[American Amateur Photographer.]

PHOTO-MICROGRAPHY, the art of making enlarged pictures of very minute objects by the combined use of the microscope and the photographic camera, is a most fascinating branch of the photographic art, and one that is specially adapted to the long winter evenings and to the tastes and abilities of numerous amateur photographers who have heretofore been deterred from attempting it because of the supposed necessity for special and costly apparatus. It is true that many special devices are on the market, from the comparatively simple arrangement of camera, baseboard, and lamp, listed by the Scovil, Adams, & Co. at $18·00, to the elaborate, beautiful, and nearly ideal apparatus devised by Mr. Geo. W. Rafter, of Rochester, N.Y., and made by the Bausch & Lomb Optical Co. of that city, at a cost of from $75·00 to $200·00, according to the degree of elaboration with which the ideas are carried out.

While these and other special devices are very convenient for those who can afford them—and, indeed, may be even necessary for some special classes of work—they are by no means necessary for such work as the average amateur is likely to want to do. Any possessor of a fairly good photographic camera, provided with ground glass and plate-holder, and a compound microscope with jointed pillar, permitting the body of the instrument to be turned to the horizontal position, is in possession of all the apparatus necessary to the production of photographic pictures of the objects seen in his microscope, with the aid of only such additional apparatus as can be readily improvised by any one who is really competent to use either the microscope or camera.

My first photo-micrographs were made many years ago, before the dry-plate process came into general use, and were therefore made by the old wet-collodion process and sunlight. The results were satisfactory, but the trouble and bother were much greater than by the present method with the more sensitive gelatine dry plates. My apparatus at that time consisted of an ordinary 5 × 8 view camera, with the lens removed, the camera taken off the tripod and set on a table, with some large flat books under it to raise the centre of the ground glass to a level with the optical axis of the tube of my microscope when horizontal, the eyepiece end of the microscope tube was inserted in the place of the camera lens, and the junction made light-tight by wrapping an old focussing cloth around the microscope tube and carrying the spare end of the cloth back over the camera, as shown in the cut. The light was then allowed to fall on the mirror of the microscope, and directed through the object, when, after proper focussing, a well-defined and highly magnified image was projected on the ground glass, the degree of amplification being determined, of course, by the lenses employed and the distance of the ground glass. For low-power work the diffuse light of day reflected from the plane mirror was sufficient, but for the higher amplification, *i.e*, from five hundred to one thousand diameters, the direct rays of the sun were concentrated on the object by means of the concave mirror. In this way I got some excellent negatives (fig. 2), a portion of a frustrule of Pleurosigma Angulatum, magnified 1000 diameters, being a copy of one of these old negatives. In the original object the markings, which look like fine rows of hexagonal dots, are 60,000 to the inch. The wet-plate process was too laborious, however, for recreation, though it served the purpose of preparing slides for a scientific lantern lecture quite as well as the simpler and easier dry-plate process.

My work in this line has of late been done with a Hawkeye hand camera, the same microscope I formerly used, and lamp light substituted for sunlight. The camera being fitted with a removable rectilinear lens and a drop front containing the shutter, it is easy to open the front, remove the lens, and close up the front again. The camera, with shutter set open, is then placed on a starch box, which happens to be of the right height to bring the centre of the shutter opening on a level with the centre of the eyepiece of the microscope when the body is horizontal. The starch box has four screw eyes set into it, which serve to attach stout strings, which are brought over the camera and drawn taut to hold it firmly to the starch box. The microscope is then turned down horizontal, and the eyepiece brought up close to the shutter opening, and a black shawl, which serves me for a focussing cloth, is wrapped around the microscope body and thrown back over the camera, as shown in fig. 3.

I always use the eyepiece in conjunction with the objective in photo-micrographic work for several reasons:—

1. Because the objectives were made to be used in connexion with an eyepiece, and their corrections are calculated accordingly.

2. Because, in my hands, at least, they give better results than when used without an eyepiece.

3. Because a sufficient amplification can be thus obtained with a much shorter extension of the camera bellows, and, therefore, without getting the milled heads of the fine and coarse adjustments of the microscope out of reach of the operator's hand while his head is under the focussing cloth. This is a very great comfort and convenience, and enables one to dispense with the various devices for focussing that are necessary when the objective is used without the eyepiece and the amplification obtained by a long extension of the camera bellows.

The apparatus having been described, we now come to the method of making the negatives. This may be conveniently discussed under the heads of "Illumination and Lenses, Plates, Exposure and Development."

(1.) *Illumination and Lenses.*—Any good artificial light will answer, providing only that it is steady and uniform.

A well-trimmed kerosene lamp with the edge of the flame set at right angles to the surface of the mirror is good, an argand gas burner very nearly as good, and the Welsbach incandescent gas burner best of all. The ordinary fishtail gas burner is not well suited to this work, as the flame, not being protected by a chimney, is affected by every little draught and is not sufficiently steady.

The light should be about a foot from the mirror, and it is better if a large bull's-eye condenser be placed between the flame and the mirror, so as to render the rays falling on the mirror approximately parallel. There is no difficulty in getting plenty of light to photograph, as the exposure can be indefinitely prolonged, but with high powers, where the light coming from a very small surface of the object is spread over a surface perhaps a million times as great on the ground glass, there is sometimes difficulty in getting light enough for accurate focussing. But for lower and medium amplifications, say up to two hundred diameters (40,000 times superficial), or even higher light, enough for accurate focussing can be obtained by the use of lamp and mirror without the intervention of any sub-stage condenser. In this part of the work, *i.e.*, accurate focussing of the image on the ground glass, a view camera is much more convenient than a hand camera, for the reason that in the former the ground glass is flush with the back of the camera, and a focussing glass can be accurately adjusted so that the ground side is in focus when the focussing glass is in use, while in the hand camera the ground glass is usually some distance within the box, and so out of reach of the focussing glass. With my Hawkeye camera I usually employ a pair of strong convex spectacles, of about six inches focus, in lieu of a focussing glass, and find that, with due care, this answers very well. Here, too, it is an advantage to have a focussing screen of much finer grain than that of the ground glass usually supplied with the camera, but it is not an absolute necessity. In many of the works on photo-micrography directions are given as to the distance the ground glass should be withdrawn from the position in which the best visual image is obtained, the object being to compensate for the difference between the visual and chemical foci of the objective. As I have never made use of any but American-made objectives of high quality, and have always used them in conjunction with appropriate eyepieces, I have not been troubled with this difference of foci, but always make my exposure at the point of best visual image, and with generally satisfactory results.

The new Aplanatic eyepieces made by the Spencer & Smith Optical Company, of Buffalo, New York, are, by reason of their great flatness of field and very perfect spherical and chromatic corrections, well suited to the projection of the image for photographic reproduction, and are the most satisfactory that I have ever used for this purpose.

The best objectives obtainable are none too good for this work, though very satisfactory negatives can be obtained with objectives of very moderate cost, provided they are well made and their corrections for spherical and chromatic error are good throughout their range.

I believe it is best to have the ground glass as nearly as possible the same distance from the eyepiece of the microscope as the eyepiece is from the objective, and to secure increased amplification by the use of stronger objectives and eyepieces, either or both, as the case may be, rather than by increased extension of the camera bellows. I also think it better to secure accurate focussing by the use of the adjustments of the microscope itself than to get an approximate focus in this way, and complete it by moving the ground glass, as is often recommended.

In the selection of the objective and eyepiece to be used to obtain any given amplification, one must be governed by the nature of the object to be photographed. For instance, a one-inch objective of thirty degrees aperture and a half-inch eyepiece will give with ground glass ten inches away from the eyepiece an amplification of about 200 diameters, and will show the general outline and form of Pleurosigma Angulatum admirably, but will fail to resolve the beautiful surface markings; while a half-inch objective of ninety degrees aperture and a one-inch eyepiece will, under the same conditions, give about the same amplification, but will show the surface markings very well. It will, however, have much less depth of focus or penetration, and will show only a single plane of the object clearly, and will therefore be less suitable for photographing reasonably thick objects, such as stained sections of vegetable or animal tissue, than the one-inch objective of narrower angle.

(2.) *Plates.*—Any good brand of plate can be used; but, as all artificial light is richer, comparatively, in red and yellow rays, and poorer in blue rays than sunlight, it is, of course, desirable to use plates that are specially sensitive to the red and yellow rays, *i.e.*, orthochromatic plates. Also, as the light from the mirror comes almost unimpeded through glass and mounting material which surrounds the object in the field, it is very apt to produce halation, and therefore some device to prevent this is desirable, if not absolutely essential. As the light is artificial light, which, even for equal apparent illumination, is much less actinic than sunlight, and the light from a small surface is here spread over a larger one, and consequently weakened, it is desirable to use plates of a high grade of sensibility if we would avoid the necessity of making our exposures inconveniently long. The plates which I have found to answer all these requirements most completely are the new Imperial Non-Halation Plates, of the New Eagle Dry Plate Works, Jersey City, N.J.

(3.) *Exposure.*—This, as in all branches of photography, must vary with the subject and the effect desired, and here, also, with the character of our light source, the angular aperture of the objective, and the degree of amplification. For instance, if our subject is a crystallisation, which, being very transparent, presents but little contrast to the field in which it is seen, we must give a much shorter exposure than would be necessary with the same objective, eyepiece, illumination, and amplification, to bring out the details of structure in stained section of vegetable tissue. On the other hand, with the same conditions as to lenses, amplification, and object, and the same apparent brightness of image on the ground glass, the exposure must be much longer when a kerosene light is used than when the Welsbach Incandescent gas burner is the source of illumination, because the latter furnishes a much larger proportion of actinic rays for a given luminosity, as recognised by the eye. In a general way, one may say that, with a Welsbach light and the ground glass at ten inches from the eyepiece, light focussed on the object by means of a concave mirror, the average exposures are about as follows for Imperial Non-Halation Orthochromatic plates:—

OBJECTIVE.	EYEPIECE.	EXPOSURE.
1 inch of 30	1 inch	5 seconds.
1 ,, ,,	1-2 ,,	10 ,,
1-2 ,, ,,	1-2 ,,	10 to 15 ,,

These times are only approximate at best, and given merely as a starting point for the beginner. In fact, they will vary with each objective and object, and the correct exposure can no more be tabulated in this department than in ordinary photographic work.

(4.) *Development.*—Here, again, the question of the kind of negative wanted will influence the choice of a developer and the method of development. Many will, of course, choose the old stand-by, pyro, on account of their familiarity with it and its reputation for being "controllable" and giving great latitude in exposure. Personally, I do not like it at all, it is liable to stain negatives in prolonged development, and it is certain to stain and roughen the fingers.

Of all the new developers, metol has given me the most satisfaction in this special work, though Carbutt's formula for eikonogen and hydroquinone leaves little, if anything, to be desired, except a better keeping quality in the made up-solution. Amidol, freshly made with sulphite of soda only (no carbonate), gives fine results; but the solution must be fresh, for it deteriorates with a rapidity exceeding any other developer that I have ever tried to keep on hand made up. This would not be a matter of great importance if one were doing such work regularly, but when, as in my own case, the amateur can only snatch an occasional evening at uncertain intervals, a developer that will keep all ready for use is a thing of great convenience, to say the least. The metol developer, in the two-solution form, seems to keep unchanged almost indefinitely in a cool dark room, and to give a very great degree of control over the character of a negative from a given exposure, according to the relative proportions of metol and carbonate solutions used, and the degree of dilution of the developer as a whole. If great density in the high lights is wanted, the addition of a small quantity of hydroquinone to the developer immediately before use will secure it, but in this case more care must be used to avoid staining the plate than when metol is used alone.

In conclusion, I desire to say that the object of this article is to encourage the combined use of the microscope and camera by removing the impression which seems to be quite prevalent that photo-micrography requires costly special apparatus and great scientific and technical skill. Any one who is already possessed of a microscope and camera (with ground glass), and some knowledge of the use of both, will find their combined use a pleasant diversion for the long winter evenings, no more expensive than ordinary photography (less so, indeed, for smaller plates, down to $3\frac{1}{4} \times 4\frac{1}{4}$, can be used to advantage), and one which is likely to lead to a renewed interest in both instruments, and to acquirement and recording of not a little scientific knowledge.

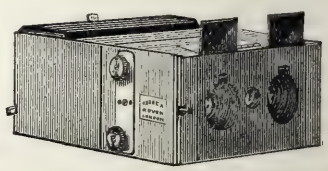
GEORGE E. BLACKHAM, M.D., F.R.M.S.

ROUCH'S STEREOSCOPIC HAND CAMERA.

W. W. Rouch & Co., 180, Strand, W.C.

JUST now, when the use of stereoscopic hand cameras is becoming increasingly popular, special interest attaches to Messrs. Rouch's stereoscopic hand camera, which is sufficiently recommended to notice by the circumstance that it embodies, in a double form, all the many excellencies of construction and usefulness which are to be found in the firm's well-known monocular hand cameras. Rouch's stereoscopic hand camera is made to take plates either $6\frac{3}{4} \times 3\frac{1}{4}$ or $6\frac{1}{2} \times 4\frac{1}{4}$, thus twelve stereoscopic





or twenty-four lantern-size negatives may be made with it. The camera is fitted with a pair of rapid rectilinear lenses, an adjustable shutter, by means of which varying degrees of rapidity are obtained, and it can be used for "time" exposures in the ordinary manner. A circular level is fitted to the instrument in order to ensure the perfect accuracy of adjustment. The plates are carried in Rouch's Patent "Eureka" Changing Back, or, if preferred, a roll-holder or ordinary slides may be fitted. It is needless further to describe this handsome stereoscopic camera in detail; suffice it to say that, like its single congener, it is the perfection of fine workmanship and faultless detail. Stereographs taken in Rouch's stereoscopic hand camera attest that the most pleasing instantaneous binocular effects are readily secured by it.

Lantern Query.

LUX asks: "Would you kindly inform me where I can get further particulars of the Chandos incandescent light referred to in LANTERN RECORD for August?"—In reply: Sorry we have no particulars of the light referred to. Perhaps some of our readers may be able to give the desired information.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [October 5, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

The new constituent of the atmosphere which Lord Rayleigh announced at the British Association is receiving a considerable amount of ridicule abroad. At home it has been suggested that the "new gas" was an allotropic form of nitrogen; but in Germany, says a contemporary, it has been handled more severely, whilst in France it has been scoffed at as "Oxfordgen."

* * * * *

At Mr. Walter Tyler's recent stock-taking the number of lantern slides on hand was found to considerably exceed 100,000!

* * * * *

Dodging up and down the Nelson column, and flashing in the stony eyes of the great sailor, says a contemporary, are nightly to be seen the reflection of the names of all sorts of articles—pills in particular. Then they are flashed upon the National Gallery and upon the surrounding houses. It is all done by means of an electric lantern, and, no doubt, serves as a splendid advertisement. But where will this sort of thing end? Supposing every house in London takes to this flashing system, people will become quite dazed and confused. It seems that the law cannot interfere to stop it. The President of the Society for Checking the Abuses of Public Advertising writes that "the lantern in Trafalgar-square is a beacon-light to warn Englishmen of the results of the absence of regulation in the matter of advertising; for the public may be well assured that, bad as things are, they must persistently grow worse. Everybody who wants in this way, rather than by excellence alone, to gain notoriety for his wares, must outdo the efforts of his rivals; and thus all that has been expended to give dignity and interest to the aspect of London and other large towns will have been in a great measure thrown away."

* * * * *

Some idea of the extent to which the stereoscope and stereoscopic photography are now popular may be gathered from the fact that this year Messrs. S. Guiterman & Co., of Aldermanbury, have sold over 15,000 stereoscopes of various grades, from the cheapest kind up to the elaborate and costly tablescope. Messrs. Guiterman say that they believe the revival is permanent, for with the shorter evenings their sales increase.

* * * * *

The photo-micrographic camera, made to be used with magnesium, as arranged by Mr. W. Forgan, of Edinburgh, and described by "Procella" in a former number of The Lantern Record, is used by Professor Rutherford, Professor Balfour, Dr. Bruce (the pathologist), and many other scientists.

* * * * *

Here is a hint to those likely to visit the popular lantern entertainments given on Mondays, Wednesdays, and Saturdays, at the Royal Photographic Society's Exhibition. A resident tenant has rooms underneath the gallery, and he objects, not unnaturally, to overhead noise. Visitors are therefore requested to refrain from applauding with their feet.

* * * * *

The Lantern Exhibits at the Royal Photographic Society's Exhibition are few but interesting. Messrs. R. Field & Co., of Birmingham, show a pair of lantern objectives fitted with polarisers, and a pair of analysers mounted in a holder forming a binocular, these comprising the essential features of Mr. J. Anderton's system of stereoscopic projection. A medal has been awarded Messrs. Field for the exhibit.

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Mr. Birt Acres exhibits a model of the very ingenious lantern-slide changer to which we have previously referred.

* * * * *

Matthews' portable lantern is shown by Messrs. Holmes & Watson; it has some improvements in the form of body, taps, and jet, which help to make it an exceedingly effective form of open-front lantern.

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The Ideal Lantern No. 1 is exhibited by Messrs. Archer & Sons, of Liverpool. This is a single lantern fitted with a dissolver. Great length of focus is obtainable, and a capital system of ventilation is introduced. High finish, completeness, and practicability are imparted to the working parts of this lantern.

* * * * *

In another column will be found an article by Messrs. A. Haddon and F. B. Grundy, specially written for The Lantern Record, in which are described a number of experiments undertaken with the object of showing the effect of varying percentages of nitrogen on the illuminating power of oxygen when used for the limelight. The article is an important and valuable addition to our knowledge of a subject which has hitherto not engaged the consideration it deserved.

* * * * *

We read that "photographers at San Francisco have been taking some fine night views of the mid-winter fair by electricity. While the building or object is being taken the beam of a strong search light is continually swept to and fro across it, and it thus comes up

gradually on the negative, the darkness being literally washed away by the flood of light. This process can be arrested at any stage, or the beam can be focussed on any special feature, this resulting in some extremely novel and picturesque effects." The photographic information herein intended to be conveyed reads a little strange. We may mention that we have seen several outdoor views of the Chicago Exhibition taken at night-time by the electric light.

* * * * *

Mr. J. A. Sinclair, Hon. Secretary of the Photographic Club, has arranged the following Lantern Nights as part of the Club's programme from October to April inclusive:—October 31, Lantern Night. November 28, Travellers' Night: *Ireland* (with lantern illustrations), Mr. F. W. Hindley. December 5, *Limelight Apparatus*, Mr. R. R. Beard. 19, *The Humour and Pathos of the Street, portrayed by the Hand Camera* (with lantern illustrations), Mr. W. D. Welford. 1895, January 23, *A Talk about Light*, Mr. Birt Acres, F.R. Met. S. 30, Travellers' Night: *Norway*, (with lantern illustrations), Messrs. F. A. Bridge and A. Bridgeman. February 6, Ladies' Night. 27, Travellers' Night: *Denmark*, (with lantern illustrations), Mr. H. Wilmer. March 27, Travellers' Night: *The Far East* (with lantern illustrations), Mr. R. P. Drage. April 24, Travellers' Night: *Snowed up in the Rockies* (with lantern illustrations), Mr. M. L. Troup.

* * * * *

At the Photographic Exhibition of the Royal Aquarium, which is just about to close, the lantern exhibits figured strongly. According to the catalogue, Messrs. Airs & Co. lent the "first biunial lantern" made; we did not, however, succeed in finding it among the exhibits. Mr. J. Dore, of Sandown, had a case of 300 lantern slides, as exhibited at Chicago; these struck us as being very fine. Messrs. J. Theobald & Co. had a large and varied display. At their stand some young ladies were making lantern slides by the transfer process. Mr. Walter Tyler's stand was a particularly good one. It occupied perhaps the most prominent position on the ground floor, and embraced a fine show of lanterns and their paraphernalia. At stand 41 Mr. J. Cheney had an interesting exhibit of his bamboo screen elevators, lantern stands, lantern and slide cabinet, &c.

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The Central Photographic Club has arranged the following Lantern Lights:—October 19, *The Peak of Derbyshire* (with lantern illustrations), Mr. R. Keene. November 2, *Precious Stones* (with lantern illustrations), Mr. T. C. Hepworth. 9, *Windsor Castle in the Jubilee Year* (with lantern illustrations), Mr. W. Brooks. 16, *The Photographic Conventions of* 1892 *and* 1894 (with lantern illustrations), Mrs. Catherine Weed Ward. 23, *The Life Model* (with lantern illustrations), Mr. Gleeson White. 26, Instruction Evening, *Lantern Slides*, Mr. C. H. Oakden. December 17, Instruction Evening, *Elementary Photo-micrography*, Mr. C. H. Oakden.

* * * * *

We recommend the adoption, wherever practicable, at photographic Exhibitions, of the method of displaying lantern slides for examination by the eye now in vogue at the Royal Photographic Society's Exhibition. The slides are placed in a perfectly upright position at the top of an ornamental stand, and at the level of the eye, so that one virtually examines them by transmitted light without the discomfort of having to bend down, as in the case when they are inclined at an angle on low stands, with sheets of white cardboard behind them.

THE NEW INCANDESCENT GAS AND OIL LIGHT.

The application of an incandescing substance for increasing the illuminating power of gas has, as most will be aware, says *Invention*, long been known and appreciated, but we believe its application has always been limited to gas alone. A new discovery has, however, recently been made by Mr. Lasslo Chandor, of St. Petersburg, for the increase of lighting power, not only in gas but also in mineral and vegetable oil lamps, as previously briefly mentioned in our Note Columns. In fact, the inventor claims that his "incandescer," as he has named it, can be successfully applied over almost the whole area of illuminating appliances at present in use.

This incandescer, which is being introduced into this country by the New Incandescent Light Company, of Bucklersbury, consists of a substance made of a specially prepared composition in which asbestos, acetate of magnesia, chalk, and silicate are, we understand, the chief ingredients. While this mass is in a glowing heat, it is moulded into various shapes to suit the ordinary round-wick oil lamps, central-draught lamps, duplex burners, or the Argand and similar gas burners.

On lighting the lamp, this substance is said to become quickly incandescent, and this, added to the increased draught and air-feed resulting from its presence in the burner, is claimed to produce a "complete" combustion, so that the atmosphere is not vitiated, and the escape of unconsumed carbon, which invariably comes from gas flames, being thus almost completely done away with, the blackening of ceilings, walls, and pictures is stated to be reduced to a minimum.

Why the placing of a suitable substance or compound of such description in a gas or oil flame should cause an increase of its luminosity we do not pretend to explain, nor are we acquainted with anybody who satisfactorily does. The fact that it does so, however, in the case of gas, is common knowledge, and now one may have ocular demonstration, on applying to the New Incandescent Light Company, that it is so in the case of oil lamps as well.

The improved combustion obtained by the mere placing of the incandescer in the flame serves, it appears, to fully utilise its illuminating power, just as the use of the familiar metal flame-spreader is beneficial to the light, the incandescer itself also radiating light, and, as we have said, perfecting the combustion of the flame.

Amongst other and perhaps minor advantages claimed for it are that it is no fragile substance or manufacture, like a "mantle," but, to all intents and purposes, is unbreakable, requiring little care, no cleaning, lasting for a very long period, and applicable to existing gas and lamp burners without the slightest structural change whatever.

We are informed that Mr. Tanner, the London County Council expert, has made some extensive and highly successful tests with lamps fitted with these incandescers, a comparison being made in one trial between two 18-line burner lamps exactly alike, one lamp fitted with a stick-shaped incandescer and the other with a metal button. In this instance, it is reported, the first lamp gave an increase in light of between 1 and 2-candle power compared with the other, whilst the consumption of oil was decreased by 30 to 33 per cent. On removing the metal button from the second lamp, a comparison of the two flames showed, we understand, that the one with the incandescer was about 44 per cent. more powerful, while the consumption of oil was less by a still greater percentage than before.

Experiments with other lamps showed proportionate results, and, we gather, the improvement in luminosity, with reduced consumption, is equally marked in the case of gas.

In these days, when the electric light is threatening to drive less efficient methods of illumination out of the market, a means of increasing the lighting power of gas and oil, which is recommended by its cheapness as well as by its simplicity, should be worth the consideration of those commercially interested in gas and oil illumination, as well as of the general public.

THE SEARCH LIGHT.

There is not on the first blush any very intimate connexion between phrenology and the optical lantern, and yet, I am informed, there are throughout the country several peripatetic lecturers on phrenology, who successfully give entertaining and interesting lantern lectures with that science, or pseudo-science, as the subject. I do not exactly know how the entertainments are conducted so as to make the lantern merely a contributory to the dominant interest of the phrenological discourse, but I think I can see that enormous possibilities of fun and amusement are developable in it. There are just two fates one of which I invariably wish an enemy: either that he should write a book, or undergo a public and accurate phrenological examination.

It was Professor Cross, the erudite phrenological *savant*, whose mammoth hoarding posters on which he is depicted applying his digits to the head of Mr. Gladstone, must be familiar to you all, who first mentioned to me the fact of combined lantern and phrenological examinations proving so attractive. He himself is contemplating something of the same sort, and he gave me an inkling of the way in which he proposes to carry out the plan. I vowed by all my gods not to divulge any particulars so that I can do no more than prognosticate crowded houses and a great success as a result of the attempt.

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Of course, you know what I am coming to. I was phrenologically examined by the Professor. One day while the exhibition was on at the Royal Aquarium I had the privilege, in company with a friend, who is, perhaps, the best known man in the lantern world, of having a private *séance* with the Professor. I must say that hitherto I had not entertained any deep respect for phrenology as a science, but, after hearing Professor Cross read off the chief points of my friend's health, character, and intellectuality, I had to confess to a feeling of profound amazement at the accuracy and minuteness displayed in the examination. Then it came to my turn; and, as to that, all I can say is that the Professor, upon whom I had never till that day set eyes, told me what only one other man in creation was qualified to tell me, and that man is myself. His accuracy was simply miraculous. If, as people sometimes say, phrenology is mere empiricism, the results arrived at are even more remarkable than would be the case were it an exact science.

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By the way, I have often thought that a golden harvest lay ready for the gathering by photographers in villages and hamlets, remote from large towns, which are not populous enough to support resident professors of the black art. Particularly in the summer months, no life could be more pleasant than that of a travelling photographer, with his own caravan *au grand complet*. The capital required for such an enterprise need not be large, and properly, assiduously carried out in the way I have indicated, it is one, I do not doubt, which is capable of being made very profitable. Open-air portraiture, groups, and views of the inhabitants' houses would find large numbers of patrons among the villagers, as I can vouch for from my own experiences when on tramp with the camera in the country.

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I do not put forth the idea contained in the previous paragraph as a novelty, for I am aware that it is already being availed of, although only to a limited extent. But it occcurred to me that, especially during the autumn and winter months, the photographer might very well carry with him a good lantern outfit and a variety of slides and lectures, and arrange to give lantern entertainments, at night-time, in the small village halls. This idea is also, I know, being here and there availed of to excellent advantage, and I refer to it now in case any of my readers, who are anxious to strike fresh ground in the way of photographic enterprise, and are not too proud to adopt a nomadic life, may care to avail themselves of a useful, practical hint.

* * * * *

The old-fashioned Lantern Night, so long in vogue among photographic societies during the winter, when heterogeneous collections of slides by different persons were shown on the screen without reference to order or appositeness, seems as if it were doomed to die the death. During the last two or three years I have noticed a strong tendency among lantern-slide makers to lay themselves out to a kind of specialism in their work, which certainly proves more to the taste of audiences than miscellaneous efforts. A man takes an old town or a district, photographs it well, and from his negatives makes a set of slides to which he writes a descriptive lecture. In this way the consecutive attention and interest of his audience is maintained for an hour or more, variety of effect is assured, and the total result is usually gratifying to lecturer and audience alike. The latest innovation in this direction has been started by Mr. J. A. Sinclair, the Hon. Secretary of the Photographic Club. During the winter months he has arranged a series of "Travellers' Lantern Nights." These will consist of lantern lectures, by well-known men, illustrative of visits paid to picturesque places at home and abroad. I have no doubt the Travellers' Nights will be popular with the club and its visitors.

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All the talk just now is of the two Exhibitions recently opened, the Royal and the Salon. Slocum-cum-Podger and the Old Kent-road will soon take up the running, and by-and-by we may look for the local grocer to organize a photographic Exhibition, admission sixpence, "which includes a quarter of a pound of our far-famed counter siftings." After a considerable experience of photographic Exhibitions, I have come to the conclusion that a thick seam of monotony runs through them all. The limitations of photography have such a painfully restricting effect on the subjects treated that it requires very little skill or acquaintance with the matter to foretell what the nature of the pictorial effects aimed at is likely to be. Thus you may be tolerably sure that any Exhibition, no matter where it is, will contain a certain number of *Evenings, Solitudes, Seas and Clouds, Country Lanes, Ecclesiastical Interiors and Exteriors, Portraits* (1) of babies, aged three months to three years, (2) girl babies, aged seven to twenty-one, (3) ladies, ages doubtful, (4) old men's heads. There will also be *River views*, with and without shipping, *Sheep Studies, Waves, Hand-camera shots*, and *Trees and Open landscapes* galore. I should think that, if somebody would organize an Exhibition from which all photographs dealing with the subjects I have enumerated were excluded, an interesting and instructive collection would result. Its chief charm would be that it would not entail the use of a catalogue.

* * * * *

Now that Lantern Nights are again forming part of the autumn and winter programmes of so many photographic societies, I hope that Secretaries and others will bear the Photographers' Benevolent Association in mind, and where opportunity offers seize the occasion to extract a few coppers from the pockets of members and visitors in aid of the good cause. No fund that I am acquainted with is administered so economically and so justly as the Benevolent. The name and address of the Secretary is H. Snowden Ward, 6, Farringdon-avenue, E.C., and from what I know of Mr. Ward I am confident he is only too happy when acknowledging contributions, however small.

* * * * *

By the way, would it not be worth the while of every photographic society up and down the land to have on the table during the meetings a box for the purpose of holding contributions for the fund? Then, when a member made himself obnoxious to his fellows, or indulged in unparliamentary expressions or linguistic exaggeration, it should be the privilege of the Chairman to subject the offender to a fine, which should go in the Benevolent box. Profane words, puns, "shop," and other crimes could be dealt with in a similar manner, to the advantage and profit of the Benevolent, and the cultivation of good manners. Why, I know a certain office, of which the occupants agreed to fine themselves a penny each time an expression exceeding a certain sharply defined limit of forcibility escaped them, the money being placed in a Benevolent box that stands conveniently on the office mantelpiece. In a short time the contents of the box reached an appalling sum. The expense of indulging in Anglo-Saxon became too great, however, and now only "the well of English undefiled" is recognised in that office.

* * * * *

Hampstead Heath last Saturday afternoon was invaded by quite a crowd of "knights of the camera" (this quotation is copyright). It was a glorious day, and, notwithstanding that it was a photographic outing, several cameras were to be seen. Thirty-three members of the Photographic Club and the London and Provincial sat down to a capital tea, "to which ample justice was done" (another quotation). The annual Hampstead Outing forms a pleasant wind-up to the season with a great many well-known men, the more so that, as affording an opportunity for taking photographs, it is looked upon with supreme indifference. Indeed, so strong is tradition on the

point that, although a man may use a camera on these occasions, there is a kind of tacit and general understanding that he need not trouble about getting any results. It is a merciful dispensation, and my only regret is that it does not have a wider application. Photography at large would be the gainer. RADIANT.

THE EFFECT OF IMPURE OXYGEN ON THE ILLUMINATING POWER OF A LIMELIGHT.

ALL who are interested in the limelight and the lantern will most probably remember that on January 12, 1893, we read a paper before the London and Provincial Photographic Association, giving the percentage of nitrogen contained in various samples of commercial oxygen. In the case of one maker the percentage of oxygen varied from 56·2 to 84·5. We promised the members of the above Association, when time would allow, to investigate the influence of the inert and flame-cooling nitrogen on the illuminating power of the light. Up to the present other work has so fully occupied our spare time that we were not able to attack the problem; but, as the lantern season is now coming on, we thought the time a suitable one to fulfil our promise and investigate the matter.

The light-emitting power of any solid immersed in a flame must naturally depend on the nature of the solid and on the temperature of the flame itself, and any inert gas mixed with the heat-producing combustible or the supply of oxygen must necessarily pull down the temperature and the light by not contributing in any way to the rise of temperature, but, on the contrary, by requiring heat, so that it may be raised to the temperature of the flame, and thus producing a cooling effect.

The following table of temperatures will give a rough idea of the light emitted by bodies when heated.

	C.
Just glowing in the dark	525°
Dark red	700°
Cherry red	908°
Bright cherry red	1000°
Orange	1150°
White	1300°
Dazzling white	1500°

It will be seen from the above table that it requires a body to be raised 525° C. before it becomes visible in the dark; but, if the temperature be raised 500° C. beyond this, it becomes bright cherry red, and an increase of another 500° C. makes the body so hot that the light emitted is a dazzling white, beyond which it is impossible for the unaided eye to appreciate any change. According to some experiments conducted by Dr. Draper in America, the light was increased forty fold by raising the temperature from 1070° C. to 1427° C. These figures point most distinctly to the advantages of using a flame at as high a temperature as possible.

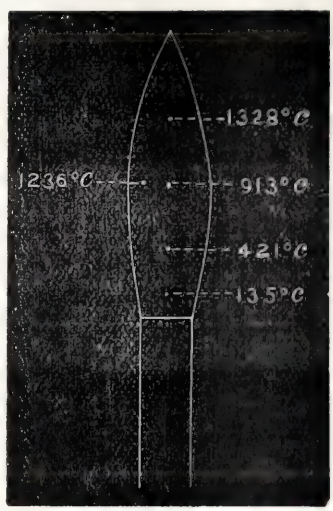
The influence of nitrogen on the illuminating power of ethylene is well shown in the following table given by Dr. Frankland about ten years ago:—

Percentage.		Candles per cubic foot of mixture.
Ethylene.	Nitrogen.	
100	0	13·7
84·7	15·3	10·4
60	40	5·9
36	64	2·4
28·8	71·2	1·4

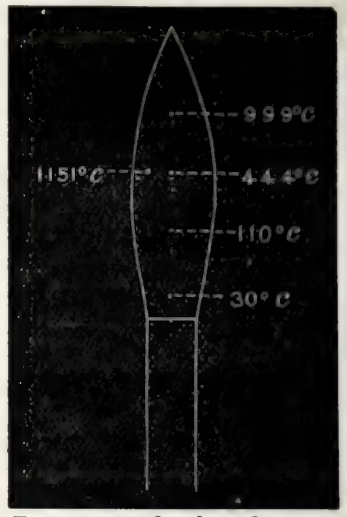
This fall in the illuminating power is due to the cooling of the flame by the nitrogen, and thus preventing the breaking up of the gas into carbon particles, which usually contribute so largely to the light-emitting properties of luminous flames.

The cooling action of nitrogen is very forcibly shown by the two diagrams below, which have been taken from Professor Vivian B. Lewes' work published in the *Journal of the Chemical Society*. The first diagram shows the temperature in various parts of a coal gas flame burning from an open jet; the second that of a coal gas flame with sufficient nitrogen mixed with the gas before combustion so as to render it just non-luminous.

In the experiments we have just made a blow-through jet was



Temperature of luminous coal-gas flame.



Temperature of coal-gas flame rendered non-luminous by nitrogen.

used with rather a small opening in oxygen nipple, and, in order to avoid complicating the matter, the same lime cylinder was retained throughout all the experiments. The purest oxygen obtainable was transferred to a graduated glass bell jar, capacity one cubic foot. The rate of flow of the oxygen was measured by means of a small gas meter placed between the supply and the jet. Near the jet was attached a U-shaped pressure gauge, filled with water, so as to measure the pressure of the oxygen at the nozzle itself. The coal gas used was ordinary London gas, averaging about sixteen candles, and this also was measured by means of a meter. The photometer used was an open Lethebey with the ordinary grease spot and the standard light—one of Mr. Dibdin's ten-candle pentane Argands.

By a preliminary set of observations we found that the quantity of coal gas in no way interfered with the illumination, provided there was a decided excess, which the following table will show. The quantity of coal gas having therefore been determined for one set of experiments, it was not varied afterwards.

Cubic feet of oxygen consumed.	Pressure of oxygen at burner.	Cubic feet of coal gas.	Candle power per c. ft. of oxygen.
2	3·5	2·5	23·5
2	3·5	3·7	32
2	3·5	5·7	32

In order to show that the illuminating power of the limelig varies directly as the area of the lime cylinder heated, and that thi again is dependent on the quantity of oxygen consumed, varying quantities of oxygen were forced through the jet by increasing the pressure at the nozzle, the coal gas being in sufficient excess in each case.

Cubic feet of coal gas.	Pressure of O. in inches of water.	Cubic feet of O.	Candle power pe c. ft. of O.
5·7	1·50	1·4	32·9
5·7	2·25	1·7	33·5
5·7	4·75	2·5	32·0
5·7	5·75	2·8	32·9
5·7	8·00	3·4	33·5

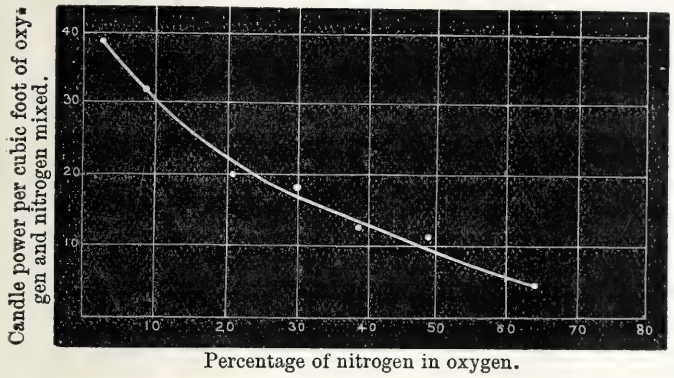
From these figures it will be seen that the candle power of light depends on the number of cubic feet of oxygen consumed.

The purest commercial oxygen we were able to obtain contained 3·5 per cent. of nitrogen, and this oxygen was employed in the following experiments for determining the effect on illuminating power of the dilution of the oxygen with known percentages of nitrogen. This sample of oxygen unfortunately ran out before we were able to complete the whole series of experiments, and the difference between the candle powers already given and those that follow is due to the previous set having been determined with oxygen containing ten per cent. of nitrogen.

Percentage of mixture.		Candle power per cubic foot of mixture.
O.	N.	
96·5	3·5	39
91	9·0	32
79·5	20·5	20
70	30·0	18
61·3	38·7	13
51·5	48·5	11·2
37	63·0	4

Air not measurable.

At the conclusion of this set of experiments, the original oxygen,



96·5 per cent. real oxygen, was again turned on to the lime, and the candle power per cubic foot redetermined. This was found to be the same as before, showing that the lime cylinder had not deteriorated. We have plotted down this series of experiments in the form of a curve, the dots showing the actual experimental numbers obtained. This curve shows in a most striking manner the rapid falling off in the illuminating effect produced by the admixture of nitrogen with the oxygen, and also that the fall in the illuminating power is not directly proportional to the amount of nitrogen introduced, but is greater for the first 20 to 25 per cent. than for the higher percentages.

In each case, after a definite amount of air had been mixed with the oxygen or mixture, a sample was taken and analysed by the method we described last year, so that the numbers given are a correct statement of the actual ratio of O to N.

If any one used oxygen of 56·2 per cent., such as we found to be the case with one sample when we analysed oxygen last year, the candle power per cubic foot would be about one-third or less than that which would have been obtained if oxygen of 96 per cent. had been used; and from what we have already said with regard to the value of the light depending on the quantity of oxygen consumed, if it were possible to force it through the jet, three times as much of the mixture would have to be consumed in order to obtain the same candle power.

The variation in the colour of the light is also a noticeable feature. With the purest oxygen the flame had a slightly bluish tint, which, as the oxygen became more impure, turned greenish, and with the poorest oxygen almost yellow.

We are sorry to say, that of two commercial samples we recently analysed one contained twenty-nine per cent. of nitrogen, so that so-called oxygen has not improved much in quality since last year.

The lime cylinder undoubtedly plays an important part in the light emitted, and we tested five separate limes from the same canister containing a dozen with the following results:—

	Candles per cubic foot.
1	33·8
2	32
3	31·8
4	28·6
5	27·7

This is a considerable difference—amounting to fifteen per cent. between the extremes, with limes from the same box. We are certain that, if five different makes of limes had been taken, there would have been a still greater difference between the best and the worst.

A. Haddon.
F. B. Grundy.

ROYAL PHOTOGRAPHIC SOCIETY'S LANTERN ARRANGEMENTS.

During the course of the Exhibition, there will be displays by means of the optical lantern every Monday, Wednesday, and Saturday evening as follows:—

Saturday, October 6, *Here and there in Italy and Spain*, by Mr. J. W. Holcomb. Monday, 8, *Italian Pictures*, by Mr. H. Little; and *Engadine*, by Mr. R. Tindall. Wednesday, 10, Slides by Lieut.-Col. J. Gale. Saturday, 13, *The Himalayas*, by Dr. Boeck. Monday, 15, Prize Slides, 1895. Wednesday, 17, to be subsequently announced. Saturday, 20, Slides by Members of the Lantern Society. Monday, 22, to be subsequently announced. Wednesday, 24, Slides by Mr. T. Brownrigg. Saturday, 27, Slides by Commander Gladstone. Monday, 29, Slides by Messrs. West & Son. Wednesday, 31, *River Thames, and Foreign Scenery*, by Mr. Hilditch. Saturday, November 3, *Pictures at the Zoological Gardens*, Mr. H. Sandland. Monday, 5, *Western Norway*, by Messrs. F. A. Bridge and A. Bridgman. Wednesday, 7, Slides by Mr. Edgar G. Lee. Saturday, 10, Slides by Members of the Newcastle-on-Tyne and Northern Counties' Photographic Association. Monday, 12, Slides by Members of the Amateur Photographers' Field Club. Wednesday, 14, to be subsequently announced.

LANTERN MEMS.

With the sun setting before six o'clock in the afternoon, and autumnal frosts, one has evidence that winter is approaching and the lantern season has started. The Royal Photographic Society's Annual Exhibition and Lantern Nights are now in full swing, and affiliated and other photographic Societies will be following suit by having the usual Exhibitions by means of the optical lantern.

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The Optical and Photographic Exhibition at the Royal Aquarium is, in a measure, interesting; but, from a lanternist's point of view, anything but representative. The explanation, in my judgment, is not far to seek, for, although the optical lantern may be of use to variety artists, an Exhibition in an establishment that has mainly to depend on variety and sensational shows is not the most likely to be patronised by the trade or visited by earnest lanternists.

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Not that the absent lantern-manufacturers would have been in bad company with such houses as Dallmeyer, Swift, Pillischer, Wray, and others as representative opticians, but the feeling among a certain section is that there have been too many Exhibitions of this class within the last two years to make it worth while to go to the trouble and expense of making a display, and paying for space, at a time of year when so many of the money-spending classes are away holiday-making, or on the moors shooting.

* * * * *

My own idea is that, now the parent Photographic Society has been honoured with the designation of Royal, if they were to acquire or rent a large and central hall in London, and invite *all* opticians and lantern-makers of any note to send in for exhibition

instruments and apparatus invented or designed and constructed during the past five years, a collection of a representative character that would command respect would be brought together, and I think it would pay them to offer the space free of charge on condition that a representative of the firm attended at a definite time of the day or on certain evenings of the week to explain novelties or technical details.

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Another feature of the Exhibition I would suggest to be that for a limited time on Lantern Evenings each exhibitor should have the opportunity of demonstrating practically any new apparatus, such as new jets, new form of dissolvers or slide-carriers, modified lights, &c., and for this purpose the screen and lantern support should be conveniently placed either in the large hall or in an anteroom. The special evening and time for each exhibitor could be announced in the programmes and in the photographic and lantern journals.

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Both the limelight and the electric current should be available, so that accessory apparatus, like the microscope and polariscope, and novelties in projection, such as stereoscopic and chromoscopic, could be shown, or any new kaleidoscopic effects and productions of life-like motions, such as the zoetrope, the praxinoscope, and any development of Muybridge's zoopraxiscope, not forgetting opaque lanterns and aphengescopes.

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Many of these instruments, that have been handicapped for the want of sufficient light, will now be available for general public use in connexion with electric lamps of small size, such as now employed by the Society of Arts, and the Camera Club, in London, and some provincial photographic societies where the electric current is on, for they fit into ordinary-size lanterns without alteration, or with very little modification, which could not be said of the larger and more costly apparatus that are no more efficient for the general run of lantern projections.

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Several novelties in the way of carriers are on the *tapis*, one of which is a holder for the stage to take two framed or thin carriers for unframed slides, and which pass over each other, and, on one being removed, the other is pressed in position by springs. Another is a single carrier, that can be worked panoramically, as in the ordinary push-through carrier, or can be worked as a rolling-up-and-down curtain effect, the slide being changed at moment of obscuration. With two of these a novel and pretty dissolving effect can be produced. The modified form of Eclipse patent carrier for single lanterns is also very good, for it now permits of the fresh slides inserted being in focus when pushed home by the runner, and the slide last shown being withdrawn, out of focus, by one and the same runner.

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Users of compressed gas will be glad to learn that, although they have been subjected to a little trouble and expense due to the modified conditions imposed by the railway and compression companies, such as annealing, increased weight or thickness of cylinder, left-handed threads, &c., they will now be able to effect a saving of about twenty per cent. on the coal gas they have in compressed gas cylinders, the price for small quantities being $2\frac{1}{2}d.$ per foot, for 20 ft. up to 60, $2d.$ per foot, while in large quantities it is only $1\frac{1}{2}d.$ per foot. It is sincerely to be hoped the companies will leave no stone unturned to distribute coal gas of the best quality possible, or purify it themselves to the best of their ability.

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Nothing tends to the discomfort of operators more than impure gas, with the consequent colouring of lime, clogging of nipple of jet, hissing, &c., or makes the use of substitutes for hydrogen (such as sulphuric ether) more likely than this source of annoyance, especially if coal gas has been kept any time.

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Portable lanterns of all kinds are still being designed, and it seems as if the resources of lanternists and makers have by no means been expended yet, for we see announced and exhibited, extension bellows fronted lantern with lazy-tongs connexions between stage and objective mount, also miniature biunial lantern with hinged fronts and central screws for vertical and lateral adjustments, besides every week or so specifications published of new departures in slide-feeding arrangements to stage, and other novelties, making an apparatus when complete that may be counted as novel or improved.

G. R. Baker.

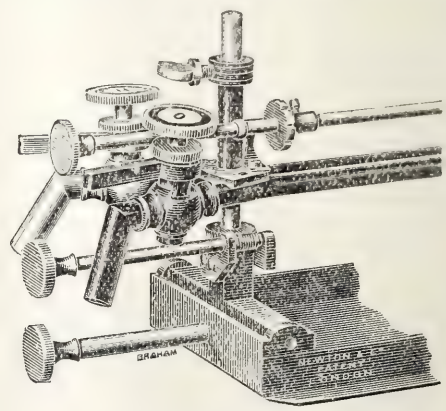
LIMELIGHT JETS AND THE ELECTRIC LIGHT IN THE LANTERN.

[London and Provincial Photographic Association.]

I will confine my remarks to the limelight and electric lamps. The blow-through jets are of various forms; there is a good deal to be said in favour of one or two forms. The one that I prefer is the one with the two nipples, the hydrogen and oxygen gases are kept quite separate as in this jet, you do not get the snap back when dissolving as you do in the more common form where the oxygen nipple is closely covered by the hydrogen tube, for, when the oxygen is cut off by the tap and a small flame left alight at the low pressure, all the hydrogen is not consumed, and there is a suck back into the oxygen nipple, and forms a small quantity of explosive mixture which, when the oxygen is turned on, is driven into the flame, and is very liable to blow out with a sharp snap, and is not pleasant in an exhibition; this jet that I have here is fitted with a cut-off, which I will explain later on.

The mixed jet I have here is about as perfect a jet as, I think, can be made, and has been very carefully worked out by Mr. Lewis Wright, and fully described in his work on optical projection. The mixing chamber is the all-important factor in the manufacture of the jet, as it is absolutely necessary that the two gases should be properly mixed, and not be able to rush through the nipple, but pass through quietly and without friction. This chamber should be conical, top and bottom, and the chamber packed with thin metal discs, separated with rings, one plate with one hole, the next with several. These are laid alternately one over the other. The nipple should be tapered and perfectly smooth, and may be broached out to one-twelfth of an inch. With such a nipple and chamber, a perfectly quiet jet may be made to give a light equal to about 800 candle power.

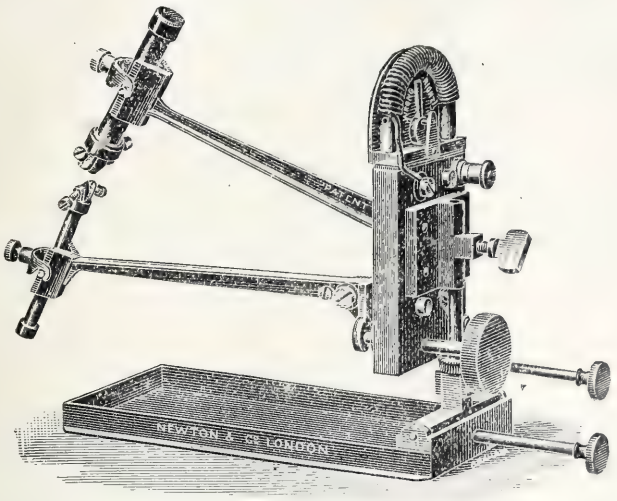
The "cut-off" is an arrangement known as the "Pringle cut-off," and made by Messrs. Newton. The use of this is that the gases may be very carefully adjusted before the jets are wanted for use, and when this is done the tap with the long handle turned over, which shuts off the oxygen completely, and turns down the hydrogen to a blue flame; so, when the operator is ready to start, all he has to



do is to turn on this tap and his light is ready. This is most valuable for photo-micrography, as it ensures always getting exactly the same amount of light, so enabling one to gauge the exposures and save a great deal of time and waste of material.

The fine adjustments on the taps of the jet answer very much the same purpose, but each tap has to be turned separately. It is a very easy way to accurately adjust the flow of the gases; you can by this means get the maximum light without any fear of noise caused by the jerk of the tap. We now come to the adjustments for centering the light. Hitherto good adjusting trays for centering the light in limelight lanterns have been so expensive and looked upon as a luxury that it has been thought well to make a simple form which shall be really efficient and yet very low in price. Attempts have been made to fit motions into the jets themselves; but as the motions can then only be used on the one jet to which they are

attached, this method is not nearly so useful as a tray with adjustments which will carry any jet. The patent adjustments of this tray are very rigid and smooth, and are actuated by two milled heads which raise and lower the jet, and adjust to the right and left.

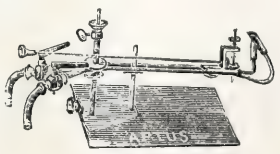


The small arc lamp that I have on the table has been designed by Major Holden, R.E., and made by Messrs. Newton. One great difficulty in the use of the electric arc lamp in the lantern has been the impossibility of obtaining at a reasonable cost a lamp which would give a steady light without constant attention. Hand feed lamps requiring adjustments every two or three minutes were found to be a great inconvenience, while a really good lamp such as the "Brockie Pell," not only was very costly but required a special lantern of a large size for use with. In the "Newtonian" arc lamp, Major Holden has designed a lamp which is self-feeding and focus-keeping, and which yet dispenses with coils, magnets, and all similar complications, and depends entirely on simple mechanical arrangements which can be readily understood and managed by any lanternist.

The lamp works well with a continuous current either from dynamo or accumulators, and is made to clamp on the rod any tray of the ordinary limelight lantern, or on one of the patent adjusting trays as I have here. If desired, an indicator can be fitted to the lamp as in this one, to show whether the electric supply wires have been properly connected; if the index points "wrong," the wires simply require reversing. T. E. Freshwater.

THE APTUS JET.

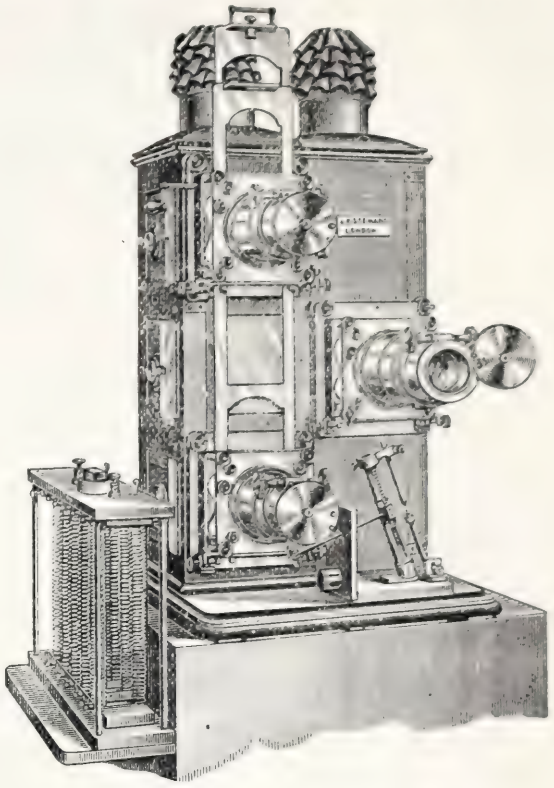
Having experienced the difficulty of centering the ordinary jet in the lantern and retaining that position when found, Messrs. Sharp & Hitchmough, of 101, Dale-street, Liverpool, have devised a simple means of doing so, as illustrated in the cut, and at a small cost. Any of the ordinary jets may have the arrangement adapted to them.



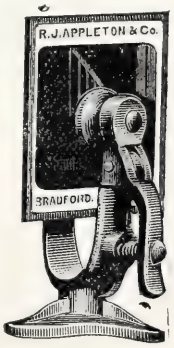
STEWARD'S ELECTRIC TRIPLE LANTERN.

J. H. Steward 406, Strand W.

This lantern is fitted with three Davenport electric lamps, capable of adjustment for height and lateral centering; mahogany body, extra strongly made with strengthening pieces, and lined with Russian iron and Russian iron tops; three brass fronts, capable of adjustment by spring, milled head screws, and locking nuts, for making exact coincidence of all three discs; brass stages, with spring slide plate and clamp screw to hold long or heavy slides in position; one draw telescopic front tube, and rack-and-pinion jacket for focussing, to carry front lenses of 2⅞ (or smaller) diameter. The lenses are of the compound order and mounted complete in pull-out tubes for convenience of manipulation. They are 2⅞ diameter and 7 and 10 inches equivalent focus. The lantern has brass flashing shutters; brass doors for tinter to go between light and condensers, and a long tinter in frame; brass bar handles to lift apparatus by; and triple condensers of 4½ inches diameter, with protecting glass. The curtain shutter is worked by rack and pinion, with



supplemental slide to reveal slide in either stage. The Davenport electric arc lamp is shown in proper proportion on the baseboard of the lantern; it is, besides, suitable for any ordinary lantern.



APPLETON'S LANTERN-SLIDE BINDING CLAMP.

Messrs. Appleton & Co., of Manningham Lane, Bradford, are introducing this slide-binding clamp at the low price of a shilling. These clamps are handy adjuncts in lantern-slide making, that of Messrs. Appleton has a spring catch for holding the slide in position.

MOUNTING LANTERN SLIDES.

[Anthony's Bulletin.]

Without entering into the various modes of producing slides, I would call attention to the manner of mounting them. My attention has been called particularly to this subject through happening to borrow a few to assist an Exhibition. The cover glasses were thick, and in some cases so much so that I could not force them through the ordinary slide-holder, being thus unable to use them. In addition, the binding was of such inferior paper and so poorly attached to the glass, that in some instances the attempt to show the slides stripped the binding over one half its length. Of course I had to repair damages before returning them, but a comparison between them and my own was greatly in favour of the latter. I fail to find that your publishers bring their articles for this purpose strongly enough to the notice of the slide-makers. I have used for years the cover glasses you furnish, which are the very thin, colourless glass, about one-fiftieth of an inch thick, wavy and springy in all directions. When you first suggested their use, I feared for the result, owing to the appearance of the glass, but, upon trying them, have used no others. Their lightness is remarkable, and, in place of the heavy, clumsy slide as before, I have a light one, and, as regards the effect of the curves and waves, they do not show in the lantern at all. I can carry sixty in a box that formerly held only forty, and I believe there is less liability of breakage.

For binding, I use the prepared binding paper Messrs. Anthony supply in long rolls. It is manilla paper, tough, and coated with a heavy

mucilaginous substance that holds on, no matter how you handle them. The title of the picture can be written on the margin, and if more room is necessary for the description it is easy to gum a strip across the end of the slide. I also mark an arrow on one edge, to show how it is to go into the slide-holder. This can be easily seen in the dim light coming from the lantern. I cut the paper into proper lengths, and moisten them with clear water, using a bristle brush for the purpose. As soon as it is thoroughly moist, it will lie perfectly flat on the table and is ready for use. I hear many remarks that one of the drawbacks in preparing lantern slides is the work of mounting and binding; but, as I do it, a large number can be done in a short time, and with very little work. The glass is cleaned by merely breathing on it, and rubbing with a bunch of tissue paper, or, better still, a piece of chamois skin or wash leather. H. S. Nutt.

DR. DALLINGER ON THE GENESIS OF THE LENS AND THE MICROSCOPE.

It was a popular misconception that Archimedes and Ptolemy were acquainted with the properties of lenses; the former left evidence that he knew something of the refraction of light on entering the plane surface of water, but neither had any idea of the influence of curved surfaces upon refraction. The peculiarities of "short sight" were touched upon by Aristotle and a Greek medico named Alexander, but from that time until the Renaissance there was not a single reference in literature to the single lens. Mr. Layard found, in the remains of the palace of Nimrod, a plano-convex piece of crystal, which was supposed to be a lens, but Dr. Dallinger, exhibiting enlarged photographs of this object on the screen, pointed out features about it which must have utterly unfitted it for optical purposes. What its use was has been pretty clearly indicated by later Egyptian "finds" of the same kind; it was clearly a decorative boss used by the Egyptian architects, who utilised quartz, onyx, cornelian, and other richly coloured stones in this way. In 1276, Roger Bacon spoke of a lens as an "instrument useful to old men and others" with weak sight, who might, by this means, see letters sufficiently enlarged to read them. From this period onward, the use of the lens in spectacles became common. One of Raffaelle's portraits, painted about 1515, shows the Pope with a hand lens, used probably for examining some fine missal or other. The passage from lenses of shallow curvature and long focus to those of sharper curvature and shorter focus steadily progressed, but it was not until 1610 that anything approximating to the compound microscope was constructed, and it is almost certain that Galileo was the first to accomplish such a construction. In this sense, therefore, the microscope is at once old and modern. It was a slow process, the evolution of the modern instrument from the point of Galileo to the stage to which it was brought by Lister in 1830. But progress has been rapid within our own generation. Lister's achromatic microscope has been brought, by rapid strides, to the height now touched in the "homogeneous" system, which, in the masterly hands of Abbe, of Jena, has become one of the most valuable aids to research that science could possibly possess. The microscope might be said to have passed into scientific value during the Victorian era.

Correspondence.

THE WELSBACH LIGHT.

To the Editor.

Sir,—Does "Lux," in his query referring to the above, mean the Welsbach incandescent gaslight? If so, I can inform him that I fitted one to my lantern last autumn in place of a three-wick oil lamp, and find it a vast improvement on the oil as regards light, heat, and cleanliness, simply to connect up to ordinary burner, as the lamp, chimney, and mantle are fixtures in lantern. The only drawback is the brittle incandescent mantle wants great care in moving about, but I have had the same one in use all last season, and, if damaged, can be renewed for a small sum, about 2*s.* or 2*s.* 6*d.* I do not find a reflector necessary, and consider the light, which is very white, much superior to oil, but not equal to oxyhydrogen.

If correspondent is in London, should have pleasure in showing him results and manner of fitting.—I am, yours, &c., H. A. King.

52, *Pimlico-road, S.W.*

"UNBREAKABLE" MANTLES.

To the Editor.

Sir,—You will see from the enclosed that the Incandescent Gas Light Company, to whom you referred me in your reply in The British Journal of Photography of September 7, deny all knowledge of an "unbreakable" mantle. Their local agent says there has been one brought out, but that it is a failure. Can you give me any further information, and much oblige,—yours, &c., W. Y. G.

27, *King William-street, Blackburn.*

"Mr. W. Y. Gowans.

"Dear Sir,—We are in receipt of your letter, and, in reply, beg to inform you that we know nothing of the 'unbreakable' mantle to which you refer. It is true that our mantle is improved in its manufacture, but still it is not made of cast iron. For any orders that you may desire, and for other information, we beg to refer you to our local agent, Mr. J. S. Barton, jun. Exchange-buildings, Blackburn,—Yours truly,

"L. de Fonblanque, *pro Secretary,*

"*The Incandescent Gas Light Company, Limited.*

"14, *Palmer-street, Westminster (near St. James's Park Station),*

"*London, S.W., September* 8, 1894."

[In an article on another page, on "The New Incandescent Gas and Oil Light," reference is made to a new incandescer, which may possibly be what our correspondent is thinking of.—Ed.]

Lantern Queries.

Ibi says: "On top of page 622 of Journal is: 'Mr. R. Child Bayley explained Anderton's system of stereoscopic projection.' Will you kindly inform me of what this method consists? I am now trying a method similar to the common stereoscope, so you know if this has been experimented with, and with what results."—Anderton's lantern stereoscope is fully described at page 98 of The Lantern Record for October 6, 1894.

S. M.—No; the device for holding a lantern slide to facilitate binding is not by any means new.

C. P. R.—Yes; the zenotype solution could, doubtless, be used for developing and toning lantern slides. The tones yielded range from light red to very dark brown.

Simplex writes: "Can you tell me where I can get a form of lantern which is wholly manipulated, at some distance away by the lecturer, say when he is standing by the screen?"—We are afraid we cannot help our correspondent. In a back number of the Journal such a system was mentioned as having been described before a provincial society; but our impression was that it was not practicable, or, above all, commercial.

Sat.—We do not think there is an Ives' saturator at present on the market. The one used by Mr. Ives himself is that of Messrs. Perken, Son, & Rayment.

Lime.—Of Newton & Co., Fleet-street.

C. P.—We can give no information as to the relative light-giving power of different jets. Much depends on several other considerations besides the form of jet, as you can easily understand.

Inquirer.—The Lantern Nights are Mondays, Wednesdays, and Saturdays, admission 6*d.* Be at the Gallery at seven, and you will also have a chance of examining the pictures.

G. E. L.—Sheet gelatine, coloured for the purpose, may be had of Cornelissen, Great Queen-street, W.C.

R. Rivers.—Mostly by the wet-collodion process. So far, the larger firms of lantern-slide makers find no advantage, either economically or qualitatively, in gelatine prints.

The optical lantern at the Royal Photographic Society's Lantern Entertainments is, as usual, in the hands of Mr. R. R. Beard.

On Monday last Mr. A. L. Henderson showed a large collection of slides at the Royal Photographic Society's Exhibition, many of them being of snow scenes, the effects of which were much admired.

Mr. Alfred Underhill, of 32, Clarendon-road, West Croydon, has sent us his supplementary list of optical lantern slides for 1894–5. Three series illustrate Antwerp and its Exhibition, and, *apropos* the Tower Bridge, a series of bridges ancient and modern is included.

*** Several communications are unavoidably held over.

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*November* 2, 1894.

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

WE reproduce this month *in extenso* the excellent discourse on Limelight Manipulation, given last August before the Royal Photographic Society by Mr. R. R. Beard. Together with the discussion that followed it, Mr. Beard's lecturette abounds in points of practical interest to users of the limelight.

* * * * *

THE following suggestion as to the formation of lantern-slide societies is given by an American contemporary: "We have postal photographic societies, why not express lantern-slide societies? Every owner of a lantern knows his or her stock of slides by heart, and the family's interest in them is very feeble after the said slides have been through the lantern once or twice. We have print exhibitions and a society lantern-slide interchange. We have postal photographic societies for those who desire to have their work privately criticised, and who wish to critically examine the work of others. To the amateur lanternist a lantern-slide exchange managed on similar lines would be a great boon. Presuming that twelve form such a society, each member might send twelve slides each month (during winter) to the secretary, who would box them and start them on their round, with a book for criticism."

* * * * *

POSTAL societies, photographic and otherwise, are very good institutions on paper, but they seldom work out well in practice. Besides, on the lines above indicated, the item of carriage would form, to individual members, a matter of some seriousness, making the annual outlay a considerable one.

* * * * *

DR. OERTEL, of New York, recommends a paste made as follows:—

Flour	4 ounces.
Water	16 „
Nitric acid	1 drachm.
Boric acid	10 grains.
Oil of cloves	5 minims.

Thoroughly mix the flour, boric acid, and water, add the nitric acid, apply heat, with constant stirring, until the mixture has thickened, and, when nearly cold, add the oil of cloves. This paste will stick anything, and keep indefinitely.

* * * * *

A FEATURE of the new premises which Mr. Walter Tyler is rapidly getting ready for occupation at 94, Waterloo-road will be a room in which a large number of lantern slides will be displayed o upright stands, to be viewed by natural or artificial light.

* * * * *

IT says much for the practical good quality and excellence of the new oxygen, of which Mr. Tyler disposes of some thousands of feet every week, that an old and experienced lanternist should be able to write of it in the following manner: "I may say that the oxygen is the best I have used in the course of twenty-eight years; at any rate, my light has been better the past fortnight than ever before."

* * * * *

EXPERIMENTS were made recently at Devonport to test the adaptability of the electric light to an instantaneous system of naval photography. The electric light was worked from the dynamo on the port flagship *Devastation*, from which a cable was laid to Cremyll, and the rays lit up the Hamoaze and its surroundings with picturesque effect, demonstrating the uses to which electricity can be applied for photographic purposes at sea. More recently the operations extended over a wider area. The current on this occasion was supplied from dynamos on the *Scourge*, moored in Barnpool, to Garden Battery, and, says a contemporary, the illuminant was so penetrating that photographs of two torpedo boats belonging to the *Defiance*, and which had been despatched outside the Breakwater, were easily procured.

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FROM Messrs. Newton & Co., of 3, Fleet-street, we have received their supplementary list of lantern slides for 1894–5. The series includes *Glass and Glass-making; History and Manufacture of Pottery and Porcelain; The Life and Duties of the Citizen; Wasps; 'mongst Mines and Miners; Creatures of Other Days; Corea; Madagascar; English History;* and other attractive and popular subjects subjects likely to be in favour with audiences during the present winter. We congratulate Messrs. Newton on being well up to date.

* * * * *

MESSRS. CROSBY LOCKWOOD & SON, of 7, Stationers' Hall-court, are issuing a small work on *Photo-micrography*, by Dr. Van Heurck, extracted from the same author's well-known and exhaustive treatise on *The Microscope; its Construction and Management*. The work, which is well illustrated, deals concisely and clearly with the principles and practice of photo-micrography, and should be in the hands of every student of that fascinating pursuit.

* * * * *

MR. J. H. STEWARD, of 406, Strand, informs us that he has the electric current on at that address, and will be happy to show the electric arc lantern in operation to any one interested. Mr. Stewart also has Anderton's system of lantern stereoscopic projection fitted to an electric biunial. We strongly advise our readers to take advantage of this offer. Those of them who have not seen the stereoscopic projection pictures have a delightful treat in store.

* * * * *

MR. STEWARD also favours us with his supplemental lantern list, 1894–5. Therein we have particulars of the firm's latest lantern

productions, together with particulars of several series of slides, depicting *Modern Babylon (London), Antwerp and its Exhibition, Switzerland, Japan, Rome, St. Petersburg,* and numerous educational sets. Verily the modern lantern audience is to be envied, for whatever the world at large takes delight or interest in is instantly brought home to them by means of these well-selected series of slides.

* * * * *

Messrs. A. Seaman & Sons, of Chesterfield, send us their List of Stereoscopic Views. Most of the beautiful places of the country have been subjected to binocular treatment by Mr. Seaman, and we can answer for the results being as interesting as they are fascinating. Dealers and photographers should possess this list.

THE SEARCH LIGHT.

I cull the following from *Anthony's Bulletin*:—"'Radiant,' in The British Journal of Photography, comments on a flashlight stereoscopic print that he has seen, and remarks: 'Here, surely, is scope for at-home portraiture, namely, stereoscopic work by means of the magnesium flashlight, by which the most delightful effects could be obtained at comparatively little trouble or expense. This is surely worth taking up, especially by professional workers.' Thousands of stereoscopic prints from flashlight negatives are made every week by Strohmeyer & Wyman, of New York, and the bulk of them are shipped to England by Underwood & Underwood. We venture to think that the English professional workers are aware of this." I fear my esteemed *confrère* across the water rather overrates the extent of the English professional workers' knowledge. The latter may be aware that the innumerable and not generally good stereoscopic slides which are at present flooding the country are of American origin, but my point is that he himself remains indifferent to the ease and advantages of stereoscopic portraiture in his own practice with a view to the revival of business. And it is in the hope of waking him up to those advantages that I so often harp on the subject in these pages.

* * * * *

So great is the interest taken in stereoscopic work among amateurs that, during the last few months, several adaptations of Latimer Clark's plan for taking binocular views with a single-lens camera have been placed on the market. Another device for securing the same effect by means of a slot running across the ordinary triangular head is also finding favour. But not all the suggestions for making one lens do the work of two, that are published, will pass the ordeal of a practical test. Here, for example, is one that was recently given to the world in *Helios*, an admirable little monthly journal published at Brussels; and now figures in the pages of the *Photographic Times*. The description deserves a paragraph all to itself, and shall have it.

* * * * *

"In order to obtain two simultaneous pictures with an ordinary lens, shutter, and camera, we must proceed as follows: A small wooden stage, to which four small mirrors are attached, is fixed by a ring to the hood of the lens, in such a way that it projects longitudinally beyond the lower edge of the hood. The mirrors must be all in one vertical plane. The two central mirrors should meet at an angle of 90° in front of the lens in such a way that a line passing through the centre of the lens bisects this angle. Equidistant from these are placed two other somewhat larger mirrors, with their centres about three and a half inches apart. It is evident that one-half of the lens will now give a picture as though it had been moved one and three-quarter inches to the right, while the other half will produce a picture as though it had been moved one and three-quarter inches to the left."

* * * * *

Is *Helios* aware of the existence of a wonderful lens having hitherto undreamed-of properties, and which it greedily keeps to itself? Fancy, what a useful instrument that would be which, having two dissimilar reflexions placed parallel to its axis, showed itself so supremely indifferent to common or garden lenticular philosophy that one half of the lens gave one picture and the other half another picture! "We shall thus," says *Helios*, "obtain two pictures similar to those which would be taken by two lenses placed at a distance of three and a half inches apart from one another." No, you won't, *Helios!*

* * * * *

I hear it said that the quality of the lantern slides as now shown before the various London societies is not what it was, say, six or seven years ago. Two reasons are generally assigned for the alleged decline, viz., the growth of hand-camera work, and the decline of collodio-bromide. I shall not commit myself to either of these causes as bringing about the effect complained of; but I am under the impression, from my own observations, that the falling off is a real and not imaginary one. Among country societies the average excellence of work, it appears to me, is much higher than in London, where lantern exhibitions generally excite less attention and critical interest than in the provinces, both among photographers and the general public. Possibly this may, to some extent, explain the languid manner in which slide work is followed in the metropolis.

* * * * *

Apropos my remarks on phrenology last month, a friend of mine suggests that a popular and entertaining feature of a photographic journal would be a series of "phrenological" analyses of various well-known personages in the photographic world, without portraits or any personal details revealing the identity of the victims, and with prizes offered for correct guesses. I am no phrenologist myself, but I think I could manage to carry out my friend's notion as intelligibly, if not as successfully, as a full-fledged professor of the science. The only difficulty I can see in the way is that too close an adherence to exactitude and truth in the definitions of the characters of a great many people would make their identities so obvious that every competitor would obtain a prize. This brings me to the reflection that, were phrenology always or even occasionally truthful, it would be far less popular than it is, for the weak or bad points of every man's character generally outnumber the strong and the good. And, as this applies to photographers as well as to other men, it follows that my friend's suggestion, if adopted, would reveal too much of the seamy side of things for public examination.

* * * * *

More than one photographic society has, I hear, lately varied the monotony of its proceedings, by indulging in the dark and savage pastime of blackballing. I hope the secrecy of the ballot was not abused for purely personal ends; but it has always struck me that this system of voting lays itself open to possible objection on that ground. Except for political elections, where the chances of intimidation have to be reckoned with, there is still a great deal to be said in favour of the good old English plan of a show of hands. Gossip used to have it that the house committee of a certain photographic club was formerly wont to be rather rigorous in its rejections, and it would be interesting to know whether the force of example is responsible for the action of the other societies I have referred to, I observe that at the next meeting of the Royal Photographic Society fifty-six candidates are up for election. If one of the number were blackballed—which the fates forbid—it would make the process of voting a long and tedious one, wouldn't it?

* * * * *

On Friday evening, October 26, the Linked Ring gave a smoking *conversazione* in the Dudley Gallery, Piccadilly, W. The Dudley Gallery contained the exhibition of the Photographic Salon, and the Photographic Salon is, I believe, managed by the Linked Ring, the Linked Ring being the General Committee of the Salon, and the General Committee of the Salon being the Linked Ring. Some most pleasing music, singing, and legerdemain had been provided by the Ring for its guests, which, with conversation and the admirable

hospitality provided, enabled all present to spend an evening of much enjoyment.

* * * * *

Mr. Maskell did the honours with unwearied attention to the comfort of the Ring's guests, and among those present I noticed Mr. G. Davison, Rev. F. C. Lambert, Mr. H. E. Davis, Mr. Karl Greger, Mr. J. Kidson Taylor, Mr. W. England, Mr. Fred Hollyer, Mr. Hollyer, jun., Mr. H. P. Robinson, Mr. Drage, Mr. R. Keene, Mr. Ralph Robinson, Mr. Horsley Hinton, Mr. Warnerke, Mr. E. J. Wall, Major Lysaght, Colonel Gale, Mr. Hepworth, Mr. Welford, Mr. Van der Weyde, Mr. Alfieri, Mr. Dallmeyer, Mr. W. L. Colls, and very many others.

* * * * *

The members of the Linked Ring present wore white chrysanthemums in their button-holes, the exact significance of which I failed to discover. There are, I am sure, lots of secrets connected with the Linked Ring which the public would like to possess. Animated, therefore, by the ambition of letting my readers know what these secrets are, I waylaid several of the more communicative members of the Ring, and plied them with artless questions as to the inner constitution of that august body, but I was baffled by the most diplomatic and guarded replies. Then I tackled Mr. H. P. Robinson, and tried all my blandishments in the way of innocent guesswork upon him, but he resisted my applications of "the pump" with smiling imperturbability. Mr. Davison, Mr. Maskell, and Mr. H. E. Davis were equally incorruptible, so finally I gave up the pursuit—and myself to the enjoyment of the programme, which seemed the most profitable thing left open to me. Radiant.

LANTERN MEMS.

With photographs taken at the rate of 43 per second, and continued for 30 seconds before the record ceases, a result has been achieved and made available for reproduction of such a marvellous character that without it is witnessed it cannot be properly realised. By simple multiplication it will be seen that over 1200 exposures are made in half a minute, and these on a sensitive film of celluloid 45 feet long, which, after development and printing, are arranged in an instrument capable of being rotated at such a rapid rate that visual continuity of movement is the result.

* * * * *

Such an achievement is that of Edison's, and such an instrument is the "Kinetoscope" now being exhibited at 70, Oxford-street, and, to judge by the amount of patronage already obtained, there is no doubt the invention has "caught on" in this country, and all interested in optics, photography, and science generally, should take an early opportunity of inspecting the wonderful show.

* * * * *

A kinetoscope is of cabinet form, about four feet high, and on the top is a lenticular eyepiece through which the observer looks into the instrument. An electro-motor inside actuates the mechanism, and a small incandescent lamp illuminates the subject, of which I understand there are at present about forty produced. Those on show number ten, for there are two sets of five machines, and either or both sets can be viewed, according to the price paid on admission.

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Those who saw Anschutz's wonderful effects of animals and birds in motion, and compare it with their new instruments, will admit the distinct advance made by Edison's kinetoscope, for in the case of a dancer, athlete, or contortionist, there is the muscular and physical alteration going on in the miniature individual before your eyes, while, in compound subjects, such as cock fighting, cats boxing, &c., with the man in charge of the birds or animals, each successive movement and action of the performers *is natural.*

* * * * *

The effect on one's mind on seeing the reproduction of a *Barber's Shop*, and all the life and action of the four or five persons portrayed, or the *Drinking Bar* and the fight following an insult and final expulsion of the combatants, is at once surprising, wonderful and charming, and when its course is run out, and the light is obscured, one would like to say, as a child would in its glee at something that pleased, "More" or "Again;" but, with people following close behind, anxious to see the next subject, one cannot be gratified with an *encore*, as one could demand by acclamation if it was an illustration on a large scale that all could see.

* * * * *

This brings me to the reason that caused me to visit this Exhibition, viz., the possibilities of projection, and I am indebted to the courtesy of Mr. Robert Twayze, the electrician and manager, for the information in connexion with this instrument and the announcement that at some future time, not very remote, the arrangements will be completed for producing the effects on the screen by means of a stereopticon, as they call it in America, or pair of optical lanterns, as we understand it in England, for, although in the visual instrument the photograph is about one inch in size on the film, there is no difficulty in the way of enlarging up to the necessary amount for projection, and, in fact, given suitable surroundings in strong daylight, a series of 1200 photographs can be taken of a stage group or other incident, and reproduced at any time afterwards. A detail of interest in connexion with the kinetoscopes now exhibiting in London is that each subject costs 2*l.* 4*s.*, which, divided up, would be less than one halfpenny each photograph.

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As electricity must be employed, the kinetoscope is not at present a form of instrument that can be counted on for parlour amusement, but for places of entertainment or *soirées* at halls it will be as attractive as the phonograph was when first introduced.

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The conveyance of compressed gas has at last been put on a definite footing, and the railway companies have issued instructions to their agents, and published conditions on a consignment note, that must be signed by the sender of gas cylinders, and accompany each one sent, either by goods train or passenger. It is to the effect that the sender "hereby agrees and hereby certifies that the consignment complies with the conditions that the cylinder or cylinders must be of wrought iron or mild steel of the best quality, containing not more than 0·2 per cent. (? 0·25) of carbon, thoroughly annealed after manufacture, of sufficient strength, and efficiently tested." Also the cylinder to be *encased* in either, (*a*) closely plaited hemp; (*b*) fixed in ordinary wooden box without lid, but with rope handle; (*c*) loose in ordinary box, with lid secured by strap; (*d*) efficiently protected by closely woven wicker work, the valve of cylinder not to project beyond the wicker work.

* * * * *

That these safeguards are desirable, all interested in the extension of the use of cylinders and compressed gas will agree, for it is by making the use as safe as possible that all anxiety as to results ceases to exist, and, if, as was maintained by many, there was a great risk in sending cylinders by rail and carrier unprotected, the sooner it was made compulsory to encase them in suitable boxes or covers the better.

* * * * *

There was no doubt also that a limit of weight and thickness for each size cylinder should be decided on, for, at the Lantern Society the other evening, a cylinder that had been condemned as too light for safe use was, if I remember rightly, on being cut through, found to be about one-third the thickness that experts say should be the substance to safely stand the wear and tear of use and pressure to which the gas is pumped in. It is, of course, difficult to adopt a rule and standard of weight and thickness without now and then some instances occurring where cylinders, probably perfectly sound and safe, come just below the weight, and have to be condemned; but, nevertheless, it is hard on the owners, although the compression companies and agents do their best to reduce the loss by making a liberal reduction on the price of new ones to replace the old, and to in all ways agree with the alteration of conditions.

The railway companies will not take any liability or risk whatever in conveying cylinders, and it is most important that senders of cylinders fill up the consignment note in each case, as otherwise they may be liable to a penalty. I would advise all users of compressed gas to write to the railway companies that convey their cylinders for a supply of the consignment notes for the carriage of compressed gases.

* * * * *

Several new kinds of cases for lantern transparencies have been introduced lately, one being a plan that permits of a large number of photographs to be carried in partitions, one on top of the other (face to face), with a separate partition empty for the reception of those shown. The front of the case is cut away in each section, so that the fingers can reach each plate in succession, and a loose top or cover passes over the whole and secures it. Another kind contains a number of slides on their edges, in partitions taking eighteen or twenty, and indiarubber ribs top and bottom prevent any jar in travelling, while the loose top is held by brass loops at each end, and then all secured by a strap which forms a handle. G. R. Baker.

LIMELIGHT MANIPULATION.

[Royal Photographic Society.]

I had intended to bring up some apparatus to show you the different forms that the limelight jet had taken at different periods, but during the last three weeks I have been rather seriously ill, and I could not devote to the subject that amount of attention which I should have wished. What I propose describing to-night are the various jets for the production of the limelight in use from about ten years ago to the present time. I think that these recent forms are what we want to study; and I take it that, from the uncertainty that we have at the present moment of the quantity of candle power given by a limelight, it would be as well perhaps to take the subject in hand, so that we may have some fixed data to work upon, and in order that, when a jet is produced, we can tell its efficiency without saying it is 800 or 500 candle power, because I do not think there is at present anything to tell us whether it is one or the other.

In the first place, you are all familiar with the origin of the limelight, which I believe was brought very prominently forward by Lieutenant Drummond. He used the ordinary separate or safety jet, or something similar to that, and a small ball of lime which was made incandescent by the oxyhydrogen flame, and that produced the limelight. The ordinary safety jet that we come across, say, ten years ago, was formed from

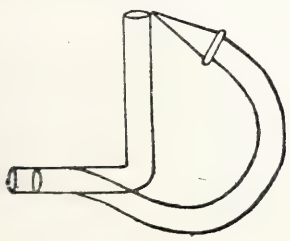


Fig. 1.

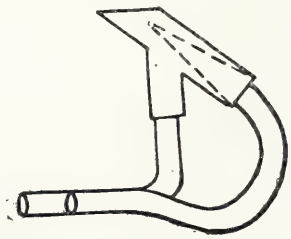


Fig. 2.

the nozzle of a tube of this description (fig. 1). In this case you have a perfect safety jet which gives very good results indeed; in fact, I remember seeing Mr. York obtain a beautiful illuminated screen of 18 ft. diameter with a jet of this description. However, at the present day, we seem to have gone in for something of this sort (fig. 2). In using that jet, if you shut off the oxygen, the hydrogen not being consumed in the centre of the flame becomes mixed with the oxygen in the other tube, and im-

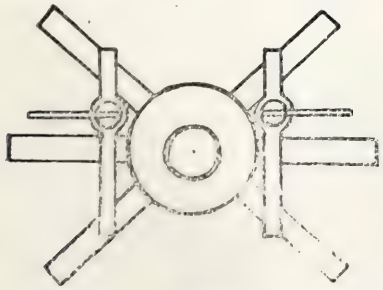


Fig. 3.

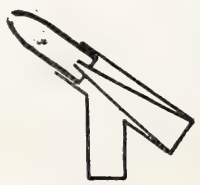


Fig. 4.

mediately you turn on the oxygen to get the light the whole of this gas in the tube explodes or goes off with a pop, and with a biunial this is most awkward to a person not acquainted with the fact. The dissolvers at the back of the lantern are usually fitted with bypass taps (see fig. 3). In using a pair of safety jets you must turn both of these taps on a little; when you turn one lantern down, you have to leave a little bypass of hydrogen to keep the jet alight; if you shut off the oxygen bypass entirely, you will get the mixture in the oxygen tube. What you have to do is to turn on the oxygen bypass tap, and if you see a little blue bead form you know that you have oxygen passing along. This jet has been further improved by fitting a little movable nozzle of this description (fig. 4). This allows the hydrogen to go through, and the oxygen some distance down. In this jet you get a very good mixed gas flame which will give you a very fair result, a little better than the separate jet but not so good as the mixed jet, and at the same time you get rid of all that surplus heat that you have in the separate or blow-through jet from the great flame which goes on either side of the lime.

The next is the mixed jet. Going back, perhaps, further than ten years, we find the whole of the mixed jets were made with a central tube for the oxygen, and then a disc fitted with holes bored through a mass of metal, and this was boxed up in a case so that the hydrogen would go

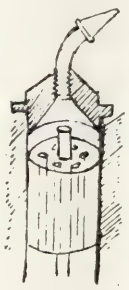


Fig. 5.

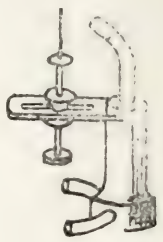


Fig. 6.

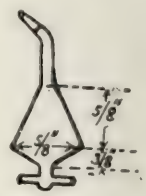


Fig. 7.

through the holes and the oxygen through the central tube (fig. 5). So in this case you had the whole of the gases rushing up in that way; that is to say, they did not come in contact with each other, but ran along in parallel waves, and if you get one of these jets, and compare it with a modern jet, you find you will not get so good a result, in fact, nowhere near so good as with the jet I am going to describe in a moment. The other jets on the mixed system were those more frequently used in theatres, and they were made in this manner (fig. 6). With a jet of that description even at the present day you get sometimes the best results, results which will compare favourably with jets fitted with the utmost care. The tube, perhaps, from the base to the mixing chamber will measure about 3 in. or 3½ in.; the hole would be $\frac{3}{8}$ in., the nipple would be about $\frac{1}{20}$ in., and I think a jet of that description compares very favourably with the best jet you can make. Only a few weeks ago I had some of them to repair, and I tested them as carefully as possible, with very satisfactory results.

For the ordinary lantern jet I must take you back to a plan proposed by the Rev. Mr. Hardwich, and which at the present day is as good as any I know. The formation of the internal chamber is shown in fig. 7. The hole where the gases came in contact was $\frac{1}{4}$ in., the other dimensions as indicated in the figure making an inch for the length of the whole of the chamber. The vent tube was $\frac{3}{16}$ in. bore; the nipple was slightly tapered, $\frac{1}{20}$ in. in diameter. At the time of the controversy with Mr. Scott as to his $\frac{1}{14}$ in. saturator, Mr. Hardwich wrote me and told me that he got equal results with the jet which he had made with $\frac{1}{20}$ in. nipple, and with an ether saturator. A jet similar to this was used at the first Crystal Palace Exhibition for the large screen. There was some difficulty in getting the nipples in the small tube to burn quietly, but the difficulty was surmounted by the adoption of the old plan of using a box chamber made with a base the same as Mr. Hardwich's, but with a measurement of about $\frac{5}{8}$ in. and perforated discs, the first punched in the centre, and the next perforated round the edge, a thin ring being placed between the discs. In making a chamber of this description, the more irregularly the holes are punched—I was going to say the more roughly—the better seems to be the result. You can give the workman the tools and gauges and tell him to put that jet together, and you know it will give a quiet flame directly; there is no necessity to test a jet of this kind, you can be quite sure the instrument will be satisfactory.

The next thing is this: although you have got the jet to give the best results, have you got the best material to work upon? The limes I have brought this evening are the best I can find for the work. Here are a few specimens which have been in use, and one similar to those used at the Crystal Palace. [The sample limes were passed round for inspection.] Here is an ordinary common lime known as a "hard lime," which is no use at all when used with the best mixed jets; it would be perforated and burnt up in a twinkling. The Nottingham lime is the only lime which I can get to stand the mixed jet of high power.

I have been talking of jets used with oxyhydrogen gases, but with gas used with saturators they really want a little difference in their construction; that is to say, a jet used with the saturator should, in my opinion, be packed to make it entirely safe against an explosive mixture occurring in the saturator. It was only a few weeks ago that I was using one of Perken, Son, and Rayment's with the ordinary jet that I

described just now; I suppose I must have run it dry, or something, but, in dissolving from one lantern to another, a terrific explosion occurred which blew the whole of the tubes away, and bulged the ether tank, which, of course, is one proof that something ought to have been there to stop the flame from running into the tank. The jet that the Rev. Mr.



Fig. 8.



Fig. 9.



Fig. 10.

Hardwich designed would have accomplished that. It was a jet of the same description that I have been explaining at the base (fig. 8).

The chamber contained four pieces of gauze held in position by a little spring ring; the inside was packed with powdered pumice sifted upon gauzes, one of 60 mesh and another of 40 mesh, that supported on the 60 mesh being packed into the chamber. That entirely prevents any flame from passing back, no matter what explosive mixture you have; I have tried in many ways to get a flame back, but have been unsuccessful.

In using a jet of this description with the oxyhydrogen gases, you cannot get the whiteness of the lime that you can when using a straight way with simply interspersed diaphragms. I do not know why it is that the pumice causes the heat to be less, or the lime to be yellow, but it is a fact that it does so.

I have explained to you the separate jet and the mixed jet; now there are in the market jets called interchangeable jets, which are invariably made with the bottom portion of the chamber drilled in this way (fig. 9). This does not supply what is wanted—a quiet jet with the greatest brilliance; but Messrs. Otway have, I believe, lately made a jet with a chamber packed as I have described, and the form of which will be seen from fig. 10. The jet is fitted with two separate nozzles, and can be used as desired.

The gas question has been another serious obstacle to getting the best results. You will notice that some of the limes which I exhibit have something of different colours deposited on them; that is from the coal-gas compressed in the cylinders, some cylinders depositing more or less of this black substance on the lime, which greatly deteriorates the incandescence of it. To obviate that, I have tried saturators of the ordinary wash-bottle form filled will benzoline; I find that that prevents it to a considerable extent, and also saves the gas; that is to say, in an entertainment, instead of using 4 feet of hydrogen, you would perhaps use 1½ feet, the other would be the vapour of the benzoline, and you would only get about one-third of the deposit which you would get if you used the whole of the gas in the cylinder. Again, oxygen has been put upon the market, which, as you know, has been very impure, and this all makes matters worse for the practical user; he goes out with a cylinder of known capacity, and sufficient to give him the best results for a two hours' entertainment, but after a short time he finds his results are bad owing to the impurity of the oxygen.

I should like to add a word as to the measurement of the intensity of limelight. The only method I know is to compare it with any other oxyhydrogen flame from a jet. I have known jets apparently alike in their results, but one was said to be 500 candle power, and the other 800—which was right? I am sure I don't know. I think it is very desirable that there should be some definite method of testing, so that we might say positively, "This is of so-and-so candle power."

R. R. Beard.

Discussion.

The Chairman asked Mr. Beard to give some idea of an arrangement for testing jets.

Mr. Beard said he would rather leave it to some one else to suggest a method.

The Chairman remarked that Mr. Beard's paper had been read at an opportune period of the year, as the winter, which was approaching, would be for many present the time of limelight. Mr. Beard was as thoroughly practical with regard to this subject as any one in England, and consequently anything from him came with authority, and was certain to be of utility. There was no doubt that a good many of Mr. Beard's remarks would give rise to discussion, which would now be in order.

Mr. E. Clifton said he would like to raise the question of the absolute safety of the pumice chamber. Mr. Beard had spoken up more strongly for it than he had ever heard any one else venture to. His statement was, that he had tried in vain to produce a flame by back-lighting.

Mr. T. Bolas referred to the Hemmings safety burner, which was packed with metal wires, and remarked that he would be very much surprised if the pumice stone arrangement could be used under the same circumstances as the Hemmings jet was used, the gases being mixed in a bag, and if the mixture were properly made, the result being an absolutely solid and very small but intense flame. Forty years ago the Hemmings jet was very commonly used for lantern purposes. Mr. Bolas had one in use at the present time for laboratory purposes. The Hemmings jet consisted of a cylinder of brass about ⅜ of an inch internal diameter and from four to five inches long; it was packed quite closely with fine wires, about No. 30 or 32, and great care was exercised in making the jet to get the wires quite straight and parallel. After the wires were inserted a core was driven in to tighten them, and the result was a jet as near safety as possible. It was an ideal limelight arrangement, but Mr. Bolas had not seen it made lately.

The Chairman asked what sort of light it gave.

Mr. Bolas replied that he had never used it in the lantern. It gave a small flame, and the smallness of the flame was a measure of its efficiency. If the mixture was properly made the flame was absolutely solid, there was no hollow core at all.

Mr. W. E. Debenham inquired whether it was difficult to get limes to stand it.

Mr. Bolas thought it would break up the limes more quickly than a less efficient flame, but, as he never used it for a long operation on the lime, he could not say. It would be seen, on reference to old lantern catalogues, that the lanterns were described as fitted with the Hemmings jet.

Mr. Debenham suggested that, as limes had been improved since the time mentioned by Mr. Bolas the jet might be more efficient now than formerly.

Mr. Bolas thought that it was the best jet going.

Mr. Beard said Mr. Hardwich got a flame through a Hemmings jet very easily. He had experimented largely with jets of that description, and had packed one with cane, six inches long, but the flame came through.

Mr. Bolas said that was to be expected, but he did not think a flame had been got through a properly packed Hemmings jet.

Mr. H. A. Lawrance had assisted at photometric experiments at the School of Mines, when carbon disulphide was used with a specially made Hemmings jet packed with very fine wire, and an explosion took place.

Mr. Beard said that with carbon disulphide he had got an explosion through the pumice in one chamber, but it had not gone through the second chamber.

Mr. Bolas said several accidents had occurred from the gas escaping at the rubber connexion.

Mr. T. E. Freshwater said Mr. Beard had thoroughly grasped the whole matter. He had seen as much as three-quarters of an inch of wire packing fused when the gases fired back, but that was when the gases were mixed. It was very unsafe to carry about mixed gases, because it was almost impossible to know when one had the exact amount which would not explode. For the mixed jet, he thought the best possible mixing chamber was a series of plates with one hole and five holes alternately, separated by a small ring of wire, and it was very necessary that the internal tube of the nipple should be very smooth and well polished, so that there was no resistance. His firm were making experiments in the matter of nipples, and at a future time he hoped to be able to show some which would give considerably more light, though, of course, a good deal more of the two gases would be burned. With regard to the discolouration of the lime, he had lately tested some limes with a bottle of hydrogen, and in the course of a few minutes they were covered with a dark oxide; whether this was due to impure hydrogen, or to the hydrogen having been kept in the cylinder for a considerable time, he had been unable to ascertain. Sometimes the lime, directly the hydrogen was turned on, became almost blood-coloured, and about fifty per cent. of the light was lost; in fact, he had known cases where the hydrogen was so bad that he could get scarcely any light in the lantern. There was some considerable difficulty in ascertaining the cause of this.

Mr. Bolas pointed out that if a clean iron pipe was used in laying on gas to a house, until the pipe got greasy and dirty, the coal gas would carry with it a considerable quantity of the iron, and an iron stain would be produced on the ceiling when the gas was burned. Iron carbonyl was always formed when clean iron and coal gas were in contact, coal gas always containing carbon monoxide.

Mr. G. Davenport did not think the discolouration of the limes was caused when gas was kept in bags. Professor Lewes had stated that, with regard to the effect of the compression of gas, there was no doubt some of the impurities were compressed in a tarry form and deposited in the cylinder.

The Chairman said that, with regard to the two limes shown by Mr. Beard, there were two distinct deteriorations, one pink and the other black, and he suggested that they were two separate deteriorations of the coal gas kept in cylinders. He fancied the cause of which Mr. Bolas had spoken produced the pink colour, and that the impurities left in ordinary coal gas were responsible for the blackening. He had himself found sometimes one and sometimes the other of these deteriorations when using the same cylinder: if he kept coal gas long in a cylinder he always got one or the other, and this was so invariably the case that, if he meant to lecture, he would not keep coal gas long in any cylinder at all.

Mr. Bolas thought one of Mr. Beard's limes was certainly discoloured with iron.

Mr. Beard had kept hydrogen in a cylinder for two years, and no blackening of the lime occurred; but with another cylinder which had been burnt out to prevent discolouration an increased deposit appeared on the lime. The red colour was usually formed with a bypass flame only, and the black in the oxyhydrogen flame.

The Chairman said that rather indicated a greater or less mixture of air with the gas, he thought. He had experienced both kinds of discolouration, and never knew which to expect, but as a rule, if he kept coal gas long in a cylinder, he got one or the other, and sometimes both.

Mr. Clifton referred to another trouble, the blocking up of the nipple. He had found that if he kept coal gas lying by in a bottle the nipple wanted cleaning out, after showing three or four slides, to get the light clear again, and that was simply due to the gas having been kept.

The Chairman said Dr. Mercer, of America, was present, and would recount his experience of the limelight.

Dr. Mercer said he had not had much experience with limelight, but had had occasion to make an investigation with regard to its use, and had decided not to use it on account of its excessive cost. He believed he was correct in saying that for a lecture of average duration the cost of the limelight would be about 12*s*., and, as electric light could in America be obtained at much less expense, he thought he should have very little to do with limelight.

Mr. Freshwater asked whether Dr. Mercer made his own gas, as he did not see how it should cost so much.

Dr. Mercer replied that the gas was prepared in his own city, and put into large tanks and sent all over the country for theatrical purposes, and he could obtain it first hand without shipment.

Mr. Clifton asked the price per cubic foot, but

Dr. Mercer did not remember.

The Chairman said that on the previous Sunday Dr. Mercer was with him, and he used a saturator giving a pretty fair light for photo-micrography; he worked for four or five hours and did not consume quite ten atmospheres of gas from a forty-feet cylinder, so that the cost was not very serious.

Mr. Lawrance, referring to the comparison of limelights to which Mr. Beard had adverted, asked whether an ordinary Bunsen's photometer would not answer the purpose?

The Chairman did not know why it should not.

Mr. Clifton thought Mr. Beard referred to testing for candle power rather than comparing one limelight against another.

Mr. Beard said as soon as the best result was obtained on a particular spot of lime it began to deteriorate at once, and it was necessary to move on to another surface.

The Chairman thought the lime could be turned and the adjustment made as quickly as possible; he did not see any difficulty about it. He was not aware that any wholly impartial person had yet made a statement as to the candle power of a jet.

Mr. Clifton thought there was in The British Journal Almanac for 1874 an article by Mr. Pumphrey, of Birmingham, dealing with a method of testing the candle power of limelight.

The Chairman said nothing could be simpler than a Bunsen. Mr. Beard's paper was an extremely useful one, and so far as he could make out—and he had had a considerable amount of experience with the limelight—the maximum incandescence had been obtained that was possible with lime. He had a strong opinion that, if any marked improvement was to be made in what was called the limelight, they must turn to some other substance; possibly a better light would be given by the oxy-hydrogen blow-pipe acting upon some more illuminating substance than lime. There were other substances which from a certain point of view would give a better light, but they had their own inconveniences—destructibility among other things. A substance was wanted which would burn for a given time—at least an hour—and it must not be destructible. He had tried zircon and magnesia in various shapes and mixtures, and always found that, if he gained anything in the matter of light, it was lost in the matter of inconvenience which rendered those substances practically unusable. Again, with regard to this particular point, it was necessary to draw a line somewhere as to noise. Lanternists did not object to a small murmur, but anything approaching a hiss caused the greatest discomfort. He agreed with Mr. Beard as to the efficiency of mixing by means of alternate perforated discs separated by rings of wire. When the system was introduced (he believed by Mr. Lewis Wright) he saw it was a great gain, and the light was increased very considerably, and he found also that the nipple might be enlarged, and that all this was possible without any appreciable increase of noise. Secondly, he believed that the introduction of alternate discs, with gauze above and below in the mixing chamber, was a distinct step in advance, and the greatest step that had been made. He was not aware that anything had been produced, nor did he think anything was likely to be found just yet, better than lime. Mr. Otway, of Islington, had introduced an extremely good jet which was, he thought, the best for good illumination combined with quietness, and Mr. Beard's jet was little, if at all, inferior to it. With regard to mixing chambers in general it was necessary to make a compromise. The gases must be intimately mixed, but they must not jostle each other; they ought to follow from one part of the mixing chamber to another in a given direction, but they ought not to be impeded in their course, in order, among other things, to avoid noise and to ensure the most perfect mixing possible. There was a question which, if it were not old, he should like to ask: What was the reason why, with a saturator of any kind, the nipple had practically to be made larger? The proportion of the size of the nipple to the pressure of gas was very important; he had found that after fitting a regulator to his supply of house gas he had to proportionately alter the size of the nipple. Further, why was packing required with a saturator? *Primâ facie*, he objected to packing because he objected to "grit" in the gas way, and he used a saturator without any packing at all in the jet; when he had effected a larger insurance on his life, he might try to get an explosion, but for the present he preferred to leave that to more adventurous investigators. He agreed with Mr. Beard as to the colour of the light when using pumice-stone packing, and went further and said that with all saturators he got a degraded form of light. He moved a vote of thanks to Mr. Beard for his well-thought-out address, and remarked that it was a great matter to have papers by gentlemen who absolutely knew what they were talking about. The theoretical papers to which the Society sometimes listened were extremely useful, and they led to practice, but as a Society, and individually, they had to do more with practice than with theory, and papers such as Mr. Beard's, of a thoroughly practical nature and leading to improvements in their method of working, were what the Society wanted.

Mr. L. Warnerke, adverting to the remark that a better substance than lime was required, called attention to the fact that some eight or ten years ago he gave a demonstration in which a preparation of magnesia and silica was employed in the shape of a pencil which was imperishable, and lasted for weeks and even months without being spent in any way. Mr. Woodbury introduced a zirconia disc, which was not so durable.

The Chairman said an assistant of Professor Pasteur had made a mixture of zirconia which gave a beautiful light, but it was perishable.

Mr. Beard did not think the pencil of magnesia and silica would stand an oxyhydrogen flame.

Mr. Warnerke said it was not intended for oxyhydrogen with heavy pressure. He had used it for a small disc and got excellent results.

The Chairman said a lime had lately been put on the market which was claimed to be perfectly indestructible. A gentleman had given him a few of these limes, and he found that, if he turned a mixed jet on to them for two seconds, they vitrified, and then—look out for your condenser!

Mr. Beard, with regard to the saturator question, thought the reason why the Chairman had not had an explosion was because he had used plenty of ether. If every one took the precaution of using plenty of ether, there would be no explosions. It was only when the thing was worked dry that an explosive mixture was produced in the chamber.

ELECTRIC ARC LIGHTS FOR THE OPTICAL LANTERN.

[Lantern Society.]

The question often asked by those interested in the optical lantern, who have the electric current available at the hall or house where the projections are to be made, is What are the *requirements?*

First, as regards the *current*, if the lamp or regulator to be used is of the arc kind, it must be direct or continuous, and not alternating, and of six or eight ampères in amount and not less than sixty volts in pressure, generated by dynamos, or supplied from secondary batteries. Why I say this is, that sometimes it is asked, Cannot the electric light be produced by primary batteries? and the answer is, that the amount of electricity necessary is far in excess of what can be obtained by any convenient form of primary battery, and precludes its use except for very special purposes on account of the time, cost, and trouble of making up a forty or fifty cell Groves or Bunsen's battery, as had to be done in the early days of electricity.

In nearly all the large cities and towns very perfect installations have been arranged, and each month sees the number added to. After once the electric current is brought to our doors or into the house for the ordinary illumination by incandescent lamps, it is only necessary to run from one of the mains insulated wires of not less than 14 B.W.G. for one lamp, and larger size for two or more, to a convenient place for attachment to the lantern, a *safety fuse* being inserted that should prevent any short circuiting, or anything otherwise affecting the rest of the installation.

One hundred volts being the usual standard E.M.F. at which the current is supplied by public companies, *resistances* are required for each lamp. These can be made in various ways, but one of the most convenient is the one before you (figured in last number of The Lantern Record), because it allows of good air circulation to carry off the heat, platinoid wire being a most suitable material. The resistance represents so much current stopped back and converted into heat. It also acts as a regulator or compensator for variations in the electric supply. Other designs mounted in iron with iron wire coils can be used, as also one by the Carpenter Enamel Rheostat Company which is largely used in America. Forms like the latter, however (if I am informed rightly), are more of the kind that would make a suitable warming stove; whereas the tendency here in England is to have those that distribute the heat as generated, and Professor Fleming has recently designed one with very fine wire to achieve this end, that will shortly be placed on the market; but as a portable resistance I do not think this form can be improved.

I now come to the electric regulator, or *lamp*, which has been

reduced to the simplest form for practical and satisfactory work, in fact it has been devised because the automatic lamps, no matter how perfect, required attention and produced at times a flickering light.

We have not, unfortunately, here the current available for projection work, although it is in the hall, but the time, I trust, is not far distant when we can switch on the electric light to any lamp it may be desired to test or use. This form of lamp, designed by Mr. Davenport, is in use at the Society of Arts and the Camera Club, and can be seen there at the lantern exhibitions; while, for those of the general public interested in the matter, Mr. Steward, having current and all facilities for showing the electric lamp in action at his 406 Strand establishment, will be happy to do so between ten and twelve a.m., or three and six in the afternoon, or by special appointment. He has a biunial lantern fitted up with these lamps, and the tray is fitted with screws for getting a fine adjustment for vertical and lateral centering. By arrangement with Mr. Anderton, his clever lantern stereoscope is being adapted to the electric biunial, and can also shortly be seen in operation in the Strand. The lamp *carbons* are purposely kept as small as possible for lantern purposes, and the size adopted is 8 mm., being of the cored kind for the upper or positive, and solid for the lower or negative carbon. There is no reason why smaller carbons should not be used if a less light is wanted, and for certain purposes larger carbons (10 mm.) are already fitted to this kind of lamp where greater intensity of light is required.

The *adjustments* are first by the simple slotted plate, pivot and clamp, and second by the movable arm at top; while contact and subsequent arc-forming is obtained by the spring to the lower carbon tube, and rack and pinion to upper carbon. Extra adjustments can be arranged if found a convenience for delicate work, provided more than the adjusting plate is wanted. This hand-fed and semi-automatic arrangement is acknowledged by electrical experts to give a steadier light than any fully automatic lamp.

Many plans of making the upper carbon automatic in feed as well as the lower have been tried by the inventor of this lamp, but they all failed in some way or other, or were not so satisfactory to a lanternist, who having been used to the limelight makes no trouble of turning a pinion head, and so turns down the carbon mechanically the same as he has been in the habit of turning a lime every two or three minutes. The carbon will burn for five minutes without serious diminution of light, and the time to give attention will, if neglected, be apparent on the screen, but if within the specified time no one can see any alteration in the disc, either in brilliancy or evenness of illumination. The *candle power* of an arc lamp of this description is three times that of the best form of mixed gas limelight jet, which although estimated at various amount by different writers on lantern matters up to as much as 600 or 700 C.P. I should say can fairly be called without overstating, 400 or 500 C.P. We have therefore in this arc lamp a light of 1200 or 1500 C.P. in a most compact form and without any appreciable increase of heat or danger to slides. As regards *definition*, the small area of the light gives a decided advantage, and especially when used for high power (short focus) lenses and for the lantern microscope.

It will be seen that the carbons are not placed vertically, and that is because the arc in burning forms a crater in the positive carbon, making an opaque reflector of it and sending the light downwards; but, by placing the carbon at the angle shown, the light goes forward horizontally, and so greater illumination is obtained for use with any optical system placed in front of it.

Many little difficulties in connexion with the heating and softening of the spring have had to be overcome, but now with the modified arrangement fitted to this lamp, and the protection of all connexions, and safeguards against the falling of any minute particles of hot carbon, it has satisfactorily passed the County Council inspection, which is something to say in these times of agitation.

Some electricians have suggested and tried using a larger carbon for the positive, for it is known that the negative carbon when both are the same size burns away at approximately half the rate of the positive. Owing to the greater heat generated in the upper carbon, the spring or connexions for the feeding arrangement, as arranged for optical projection purposes, are apt to be affected, and the light is not so steady with a large size carbon to the top only as with the smaller carbon; while, if both are the same size, the positive carbon has to be twice the length, and then it would not on account of the mounting be so convenient for working in a biunial lantern or ordinary-size single lantern.

As to the *uses* of the electric light, it seems almost superfluous to mention them here, for it will occur to most that, besides the ordinary projection of lantern photographs and slides, better work can be done with micro-photography and some kinds of photographic printing and photographic enlarging, while spectrum analysis, chemical and electrical experiments, microscopic projections, and illumination of stage scenery and tableaux, besides stereoscopic, kaleidoscopic and opaque projections can be better performed.

Not the least important consideration is that of *economy*, for after once the apparatus is purchased (and it can be fairly said that the lime and electric of this form cost about the same at starting), the matter is all in favour of the electric light, as light for light the electric would cost 3*d.* per hour, while the lime would cost 1*s.* 4*d.* to 1*s.* 6*d.* per hour, used as oxyhydrogen, but to use the Davenport electric arc lamp as it is now arranged on a 100 volt circuit, with resistance, it would not be more than 6*d.* per hour inclusive of carbons, and this to obtain a 1200 or 1500 C.P. light. It is computed that this lamp burns less than one unit of electricity per hour, the unit being 1000 watts. We arrive at consumption by multiplying the ampères by the voltage.

Its *safety* is unquestionable, for all installations must be inspected before use, and, as to *general* adaptability to existing lanterns, there cannot be much doubt when the small size of this lamp is considered It is only 7¼ inches closed, and 10¼ inches with carbons in to last two hours. The convenience of switching on a light at any time without fuss, labour, or mess, is so great that many gentlemen with only a little leisure will, when once they know and understand the simplicity of an electric arc lamp optical lantern, take up lantern work and enjoy it.

I wish now to particularly emphasise a special point, and that is the great need of united action of societies to induce proprietors of halls to put on electric connexions so that lanternists can use the current at any time. It is too great a labour for any one man to undertake; but, if, as I suggested in THE LANTERN RECORD, each Society would take a district and tabulate the halls, schools, and public rooms that had electricity laid on, and co-operate to get the current available for projection, by, say, sending a circular letter pointing out the advantages for nearly all societies' use and also the proprietors' own benefit by making the hall available for more proposes without detriment. The nominal cost of the electricity could be charged for, or included in the rent of the place. On the Continent and in America they are considerably in advance of us, for the wiring of the French and Belgian theatres is so perfect that electric lights can be used in any suitable position on the stage or in the boxes, and so this light has quite superseded the lime in the more important theatres and places of entertainment. I trust the Lantern Society will take the lead or an active interest in this matter, and by the next meeting be able to announce that the current is available for trial of arc or incandescent electric lamps. The other societies meeting in this building would benefit by the arrangement, and, no doubt, co-operate in the matter, especially when they remember what is done at the Royal Society, the Royal Institution, the Society of Arts, and other places.

I fear I have extended my remarks somewhat beyond my original intentions, but I trust I have not wearied you in my description of the arc lamp and pleadings for electric light for the Lantern Society.

G. R. BAKER.

PRIMUS NOVELTIES.

W. Butcher & Son, Blackheath.

SEVERAL useful lantern novelties emanate from the go-ahead firm of Messrs. Butcher & Son, Blackheath.

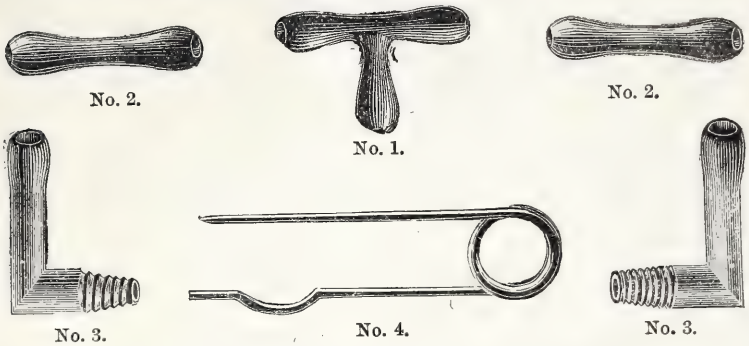
The "Primus" Carrier is a simple and effective form of carrier, made



of unpolished mahogany. The corner of the inner frame is cut away so that the slide may easily be placed in or withdrawn. It works admirably.

The "Primus" Gas Fittings Outfit comprises:—No. 1. One T connexion, for running gas from two cylinders, or the house gas from two brackets. No. 2. Two tube connexions, for joining together short lengths of rubber tubing. No. 3. Two elbows, for replacing the nipple on ordinary gas brackets when connecting rubber tubing. No. 4. One lime

tongs and borer, one side straight and pointed forming borer, and the other side bent to hold the lime firmly.

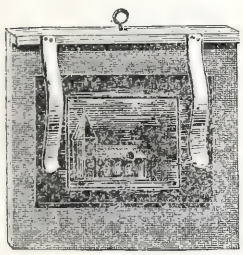


This is an exceedingly neat and handy little outfit, costing 2*s.* 6*d.*; the lime tongs are supplied separately at 3*d.* each.

The "Primus" Excelsior Limes, hard, are made the size found by Professor Faraday to give the most brilliant light, and for photography



are claimed to give the most actinic rays of any durable lime known. They are hermetically sealed, and can be sent abroad without fear of damage. Each lime is free from dust, being wrapped in paper. This latter point will be found advantageous by the busy lanternist.

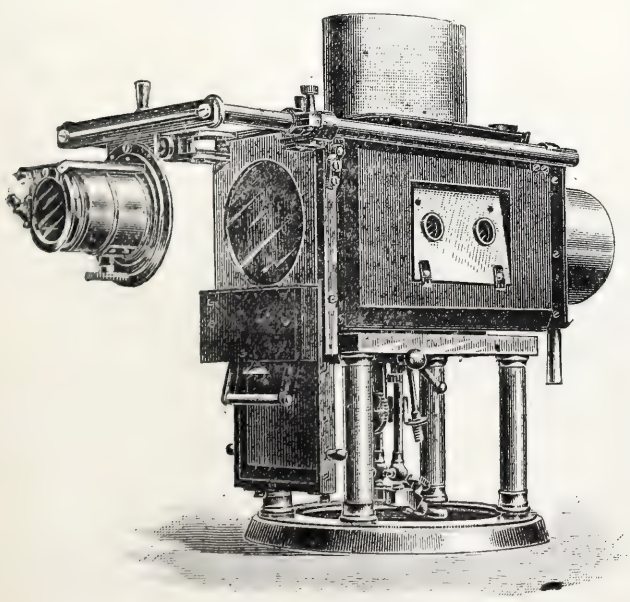


To employ the "Primus" Lantern Slide Printing Frame, the negative is placed face downwards upon the cloth-covered board and under the springs, as illustrated in the drawing. The loose back is then removed and the negative moved over the opening until the picture required is in position. The lantern plate is then placed in the opening film downwards on to the negative which forms the bottom. The back is then replaced and the spring adjusted, which holds the plate and negative in contact. Any number of lantern slides can be made from the same portion of a negative with ease. The frame is provided with a screw eye, so that it may be hung up in a certain position to the artificial light, when an average exposure can be easily ascertained. This will be found a cheap and serviceable printing frame for contact work.

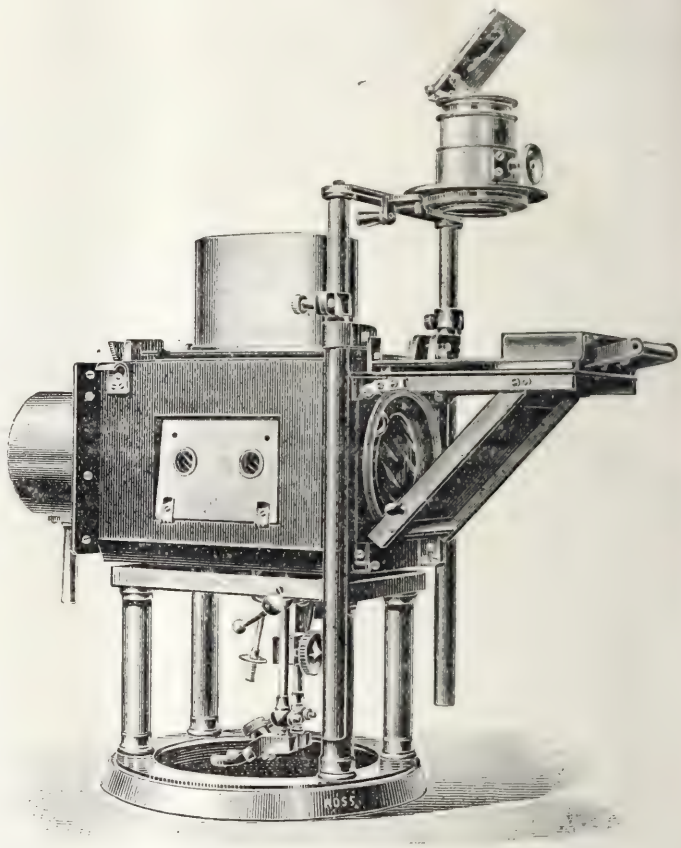
The "Primus" specialities for lantern work are evidently designed with regard to the practical requirements of the lanternist, and are, besides, as cheap as they are good.

ROSS'S NEW SCIENCE LANTERN.

Messrs. Ross & Co., of 111, New Bond-street, W., are introducing a new patented lantern for scientific projection purposes, designed to be practically effective, with as few complications and movements as possible. The instrument, as will be seen from the illustrations, is double-fronted, and each front carries a triple condenser of improved form collecting a large angle of light.



One of the ends or fronts takes slides, tanks, diagrams, &c., and a leading feature of this part of the instrument is a framed mirror which is pivoted towards the lower part of the stage; then, when the large cross handle seen in the front of the stage is grasped, the whole affair can be drawn up into the position as shown in the second illustration, and, the smaller mirror lying along the top of the objective having been brought into position against its stop, we have, almost instantaneously, a most



perfect vertical arrangement; the change back again is also made with equal celerity.

This method of attaching the mirror (which is the subject of a patent) is of great advantage, as there are no loose parts to get mislaid.

Another feature of the lantern is, that the stage plate is made of aluminium, and is instantly removed for cleaning after chemical experiments and suchlike; there is likewise a complete absence of the usual stage springs, which are often in the way. Everything is securely and firmly held, but instantly removable at will.

The long tubes afford a large range of adjustment when it is required to project apparatus &c., and the strain is distributed in an equal and perfectly effectual manner.

If parallel beam work is required, a handle projecting downwards from the large tube fitting at the other end of the lantern is laid hold of, and the body of the instrument swung round until this end or front is central with the light, the light itself having remained stationary. Into this end can be placed a Wright's optical front, slit front, microscope, polariscope, or other apparatus, and the various sections of the condenser are instantaneously removable for different classes of work.

The jet, a vertical one, is mounted on a traversing frame, and can be readily adjusted to and from the condenser by the ball-headed lever handle seen against the framework attached to the pillars of the lantern. The electric light can also be adopted if required; the doors are of aluminium, and, being kept in position by their own gravity, need no catch or fastener of any kind.

This new lantern is evidently the outcome of much thought and ingenuity, combined with a close knowledge of what is required in an instrument of such a character. For scientific demonstration purposes it includes every desirable movement within a comparatively small space, the method of placing the vertical attachment in position and replacing it when not required being especially clever and effective. It need scarcely be said that the lantern is beautifully made in all its working parts, and when set up is perfectly rigid and facile in its movements. Moreover—which, perhaps, is not the least of its many excellencies—the practical lanternist will find it exceedingly easy and smooth in the working.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*December 7, 1894*

THE LANTERN RECORD.

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LANTERN NOTES AND NEWS.

In the apparatus sections of recent exhibitions the lantern was well (and seasonably) to the fore. Messrs. Platt & Witte had a capitally furnished stand at the Hackney Exhibition; Mr. R. R. Beard's installation attracted much attention at the South London; while at the Stanley Show (Photographic department), Messrs. Bessus & Co. and Butcher & Son occupied spaces with collections of their most recent novelties. Perhaps one of the few things that can be said in favour of a plurality of exhibitions at this time of the year is that they afford opportunities of bringing the general public into contact with the latest introductions connected with optical projection.

* * * * *

Before the members of the Photographic Club, on November 28, Mr. F. W. Hindley gave a lantern lecture on *Ireland*. Mr. Hindley showed considerably over a hundred slides of excellent quality, and drew upon an apparently inexhaustible fund of anecdote. The entertainment was voted a great success.

* * * * *

Mr. E. H. Fitch, of Seldon House, Fulwood's-rents, W.C., is introducing a specially thick sensitised celluloid film for lantern slides.

* * * * *

Almost every branch of photography is taught at that admirable institution, the Polytechnic Photographic School. On Thursdays there is a course of instruction in lantern-slide making conducted by that excellent worker Mr. J. H. Gear. The following is an outline of the course followed:—"Slides by the following processes: Gelatino-bromide, gelatino-chloride, dry collodion, collodio-emulsion, and, if desired, the carbon process. *The Negative.*—Retouching, spotting, repairing defects and blocking out skies, &c. The introduction of clouds from other negatives into landscapes by contact and reduction. Various tones and colours obtainable by exposure and development, and by after-toning. Final treatment and finishing of slides. The principles of projection by the optical lantern fully explained and demonstrated. *Copying* maps, diagrams, &c., for demonstration and educational purposes; making the negatives for the production of slides. This section of the work is specially recommended to schoolmasters and teachers. *The Hand Camera* being a principal adjunct for the production of negatives for lantern slides, attention will be devoted to the successful manipulation of hand cameras *in extenso*. The advantages and disadvantages of various forms of cameras. Magazines *versus* dark slides. Lens, shutters, views—finders, &c The development of plates exposed in the hand camera will be fully dealt with." We give the above particulars believing that they will be welcome to many. The painfully poor quality of the average lantern slide nowadays suggests that instruction in correct methods of working is widely needed.

* * * * *

Messrs. Lea & Son, of Runcorn, send us their price-list of steel cylinders, valves, and fittings for compressed gases, manufactured by them. Their keys, unions, valves, &c., appear to be of the most improved forms.

* * * * *

The projection of glass positives, says the *Journal of the Photographic Society of Philadelphia*, upon a white screen by the aid of lenses and a powerful light has become so necessary to the lecturer who wishes to keep his audience closely in touch with the subject under discussion that it is almost universally the practice to use these attractive pictures as much as possible for illustration. It would be of interest if we could get the facts in connexion with the early use of the magic lantern in Philadelphia. In answer to a query in the *Sunday Dispatch*, a newspaper published in Philadelphia, under date of 1876, the late Thompson Wescott, an excellent authority upon Philadelphia history, makes the following statement:—"The first magic lanterns were imported from either England or France by the late Vito Viti nearly sixty years ago. They were rough-looking affairs of tin, with bull's-eye condensers and Argand lamps. Spencer Nolen, who kept a looking-glass store on Chestnut-street, where Jayne's building now stands, painted for Vito Viti the first lantern slides ever painted in America. Peale exhibited one of these lanterns in the old State House. I have reason to believe the first lantern was imported by Vito Viti, and that Charles Wilson Peale was the first person in this city to exhibit the magic lantern."

* * * * *

To make the filaments of electric incandescent lamps more brilliant, Messrs. Chancey & Depoux are said to soak the fibre in a solution of the nitrates of magnesia, zirconia, and lanthania, and the effect is said to be analogous to that of the Welsbach lamps.

* * * * *

It is suggested that the optical lantern might be usefully applied in the exhibition of photographic evidence in the Law Courts. In technical (patent) cases particularly there is much evidence given by expert witnesses that would be facilitated and made clearer if there were means at hand for projecting written chemical formulæ, free-hand sketches of machinery, &c., upon a lantern screen, so that the judge and jury could see them plainly and without difficulty.

* * * * *

Steps are to be taken, it is said, to suppress the use of the lantern for projecting nocturnal advertisements on the Nelson Column in Trafalgar-square, the National Gallery, St. Martin's Church, and

other edifices abutting on the "finest site in Europe;" but a special Act of Parliament will, it is understood, be necessary to accomplish that desirable end.

* * * * *

Archdeacon Shears thus writes of Messrs. Perken, Son, & Rayment's Optimus saturator: "I have tried many experiments with several saturators for optical lantern projection, and have come to the conclusion that the Optimus is by far the best. I never now use any other. The grounds of my preference are: 1. Safety. I believe the Optimus saturator to be perfectly safe. At one time I doubted this, therefore submitted it to very severe tests. If I try my utmost to get an accident, I do not know how to accomplish anything worse than to damage the apparatus itself. If the operator will keep the saturator well supplied with ether and oxygen, any mishap whatever seems impossible. 2. The jet is separate from the saturator. 3. For brilliancy of light obtained with perfect silence, I believe the saturator to be unequalled. I use the Optimus saturator with an objective of two inches diameter and fifteen inches focus, and can get perfectly illuminated pictures at any practical distance."

FINENESS OF DEPOSIT IN CARBON TRANSPARENCIES.

I do not suppose that, at the present day, many amateurs, if any, will use the carbon process for the production of lantern slides, although for quality of results, when properly worked, it is surpassed by no method extant. Its slowness, as compared with gelatino-bromide and collodion, and its limitation to contact printing, are against it, while the quality of the lantern plates now procurable leaves little if anything to be desired.

For larger transparencies, however, for any kind of decorative or ornamental purposes, it is a question whether any other process offers the same advantages as carbon, either in convenience, excellence, or cheapness. Taking the last quality first, the finished carbon transparency costs less than one-half the price of one made upon the cheapest of dry plates, the trouble is less than that involved in the accurate timing of exposure and development of the latter, and the range of colour is only limited by the colours of the tissues on the market, which are legion; and, finally, the results are quite above suspicion on the score of permanency. But, to secure to the fullest extent the benefits derivable from the carbon process when applied to transparency work, some extra precautions are necessary over and above those usually observed with prints upon paper, or even upon opal, although the remarks I am about to make apply in a minor degree to positives upon opal glass.

In the first place, the tissue itself for transparency purposes requires some little consideration. Naturally it will be assumed that the special transparency tissue is the best to employ, and, so far as merely mechanical considerations are concerned, no doubt such is the case. This tissue is prepared with a larger proportion of colouring matter to gelatine, which enables an image of a given degree of vigour to be obtained with less relief, that is to say, with a less thickness of gelatine in the shadows, which is often a great advantage in transparent positives, but especially lantern slides. The colouring matter, too, seems to me to be more finely ground, or to be in a finer state of division, as well as freer from accidental lumps or irregularities than the ordinary tissues for paper, another point of no little importance. But the tone of the transparency tissue—such, at least, as has passed through my hands—does not offer sufficient range to please all tastes; indeed, so far as I can recollect, I have never met with any but black. This, although a very agreeable shade for those who desire black tones, does not fill the want when brown or purple tones are required, and here the ordinary tissues prove very useful, and for transparencies of any dimensions give quite as good results as the special tissue.

The best tissues I have used for this purpose are the sepia, standard brown, and special purple of the Autotype Company, though, no doubt, the same colours of other makes may be equally good, especially the first, which is a colour that, in its natural condition, presents a beautifully smooth and even tint. Red chalk, and engraving black, even for subjects that they suit, do not make such good transparencies, owing to a certain want of fineness and evenness. The same may be said of a tissue of foreign make that I used some years ago, which, although on paper it gave wonderfully rich and transparent images, proved inferior for transparencies to the tissues I have named, of English make, on account of a slight suspicion of granularity.

Another point that requires attention is the age of the tissue after sensitising. If used too soon after drying, and when its solubility is at its highest point, the development is apt to be irregular and the "grain" of the image somewhat coarse, and there is in addition a difficulty in preserving the delicate details in the higher lights, which wash away, leaving a hard and patchy effect. When three or four days have elapsed after sensitising and drying, presuming, of course, the tissue has been properly kept in the mean while, it will be found to have acquired its best condition for use, the additional hardness or slightly decreased solubility it has attained conducing to greater uniformity in development, and preventing the loss of the given details, though perhaps the operation will be slower and a higher temperature necessary. It will retain its usefulness for transparencies until its insolubility has so much increased as to require very hot and prolonged development, when, although the fineness of the image will still remain perfect, there is a new danger of granularity and reticulation, as well as other mechanical defects arising from the difficulty of dissolving the gelatines. It is better on all accounts, therefore, to use the tissue when neither too new nor too old.

Before placing the tissue in the printing frame it is absolutely necessary to be sure that its surface is quite free from mechanical defects in the form of dust or crystals of bichromate—a not unusual occurrence. Besides carefully dusting the negative, the tissue itself should be treated in the same manner; not, however, in the gentle manner customary with the negative, but by brushing it vigorously with a rather stiff hat-brush or a dry cloth. However well kept, both during and after drying, there is almost sure to be some contact with dust; and, if a fairly strong sensitising bath has been employed, and the tissue thoroughly dried, it is by no means unusual to find a copious surface crop of fine crystals of bichromate, which do not add to the quality of the image on development. By the vigorous application of the duster, followed by a camel's-hair brush, these will be entirely removed.

The next case is in the preparation of the glass upon which the transparency is to be developed; this, it is needless to say, should be scrupulously cleaned and polished some time before it is required for use. It is then ready, after careful dusting, to receive the substratum employed to cause the tissue to adhere. For this purpose a five per cent. solution of gelatine containing a little bichromate of potash is usually recommended, but the length of time this takes to dry, and the comparative thickness of the layer form, in my opinion, objections to its use, and materially increase the danger of dust becoming attached to the surface. I greatly prefer the solution of albumen and bichromate I described in these columns a couple of months ago. It is easier to prepare, easier to apply, and may be dried off almost in a few seconds before a clear fire, where it is perfectly safe from all dust or other floating particles. It also forms so thin a layer on the glass that, even should a particle of dust adhere, it does not form so serious a defect as when the thicker film of gelatine is used, and, moreover, as it does not adhere so firmly, may in most cases be removed by dusting. The solution should be most carefully filtered before use, which its thinness renders very easy, and it should not be employed a second time without refiltration.

Next, on proceeding to mount the tissue for development, it is in the highest degree important that the water used should be perfectly free from floating particles of any kind. I am unfortunately dependent for my supply on water pumped direct from the well, without any kind of filtration, and find it absolutely necessary, for this purpose, to pass every drop, before use, through a thick felt bag to remove any particles of solid matter. It is well also to use two vessels of water in the operation of mounting, into one of which the prepared glass is placed to soak, in the other the exposed tissue; then, before the two are brought together, a vigorous stream of water should be allowed to flow over back and front of the tissue, to remove any fibres or particles of paper that may become detached from

the paper temporary support during the soaking. If these precautions be observed, there will not be much difficulty in securing perfect contact between tissue and glass, and subsequently even development.

In the latter operation, the principal rule to observe in order to get the finest image is to develop as slowly as possible—that is to say, to use the lowest temperature permissible; though, when the tissue has become partially insoluble, water at the ordinary or even a higher temperature may seem to have little effect; if time be allowed, it is surprising how the apparently insoluble gelatine gradually dissolves. For small plates, not larger than $7\frac{1}{2} \times 5$, I generally employ an ordinary zinc hand bowl, in which I leave the plate to soak *face downwards*, adding a little hot water at intervals until development is complete. For larger plates, a cork or other small object placed under one edge of the plate, placed face downwards again, will produce a similar result. A far better result is attained by exercising patience in this manner than by resorting to water at a high temperature, or by dashing or pouring it on to the surface of the print, which only results in unevenness of result, and perhaps mechanical injury.

Finally, after the transparency has been passed through the alum bath, it should be rinsed first of all with soft water, or water that has been boiled, and afterwards placed to soak face downwards in ordinary water to which a few drops of acetic acid have been added to prevent the precipitation of lime or other products.

If these slight precautions be observed over and above those ordinarily practised, the results will be better than can be obtained by any other method I know of making transparencies.

W. B. Bolton.

THE SEARCH LIGHT.

In a little over a week it has been my melancholy task to go and inspect six photographic exhibitions. Locally, there is a possibility that no harm or loss is experienced by this clashing, but on general grounds there is a great deal to be urged against it. In the first place, the various photographic papers can, as a rule, only deal with each exhibition with the utmost brevity, so that the notices must be short and perhaps inadequately appreciative; in the next the open classes, while being too much the reflections of each other, tax the outside exhibitor to such an extent that he perhaps is not represented by his best work; in the next the apparatus sections entail too much expense on those who support them from the necessity of having two or three stalls going at one and the same time in different parts of London; in the next the attendances must necessarily suffer. The trouble and inconvenience which this clashing causes the photographic press (but for which the various exhibitions could not exist) is so great, that I should not be surprised if next year united action were taken to prevent it. Secretaries of Societies, please note in the mean while.

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The successful hanging of a large exhibition of photographs is an admitted art; but I wonder if any of you have ever thought of the skill and care required to *un*hang a collection, especially where the available time is of limited duration. I witnessed quite a feat of unhanging on the closing night of the Royal Photographic Society's Exhibition. The last visitor left the gallery at ten o'clock, and in an hour and a quarter the whole of the pictures were taken down, stacked in tens, and the rings removed from the frames, ready for disposal the first thing the next morning. It may comfort the owners of the pictures to be told that they were handled with the most tender care, and that the unhanging Committee was a select and august one.

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The very large gathering of persons at the Lantern Society's Meeting on Monday, November 26, had every cause to be gratified, for in the way of lantern entertainments the one then given was undeniably pleasant and unique. Mr. J. Hay Taylor had arranged for the projection of a great many of the hand-coloured and designed lantern transparencies that found such great favour in the palmy days of the Polytechnic Institution. The old lanterns, dating back in construction nearly fifty years, which used to be employed in Regent-street were called into requisition on Monday week, and the entire systems worked with exquisite smoothness and freedom from hitch, while the effects were capitally managed notwithstanding, as Mr. Taylor said, no rehearsal had taken place. Of the slides shown I can only say that alike in colouring and design they struck me as being well worth going many a mile to see; certainly, in the way of projected pictures, I have never seen anything so beautiful and so artistic as these *chefs-d'œuvre* of Mr. Clare and Mr. Hill. The scenes represented comprised old Thames views from Oxford downwards; Baron Munchausen's Adventures; the discharge of a submarine torpedo; a series illustrating one of Hans Andersen's fairy tales; old-time coaching incidents; and many other popular topics. Mr. Taylor is to be congratulated, not only on the success of the entertainment, but also for affording an opportunity of viewing these delightful slides, which may possibly not recur.

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I am informed that the Exhibition of the Photographic Salon at the Dudley Gallery resulted in a net profit of over 20*l*. I was about to suggest to Mr. Maskell that this sum might be donated to the Photographers' Benevolent Association, but my readers will learn with regret, I am sure, that that body, like so many other institutions connected with photography, is not in a satisfactory state. The little interest taken in the Benevolent has, I gather, decided its Committee to discontinue its existence as a "going concern," and it will be allowed to die out. What a reproach to the photographic world!

* * * * *

The Central Photographic Club is dead. I was one of those who assisted to start it, and I am said to be one of those who helped to wreck it. Readers of this column will recollect that, more than a year ago, I strongly criticised the policy of the executive in conducting the Club too much on the lines of a talkee-talkee photographic society, and ventured to predict failure as the result of such a course. Events have demonstrated the soundness of my view. The Club was doomed virtually from its start, for, besides competing with existing photographic societies in the way of tiresome papers, demonstrations, &c., of which kind of entertainment there was already enough and to spare in London, it was openly made use of for advertisement purposes by certain persons, and, in various other ways that need not now be specified, courted ridicule and contempt. Such being the case, the view I took was that a Club run on those lines was not only not wanted, but that it was opposed to the ideas of its promoters, and that the sooner it was killed the better for all parties; and, as I have said, I am supposed to have helped to wreck it. *Requiescat in pace!*

* * * * *

The blackballing of Mr. Horsley Hinton at the Royal Photographic Society has caused quite an outbreak of hysterics among his friends, at which I am sure nobody is more amused than the object of their sympathy. To call that gentleman's rejection "a great and serious injury to the Society" is absurd, and I am persuaded that the last person in the world to think that the Society will lose anything but twenty-one shillings a year by the blackballing is Mr. Hinton. The Society resisted with triumph a much greater shock three years ago when seven or eight gentlemen ran away from it because they were not allowed to trample the rules and regulations under their feet. In regard to the Hinton incident, I fancy I saw in one of our contemporaries that he was "invited" to put up again. I presume the invitation came from his nominator and seconder; it was not official, at any rate.

* * * * *

I have great admiration for Mr. Hinton's talents as a photographer, writer, and draughtsman, and should have been extremely pleased to see him re-elected a member of the Royal; but, under the circumstances of the case, with which neither Mr. Chapman Jones nor Mr. Lionel Bennett (who wrote on the subject in a contemporary last week) appear to be familiar, I am compelled, even against my

own inclination, to uphold the justice of the members' action. Mr. Bennett and the editor of the paper in which his letter appeared, attribute Mr. Hinton's defeat to "journalistic spite." I have the best possible grounds for the opinion that this had little, if anything, to do with the result. Were it not that I should be breaking confidence, I could give the names of six self-declared blackballers who were quite removed from journalistic influence in the matter, and were certainly not actuated by personal hostility to Mr. Hinton. Had Mr. Hinton's nominator and seconder acted with a little worldly wisdom in the matter, that gentleman would have been a member of the Royal Photographic Society at this moment.

* * * * *

This blackballing incident, by the way, has not been without its humorous consequences. Some wag has persuaded Mr. E. J. Wall and Mr. Snowden Ward, who backed Mr. Hinton's nomination paper, that, as their nominee was rejected, the etiquette of the situation demands that his proposer and seconder should resign from the Society. Whereupon these gentlemen, with an emphasis and gravity almost verging on the ludicrous, announce to the world that they will *not* resign! What a fine subject for a *genre* photographic study: Mr. Ward and Mr. Wall clasping hands and vowing that they will never desert Mr. Micawber—I mean the Royal Photographic Society! But, joking apart, Messrs. W. and W., do you think anybody cares twopence whether you resign or whether you don't?

* * * * *

The amusing heroics which the subject of the two preceding paragraphs has elicited reminds me of some verses by Mr. W. S. Gilbert, one of which I will quote. They are called, "'To the Terrestial Globe.' By a Miserable Wretch," and this is verse 2:—

"Roll on, thou ball, roll on!
Through seas of inky air,
Roll on!
It's true I've got no shirt to wear,
It's true my butcher's bill is due,
It's true my prospects all look blue—
But don't let that unsettle you!
Never *you* mind!
Roll on!

[*It rolls on.*"

Notwithstanding all the screaming of the last week or two, I fully expect the Royal Photographic Society, like the terrestrial globe above apostrophised, will "roll on."

* * * * *

I have occupied so much space with topics of current gossip that I find, on reference to my note-book, I have still several points of more practical interest to discuss; these, however, I must perforce hold over. Just a word or two, nevertheless, on my pet craze, stereo-photography. At all the exhibitions I have been to lately, I have been pleased to notice many excellent binocular transparencies and slides; but I was sorry to find a very common fault with a great number of them—that is, too wide a separation of the centres, these in some cases exceeding $3\frac{1}{8}$ in., and even $3\frac{1}{2}$ in. Three inches, for most subjects, should be the maximum distance, while the nearer $2\frac{3}{4}$ in. it can be the more readily will the proper effect be obtained in the stereoscope. At the Leytonstone Exhibition, that enthusiastic stereographer Mr. A. P. Wire had his customary stand of stereoscopes and slides, among which was a large Wheatstone reflector made by himself.

Radiant.

LANTERN MEMS.

As it is far more difficult to get music out of a violin with only one string than with its complete complement of four, or for a performer on a bugle to obtain more than a certain limited number of notes, as compared with a cornet, so a writer on optical lantern matters has to cudgel his brains to a greater extent for subject-matter each month than if he had an every-day or political topic to write on; and after all, although popular, optical projection is not an inexhaustible subject.

* * * * *

Fortunately, every now and then, if a decided novelty is not introduced, there is a variation or modification that merits attention, or else a "harking back" to something old that is still of interest, and so (to keep up the simile) a fantasia is possible if a symphony is not. It is a long time back to the days of the old Polytechnic if one counts the years, but it seems only a little while when one has something to bring it forcibly to the mind.

* * * * *

Such an opportunity occurred at the Lantern Society, on Monday, November 26, when the room was crowded to overflowing to see the glories of Old Lanternia, as represented by the beautiful pictures that gave such pleasure in the past, but which, unfortunately for the public, were dispersed at the time of the closing of the old institution. However, thanks to Mr. Wilkie being in possession of a fair number of the best large slides and a pair of suitable lanterns, Mr. Hay Taylor was able to give the audience a rare artistic treat.

* * * * *

With an area of glass represented by dimensions somewhere about eight inches by six inches, the artist in the old days had scope for drawing and painting of a character that is difficult and trying to a degree, if not bordering on the impossible, at the present time when lanterns of ordinary construction will not show larger transparencies than three and a half inches diameter as circles, or three inches as square, and the examples of Clare, Child, and Hill serve to show what splendid pictures for projection first-class hand-drawn and painted subjects are.

* * * * *

There was no half-heartedness about the applause that greeted the "gems" of the collection, although all shown had so much merit that that section of the lantern world who cry down coloured lantern slides should be silenced for all time if such work can now be produced. Fortunately, there are still some artists who have mastered the art of glass-painting for projection, and their ability is such that there would be no difficulty in equalling, if not rivalling, the results of past time given similar opportunities, but, by force of evolution of the lantern, this is not present in the ordinary way on account of the decreased size of the apparatus.

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Those who are behind the scenes know there are only three or four artists that can execute hand paintings in first-class style, and they are, as a rule, full of work; but there are two or three London houses who stock their work and can show any one interested, by means of magnifying glasses or actual projection, what marvellous productions they are, and it is only when the purchaser expects to get for a few shillings what has taken the artist days perhaps to paint, and is, in fact, a work of art in miniature painting, that he may feel as the fox did with the grapes when they were out of his reach.

* * * * *

No doubt the feeling in some quarters against coloured slides, even those with photographic bases, is due to the excessive competition, and the desire to cheapen every thing, having flooded the market with slides very little removed from the penny plain and twopence coloured order, and I don't wonder at the outcry of some of the correspondents of this Journal about the decadence of some lantern entertainments, brought about by this and the use of hired slides.

* * * * *

In the good old days the word hire was like the red rag to the bull, and it was not until force of circumstances compelled, that opticians and lantern dealers fell in with the altered state of things, and hired slides to their customers. If a plebiscite were now taken and candid information given, I question very much if the houses that are hiring slides at the very low rates, would find that they get

common interest for the capital invested in slides, for it must be borne in mind that many subjects that have to be stocked are seldom asked for, and so cannot earn anything.

* * * * *

THOSE who have high-class stocks containing subjects not easily duplicated, especially when well coloured, still preserve rates of hire that are reasonable to the user, and also fairly profitable to the stock-keeper, and yet far more economical than the original charges, which were ten per cent. of the value. Although the names of lantern dealers are now legion, and the number has increased far in proportion to the augmentation of lanternists, yet there is still, and likely to be, a fair amount, plenty of employment for producers of high-class work, whether in apparatus or slides, as long as perfection and novelty are the ends in view.

* * * * *

THE use of gas bags is now of so rare an occurrence that one hardly realises that they formed a very serious part of the lanternist's equipment in times not so far back, but when they are brought into notoriety by an explosion occurring, as it did, at Mason's College, Birmingham, one cannot help thinking, with all the trials and troubles of cylinders during the past few years, it is as well that we have steel gas-holders instead of rubber ones, for there is safety, as far as limelighting is concerned, in forward pressure, and danger in back pressure, such as, I believe, to be the case in the instance referred to, when a suck back occurred by removing the weight from the bag without first turning off the tap.

* * * * *

WE hear of safety this and safety that; but, unless a certain amount of common sense is used, the safest of safety apparatus can be made dangerous. I recently heard of a case where the inventors of a machine tried everything they could think of to bring about a difficulty in working, and could not; but, in the hands of the workman, after it was in use, a trouble soon occurred, and this makes me think of ether saturators, which have been tried to be exploded and failed, but have, in the hands of lanternists, gone wofully wrong. The golden rule with saturators is to keep them well charged, much the same as I have said before with the gas—let there be a good forward pressure.

* * * * *

THAT the ether light is a splendid one, there can be no denying; but that it should be sold and used *indiscriminately* I think is a very questionable policy, and, as to the conveyance of the sulphuric ether, there is, and always will be, a difficulty. In experienced hands, and for out-of-the-way places, at home and abroad, there is no doubt; it is a great boon, for it dispenses with the making of pure hydrogen, which is a troublesome job; and, if the apparatus is specially constructed, there is no difficulty with ether saturators supplying two or three lanterns, and permitting of dissolving as perfectly as with both gases under pressure; but if not properly made, or imperfectly filled, then there must not be much surprise if the result is an explosion.

G. R. BAKER.

THE ELECTRIC LIGHT IN THE OPTICAL LANTERN.

THE following suggestions may be of assistance to lanternists who are not so practised with the electric light as with the gases, as well as to those who are more experienced.

Every operator who may have to work with the electric light should endeavour to master at least the elementary laws which concern the production and application of electricity. The terms, however, which are in general use, are—

Volt, the unit of electro-motive force or pressure;
Ohm, the unit of resistance; which two factors govern the
Ampère, the unit of quantity or strength of current.

The electric current as supplied by the Lighting Supply Companies may be described as of two kinds, *alternating* and *continuous*. It is desirable, in the case of arc lamps controlled by automatic gear, to ascertain whether the current is "continuous" or "alternating," as, unless the lamp is specially arranged, it may not work with the latter current. Lamps, however, which are fed by hand gear, burn on any circuit. With "alternating" currents, the carbons burn at equal rates, but with "continuous" currents one carbon will burn considerably faster than the other.

A little inquiry on this point may save unnecessary trouble.

The pressure at the Supply Company's mains is usually 100 volts, but at the lamp it should not exceed fifty volts. A "resistance" must therefore be inserted between the lantern and supply terminals, which has the additional advantage of steadying the light.

The principal—and, indeed, the only—danger with the electric light is that known as "short circuiting," and this danger may be entirely obviated by the use of suitable safety fuses or "cut-outs," which should be arranged to cut off the supply to the lantern if the current at any time exceeds the normal by fifty per cent.

Care should be taken that the current taken by the lamp does not exceed the maximum for which the wires, &c., were laid.

A simple but efficient electric light for the lantern can be made at trifling cost, using "Jablochoff candles" (an old form of electric arc lamp consisting of two pencils of carbon cast with but electrically separated by a layer of kaolin or fire clay). The "candle" holder should be screwed to a block of wood, to be so attached to the lantern tray that the "candle" is horizontal and central with the condenser. Of course, as the carbons burn, the arrangement must be moved towards the condenser, so as to keep the correct focus.

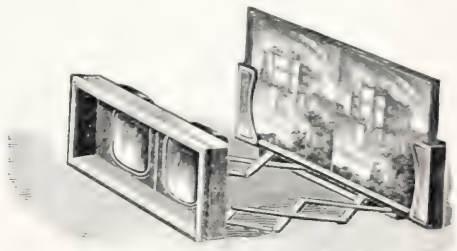
A 100-volt incandescent lamp connected *across* the terminals of any arc lamp helps to steady the light very much. In places where provision is made for the lantern there will, of course, be no difficulty; but, where the mains are at some distance from the proposed position of the lantern, great care should be exercised in making connexions, &c., and in fact, this work should not be undertaken without a practical knowledge of what is required.

C. HIGGS.

DAY'S PORTABLE STEREOSCOPE.

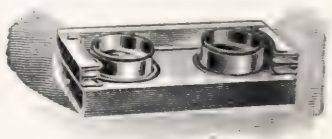
J. Day, Scout Hill View, Dewsbury.

THE term "portable" is singularly well applied in this case, as the stereoscope of Mr. Day, when closed, measures only 5 inches by 2 inches by 1¼ inches. As shown in the first illustration, it is fitted with



prismatic eyepieces of the usual type. It is opened by simply drawing out the collapsible cross pieces of the "lazy-tongs" type. The back part is fitted with double grooves, and this, in its turn, expands or contracts as the focus is lengthened or shortened. Instead of the prismatic eye-





pieces achromatic lenses are fitted to an improved form of the stereoscope, the lenses admitting of being separated.

Certainly this is a very neat and handy form of stereoscope, skilfuly contrived and elegantly made; and, now that binocular photography has entered upon a renewed lease of popularity, Day's portable stereoscope should find great favour. It may readily be carried in the pocket, and is instantly set up for use.

THE FLASHLIGHT IN MINE PHOTOGRAPHY.

MR. H. H. BUCKWALTER thus describes his mode of photographing in mines:—

"The first mine visited was reached by riding in an ore sleigh. The mine had previously been leased, and the lessees had cut a tunnel that will ruin their chances for the hereafter. The bumps on the writer's head were entirely obliterated before 100 feet had been travelled. During the next 100 feet new bumps had been formed. At the end of the tunnel a 500-foot incline was reached. This incline was at an angle of forty-five degrees, and it was almost impossible to walk up and carry

cameras. Besides, it was caving in, and was so low that a car could just get up by cutting an occasional slice out of the top timbers. After putting the apparatus in the bottom of a car, the writer got in and curled up. Repeated warnings were given by the attendant in charge in regard to rising above the edge of the car. The warnings were remembered after starting without trouble. All the writer now cares to remember are a series of jolts, bumps, sounds of crushing wood, and getting out at the top covered with splinters and chips. The location of one of the subjects was at the end of a short tunnel running from the top of the incline. At the breast of this tunnel an air drill was in operation. Two flash lamps were placed behind the camera, one directly behind and above, and the other a few feet on the right. The first flash was a failure. A current of air blew the smoke from the lamps directly in front of the camera. The result, as afterwards seen by development, was only fog. The next plate was not wasted. The man operating the air drill opened a valve after the first flash, and the escaping air quickly blew the smoke out of the tunnel. When everything was ready for the second exposure, the air valve was again partly opened, and the result was perfect. The air drove all the smoke and floating ashes back, and a good negative resulted. The same dodge has been frequently used by the writer, and always successfully. It is worth remembering.

". . . . . The method of lighting was as follows: Behind and above the camera was placed one lamp. On the left and several feet away was placed the second. About fifty feet ahead and fifteen feet on the left was placed a charge of explosive compound. At a similar location on the right, but a few feet nearer the camera, was placed another charge. These two charges of explosive flash were out of range of the lens on account of intervening timbers. Each charge was made up of nine of the largest-size flash cartridges. At a given signal both lamps were started, and before they were emptied the explosive charges were ignited.

"A good rule for using flash lamps and explosive flash is to have the greater source of light at a short distance on one side of the camera, and a lesser source, or 'shadow softener,' above the lens. The result is a softness of shadows that gives depth and roundness. A lamp giving a vertical flame, like the Prosch, is preferable to the horizontal flame. The former blows the smoke and ashes above the lens, while the latter too often throws it forward. A broad flame is preferable to a narrow one, as it has considerable 'softening' effect.

"In placing a large charge of explosive flash, the writer placed it in a long row instead of a conical heap. Quite frequently a small quantity of pure magnesium is poured over the top. It is much slower to ignite, and therefore increases the height of the flame. Too much must not be used, or it will be blown up without igniting.

"The prime thing to be remembered is having plenty of light. Flash-light does not 'carry' very far, as in deep subjects it is necessary to place sources of light in front of the camera, to help out the object beyond the reach of the light behind the camera. Especially is this true of mines, where the surroundings absorb instead of reflect light."

A CHEAP LANTERN SCREEN.

The sheet or lantern screen is an important item in the lanternist's outfit. The amateur home worker usually borrows a sheet or uses the white wall of a room. The latter is probably the best screen obtainable, for practically no light is lost. But walls of the proper kind are but seldom found, says *Anthony's Bulletin*, and, even if such a one is at hand, the lanternist has to encounter considerable opposition when he commences to remove pictures and shift sideboards. The borrowed sheet, too, is a nuisance. The president of the household naturally objects to the driving of tacks through her best bed linen, and other devices for hanging the sheet usually fail to command her approval. And, if this difficulty is overcome, there is always much trouble in properly stretching the screen without doing damage to walls and woodwork. Every possessor of a lantern should own a lantern screen which is white and opaque, compact and portable, and always ready for use.

The size of the screen is, of course, governed by the size of the room and the capacity of the lantern. Having decided on this point, purchase sufficient unbleached calico of good quality, and have it sewn to make a sheet of the size fixed upon. The sewing must, of course, be very neatly done, so that the line of joining shall show as little as possible. This sheet, tacked upon rollers and used so that the seams run horizontally, will serve as a lantern screen, but a vastly superior article may be made with but little trouble. If the lantern be lit and the sheet illuminated, the circle of light will be very plainly visible from the back. This means that a great deal of light is being lost; that, in fact, the best possible result is far from being attained. It remains therefore to so treat the calico that it shall be opaque and white. Make a strong frame of the size of the screen by nailing pieces of wood together. Soak the calico in a pail of water, wring well and tack it down to the wooden frame, stretching it well. Drive a tack in each corner, going around the screen and not diagonally. Tack down one side completely and then the side opposite, pulling the calico well before driving in each tack. Then the other two sides are treated in the same way. On drying, the calico will be found tightly stretched and without a crease. It must now be well sized and then covered with a white paint made by mixing whiting with size. Care must be taken, when brushing on the latter, not to obtain any streakiness. If plenty of the mixture of whiting and size is used, there will not be any difficulty. If there is plenty of storage room in the house, the sheet may be left stretched on the frame, and will in this way be very serviceable, as hanging is dispensed with. This, however, is hardly satisfactory, as there is always danger of distortion and of the puncturing of the sheet by leaning things against it. Again, the sheet is liable soon to become dirty. The best way is to cut it off the frame with a sharp knife and to tack it on a roller, the seams running parallel to the roller.

The bottom is turned up about one inch and sewn over a lath. Indeed, the screen resembles almost exactly a large window blind. In this way a capital sheet may be made, which is opaque and portable and is not easily damaged.

LANTERN-SLIDE HINTS.

"A properly made lantern slide," says a writer in an American contemporary, "is a thing of beauty and a source of much pleasure. While the writer does not claim any new feature for these suggestions, they may be useful to those camerists whose experience in slide-making has been limited.

"Making your own plates is not profitable. Of course the wet-collodion process is recognised as the best, but it is only so in experienced hands.

"The gelatino-albumen plates on the market now are greatly superior to the wet plates in ordinary hands. This refers to bromide emulsions, or plates which must be manipulated in the dark room. If the amateur wants to make his own plates, however, a collodio-chloride emulsion is suggested. Whatever emulsion is used, the plates must first be chemically clean. A bath of weak nitric acid, followed by thorough washing and rinsing in hot water, will be sufficient. Then the plates should be coated on one side with a substratum of albumen and water to prevent frilling. The emulsion is flowed on the coated side when dry. Separate or combined toning and fixing baths may be used with the chloride plates.

"After much experimenting the writer has settled on amidol and hydroquinone for developing Carbutt's gelatino-albumen plates. A developer that will give delicate detail and clear high lights is as follows:—

"Hydroquinone	10 grains.
Amidol	10 ,,
Sulphite soda crystals	100 ,,
Hot water	6 ounces.

"The hydroquinone is first dissolved in the water, and sulphite and amidol added as named. An acid fixing bath is recommended; Dr. Eder's, previously published, is probably the best, on account of having no alum.

"The exposure of the chloride plates will generally be by contact. They should be printed until the high lights are faintly tinted. They will bleach during toning and fixing. The bromide plates should have generous exposure to get full detail. A negative with much contrast should have longer exposure in proportion than a negative weak in contrast. An under-exposed slide from a thin negative will give better contrast, and an over-exposed slide from a dense negative will soften the contrast. The terms over and under-exposed are not meant in their extreme sense, however. A little experience will dictate the proper procedure.

"Most slides are made by reduction in the camera. Special apparatus will be required, though it may not be expensive. If the amateur has a tripod camera, with swing back and reasonably good lens, the extra parts are easy to make. Taking a 5×8 camera, and lens of eight-inch focus, the following will answer: Make a box of half-inch wood, with inside dimensions of eight inches each way, and open on two opposite sides. Another box should be made to fit over the first. One end of this box should be open, and the other have a hole cut in the centre to admit the lens attached to the camera. Both boxes should be blackened inside. One end of the inside box should have strips fastened to hold the negative, and behind that a piece of ground glass. By sliding the inside box, the distance between the negative and lens may be varied, and the image on the ground glass of the camera gotten the proper size. The operation will be easily understood. Kits will be required for carrying the slide plate in the plate-holder. Two clean 5×8 glasses are needed when slides are to be made from film negatives. The 'film side' of the negative should always be nearest the lens. The object of the swing back is as follows: Frequently negatives are made by hand camerists, who do not hold their cameras level. The well-known distortion results. This may be partially rectified by using the swing back when focussing for the slide. Start with negative and ground glass parallel, and incline the back until the lines are straight. It may be necessary to reverse the position of the negative, unless the camera has a centre swing, but the operation is extremely simple. A small stop must be used in the lens. In mounting lantern slides the gilt side of the mat should always be the same way as the film on the slide. A narrow strip of white paper pasted on one end of the back of the slide is convenient for labelling, and also easy to see

when exhibiting. During the exposure of the slide in the camera, care must be taken that the apparatus receives no shock or jar, or the image will not be sharp."

LANDSCAPE AND CLOUDS COMBINED IN ONE NEGATIVE BY THE CARBON PROCESS.

[Photographer's Record.]

EVERY ONE who has printed clouds from a sky negative into a landscape must have experienced a difficulty in bringing brilliant clouds exactly up to, without encroaching upon, terrestrial objects. Several methods of overcoming the difficulty have been devised, and each worker has his own pet method. The following plan may perhaps be useful to those who have not yet found a method to their liking. The method at first sight may appear expensive, but, even if only a few prints are required from a negative, the trouble of making a negative in which the clouds are combined with the landscape, and from which the required number of prints can be made by plain straightforward printing, will be as nothing compared with the trouble and expense attending the production of the print when the clouds have to be inserted in each by double printing, with the concomitant loss of material and time in waste prints.

Expose a piece of transparency tissue behind the landscape negative in the usual way. It may, with advantage, be a trifle over-exposed; that is, the highest lights should not be absolutely clear. Squeegee the tissue upon a sheet of celluloid a size larger than the negative. The celluloid requires no substratum, as the tissue will not frill or reticulate upon it as it does upon unprepared glass, unless extremely hot water is used. It may here be stated, for the benefit of those who sensitise their tissue, that celluloid is an admirable substance to squeegee the tissue upon for drying, as it requires no talcing, and all risk of breaking or cracking the tissue in stripping is avoided, as the celluloid can be bent in stripping while the tissue is held flat.

Develop, and wash the transparency thoroughly. Smears that might not be noticed in a print will impair the usefulness of the transparency. Dry where dust cannot settle upon it, and expose to daylight to harden the image. Dark-toned objects projecting into the sky will mask themselves when the clouds are printed in, but lighter objects must be blocked out. This is best done with Bates's black. Lay the transparency face down on a sheet of white paper, and with a fine-pointed brush fill in all light objects above the sky line. When glass is used as the support, it is impossible to do this with accuracy, owing to the distance intervening between the image and the surface upon which the varnish has to be laid. With celluloid no such difficulty will be experienced, but care must be taken not to overlap the image. Having blocked out these objects, a piece of red or black paper should be gummed over the landscape, shielding it from the horizon downward, leaving the sky portion clear. If the clouds had to be repeated in a river or pool, the water must also be left clear, and light-toned objects round the banks blocked out. It should be noted, however, that a very faint colouration in the transparency is sufficient to form the mask in the next operation, and consequently little blocking out is required. A strip of the black or red paper must then be gummed round the image, defining the limits of the picture. This acts as a safe-edge, and assists in placing the cloud negative in position. The necessity for such a guide will be perceived later on. All this blocking out and masking must be done upon the celluloid that is on the back of the transparency. The exact height of the horizon line should be clearly marked upon the marginal strips.

For the next operation the worker must sensitise a piece of the transparency tissue for himself; ready-sensitised tissue cannot be used. As soon as the tissue is limp, slip the transparency under it and bring the two into contact while in the bichromate solution, taking care to avoid all air bubbles. The marginal strip of paper will show the position to be occupied by the tissue, which must cover the whole of the picture. Take out of the solution, and squeegee gently, but firmly, into close contact without shifting the position of the tissue. Pin the celluloid down upon a board, and dry it in the dark. It is necessary that the celluloid should not be allowed to curl up, as in flattening it out the tissue may fly off, taking the image with it, and the work will be lost. When dry, the bichromate stains must be cleared off all portions through which the light is to act, without disturbing the black varnish. Exposure is then to be made for the clouds. As the image on the celluloid is lost in the blackness of the tissue, the horizon mark, marginal strips, and paper pasted across the landscape are the only guides to position. If the clouds are to be repeated in the water, this must be temporarily covered over while the sky is printing. When this is done, uncover the water and shield the sky. Turn the cloud negative upside down with the gelatine side away from the transparency, and print the clouds into the water. Of course, careful actinometer tests must be used in making the exposures. The celluloid is now placed in the developing dish. As the water can only penetrate the tissue from the one side, rather warmer water and a more prolonged soaking will be necessary than in ordinary development. When the tissue is sufficiently softened, the paper support is stripped, and development is proceeded with in the usual way.

And now the full advantage of the method will be perceived. The darker objects will have completely shielded the tissue from light action, and consequently they are not deepened in tone, while, in printing both cloud and landscape on the same sensitive surface, a dark cloud will always impart an increased depth of tone to the objects over which it is printed. It will also be found that, if the sky has been a trifle under or over-exposed relatively to the landscape, it is well within the power of the worker to correct this in development, while, if both were printed on the same piece of tissue, it would be impossible to alter the tone of the sky without affecting the strength of the object projecting into it. Should the sky prove to be hopelessly under-exposed, or so much over-exposed as to be too brilliant or stormy, it can be entirely removed by hot water, assisted, if necessary, by the gentle use of a camel's-hair brush, leaving the landscape intact for a second attempt. This, however, will not be possible if the sky is grossly over-printed, nor can it be done if the print is allowed to dry and harden.

When the correct effect has been secured, and the transparency dried, a negative is made from it on transparency tissue. This will not be reversed; but, if made on celluloid, it can be printed from either side, and, when used as a reversed negative, there will be very little loss of definition.

The original negatives and transparency may be packed away secure from injury; and, if the carbon negative is injured in the course of working, it can be replaced at little cost.

A variation of the process may also be interesting.

It sometimes happens that, to secure a negative well exposed in the shadows, the sky has been partially reversed, and prints out a dark grey, giving a gloomy effect to the print. To block out such a sky when the horizon line is broken, or when trees rise into the sky, is not an easy task. A few light fleecy clouds judiciously placed would relieve the dark expanse, and give it the appearance of a dark blue summer sky flecked with clouds.

To paint such clouds in would be inadmissible, as being outside photographic methods. Select a suitable sky negative, and make a carbon transparency; at the same time soak the landscape negative in the bichromate solution; dry, and expose to daylight, to make the film insoluble in hot water. From the transparency a carbon negative is to be made. As we cannot shield the trees, &c., projecting into the sky of the landscape negative, the clouds must be confined to the portion of the sky which is clear. To do this, the transparency must be vignetted, only those portions required being allowed to print. This can only be done with a sky in which the clouds are soft and faintly defined.

The exposure for the carbon negative must be very short, as only the white clouds in the transparency are to show, the other portions of the gelatine having to be washed away. The landscape negative and the carbon sky negative are now immersed in water, and, when the tissue is limp, brought into contact, taken out of the dish, and squeegeed together, and the tissue developed in the ordinary way. If the operations have been successfully performed, all that remains is to dry and varnish the negative. Should the sky prove unsatisfactory, it can be removed, while still wet, without injury to the negative, by gently rubbing with the tip of the finger, and another attempt made.

The operations may seem to be involved, but, with care, are easily carried out, and the results are such as cannot easily be obtained by the ordinary methods of masking.

THE INCANDESCENT LIGHT APPLIED TO THE LANTERN.—Mr. E. J. Cope writes to the *English Mechanic*: "Those of your readers who are interested in the lantern will be glad to hear of a good and safe light—one that is nearly, if not quite, equal to limelight, and has the advantage that only one gas (coal gas) is required, and requires no attention after it is once lit. I have an idea that the burner might be arranged to burn methylated spirits or benzoline, and so dispense with the gas. For some months, since first seeing the incandescent light, I have thought it would be a great improvement on the oil lamp, and be less trouble to work than limelight, besides saving the expense of oxygen and the carriage of the cylinder. Last Saturday night I tried it. I had two lanterns, one fitted with the incandescent light, the other fitted with a three-wicked oil lamp, and they were worked as dissolving views. The result was one yellow picture and one bright one alternately. It surpassed my expectations. In fitting it to the lantern I was obliged to make a fresh Bunsen burner, as the one supplied was too long and raised the light above the centre. I also cut the chimney much shorter, and used a reflector behind the light. Most people will think the 'mantle' which is made incandescent and gives the light a very delicate thing. So I thought once. The one used was with the burner wrapped in paper (care being taken to keep it about upright), and carried in the hand for a mile. I fully expected to find it had fallen to piece; but no, it was as perfect as when I took it out of the lantern, and is in use now for ordinary lighting. In any case, if you spoil one at each exhibit, the cost is only 1*s.* 3*d.* each, as compared with the price of oxygen and the carriage of the cylinder."

NOVELTY IN STAGE SHOWS.

Mr. Alexander Black's Kinetoscopic Comedietta.

[Photo-American.]

A company of men and women interested in art and literature, gathered in the studio of Mr. James Lawrence Breese in the Carbon Studio Building, 5, West Sixteenth-street, one evening, expecting to see something which should combine their diverse interests in a novel manner. They were not disappointed.

This is what those who saw saw. In one end of the studio was a screen-hung stage, in the other a magic lantern. Between, in the shadows of the darkened studio, was the audience. Somewhere out of sight was Mr. Black, and somewhere else an organist who supplied incidental music.

A picture play consists of two parts, which must be described separately. There is the play, the book, and that is read; this night it was read by the author. *Miss Jerry* is the story of a girl, a kind of Bret Harte heroine, who comes to New York from Colorado with her father. She is a good girl, Jerry is, from the foot hills of Red Horse Mountains, perhaps, and thinking that her father is nearer broke than happily turns out to be the fact, she seeks to supply something more than the continuation of the menu of "Casey's Tabble Dote," by directing her talents into a newspaper office. Of course, she does.

She interviews a city editor, who gets even, by sending her to interview a Colorado mining man, staying at the Fifth Avenue Hotel. The book is founded strictly on romance. Jerry does not find her landman in the Fifth Avenue Hotel, but happens to meet him at an evening reception, where she learns the secrets longed for by the city editor, and the next day he calls, when she completes her interview, and confesses her honourable intention.

There are more newspaper scenes, in which Jerry is so pretty, that the city editor falls in love with her—oh, Mr. Black!—everybody's mining hopes are realised; wealth comes all around, except to those who marry their own true loves—and there you are for a pretty story.

Well, while Mr. Black is reading this story out of sight, pictures begin to appear, thrown on the screen by the magic lantern. The pictures are carbon prints of photographs of the characters in the play. There are more than three hundred of them, and they softly succeed one another on the screen, as the history of Jerry's ambitions, struggles, domestic relations, society excursions, street walks, and professional duties is told from the book. Jerry is shown in half a dozen poses and emotions, in the city editor's office, she is seen entering the Fifth Avenue Hotel, at Mrs. Blank's evening reception, and there are shown, also, several groups of society people in different rooms.

These photographs required the use by Mr. Black of twenty-five or thirty different models, who were selected and costumed with excellent taste and judgment, to illustrate the text of the play. When Jerry is having a nice quiet talk with the missing man. in a nice quiet corner, she is claimed and whisked off by a dancing detrimental, and that d. d. is just the kind of a young man who does that sort of a thing with never a wonder why he is not slaughtered. All of these interior views were taken on the stage of Mr. Breese's studio, and the stage setting is so carefully arranged, that there is an excellent impression of the shifting scene at an evening reception. One becomes interested in the reappearing characters as they are seen in different relations, just as characters do on the stage. The out-of-door scenes were all photographed out of doors, not from drawings. as one imagines must have been the case when the view is presented of Fifth Avenue with the electric lights glowing.

All these pictures occupy the full width of the stage, and are life-size, so that, after a few scores have been shown, the spectators lose the sense of viewing pictures and fancy the figures real. Indeed, they remain posed no longer than flesh and blood players do, before they change with the action of the story.

A Detachable Guard for Protecting the Mantles Employed in Incandescent Gas Lights.—This (says *Invention*) has recently been invented and patented by Mr. William Duncan, solicitor, of Leith. The guard, we are informed, is guaranteed to prevent the breakage of the mantle, which happens so frequently through the chimney touching the same while being removed or replaced. As the chimney requires cleaning about once a fortnight, and has to be taken off for that purpose, and each mantle costs 1*s.* 3*d.* to replace, the cost of the light soon mounts up, especially where a number of burners is used. The guard is of a very simple character. It is slipped on outside the chimney, and a slight turn fixes it in position. The chimney can then be removed and replaced, and, no matter how carelessly this be done, it is claimed to be impossible to touch the mantle in the operation. Once it is replaced, the guard is removed, and can thus be used for any number of lights. Three designs of the contrivance are made, one for lamps which have an outer globe or at least an outer gallery, one for lamps which use the chimney only, and one for lamps with the "Comet" gallery.

THE "DELOGRAPH" ENLARGING PROCESS.

[E. H. Hardy & Co., Commercial-street, Sheffield.]

The Delograph enlarging and copying system of Messrs. Hardy & Co. necessitates the use of a specially designed easel, which is employed in conjunction with whatever projection method may be used, daylight or artificial light. Primarily, the easel, of course, carries the sensitive surface for receiving the image, but it is fitted with a trough for holding excess of developing solution, and a frame containing the dish, and is so constructed that, when not in use for enlarging purposes, it can be adapted as a retouching desk, being adjustable to the necessary angle, and so admitting of holding a negative, or in like manner of serving as a copying stand.

When used for enlarging purposes, the Delograph is placed in front of a camera in the dark room, and a properly focussed picture of a negative or positive transparency is received upon its ground-glass surface. The previously wetted and expanded bromide paper is then placed in optical contact with the ground-glass easel plate, an exposure well under the normal is given, and, whilst the paper is still in position, the developer is applied by means of a wide, flat camel-hair brush. If, after the lapse of a minute or two, no image appears, then another exposure is given, the lens is covered, and development is proceeded with as before, the paper still remaining *in situ*. The process may be repeated till a satisfactory result ensues.

To enable us to judge of the efficiency of this system, Messrs. Hardy & Co. kindly enlarged several of our own negatives for us. In operation, the bromide paper was damped, then covered with Delographine solution (a non-staining developer), and placed in position on the opal of the easel. The image was then thrown on, and printed itself completely out in from half to one minute, all that remained being to wash and fix.

The negatives enlarged had a considerable variety of density and range of brilliancy, but in all cases the results are exceedingly fine, the more so as only one exposure was made in each case.

The Delograph process is evidently one of great practical value and convenience, especially in the control of the results, while the Delograph easel is a handy accessory, having, as we have pointed out, several uses likely to commend it to professional workers.

The following is the form of certificate which has now to be filled up for the transmission of compressed gases by rail: "To the ——— Railway Company. Conveyance of Compressed Gas by Passenger Train. This is to certify that the cylinder used for this consignment complies with the condition that it must be of wrought iron or steel, of sufficient strength, and efficiently tested. ———, Sender."

The Lantern as an Agent for Advertising.—It is desirable that a lantern picture under all circumstances be illuminated by a light that is steady and reliable, but for advertising purposes this is not so essential as for illustrating lectures; therefore the lamps that are now furnished by different makers can be used satisfactorily for outdoor work. All of the large cities, and most of the small ones in the Western country, have now no other form of light than that given by the electric current, and the companies are inclined to furnish all facilities for placing currents in all positions that may be required. The lamp having been obtained, the only other part needed is the lenses. Any form of box can be used. The four-and-a-half-inch condensing lens is all that is necessary, the double combination being preferable. The heat from the arc lamp is intense, and a plate of glass placed between the carbons and the condensing lens will be likely to save the lens from breakage; it will also serve another good purpose: the carbons are coated with a copper surface, which is melted by the intense heat and is thrown off in particles, which will imbed themselves in the surface of the lens if it is not protected; this intense heat is what makes us advise the use of the doublets in preference to the use of the triplets, as the triple combination by its shorter focus would bring the carbons too close to the lens for safety. A judicious selection of locality for the placement of the lantern and screen is essential to success in this business. It should be in the section of the city or town where travel at night is very great. It is desirable also that the screen be placed upon private property, so that there will be no interference by the authorities. The views that are selected must be of such a character as to be readily comprehended by the audience. Copies of fine paintings, caricatures, and comics are in order, but scenery of distant places that is not likely to be known will be useless. So much for the manipulation of the lantern. The greatest difficulty the lantern man will find in making his bargains with the advertiser will be to get him to put as little as possible on one slide. Naturally his inclination will be to put all the details of the business on it, as he thinks thereby to get more for his money, but he actually gets the contrary. There are only a certain number of words that can be put upon a slide to show distinctly upon the screen, and to go beyond this merely crowds the picture and destroys the object in view. A few words pointedly placed before the reader, telling just what is offered, will attract more attention, and will give a more lasting impression to the mind. A picture in connexion with the advertisement is more desirable, as pictures always attract attention.—*The Exhibitor* (Philadelphia).

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